Life Science CATALOG 2014

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Promega brings more than 35 years' experience delivering reagents to life science researchers to the table when you need a collaborator in advanced technology development, custom assays, or contract manufacturing for research or IVD medical devices.

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Promega 2014 Life Science Catalog

ABOUT THE COVER

Title: Large White Cabbage Butterfly Eggs – II

The Large White (*Pieris brassicae*), also called Cabbage Butterfly, Cabbage White, or in India the Large Cabbage White, is a butterfly in the family Pieridae.

Eggs of the Great White look like extraterrestrial buildings. They protect the embryo caterpillar and are equipped with pores to provide sufficient oxygen.

From: 450.00 CHF

Magnification: 106:1

Promega

Helix

Smart, On-Site Stocking

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– Manager of Research Supply

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1 Biobanking

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Complete Solutions for Biobanking Workflows

Promega solutions are designed to bring automation, efficiency and confidence to your biobanking workflow.

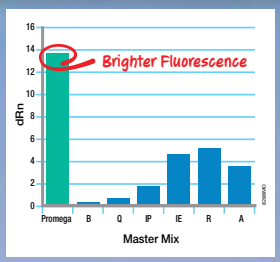
- **Automation:** Instruments and chemistries designed to work together and provide higher throughput and greater reproducibility.
- **Flexibility:** Scalable chemistries and modular instrument installation options adaptable to your biobanking throughput needs.
- **Confidence:** Dependable products provided and supported by a single source helping you achieve an efficient, quality workflow

Biobanking workflow

Extraction

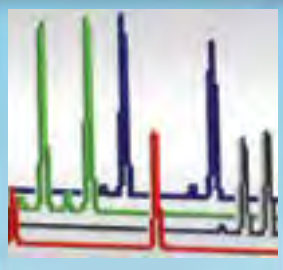
Promega DNA purification chemistries and automation platforms for variable sample sizes and throughput needs.

Quantitation



Fast, sensitive fluorescence and qPCR based Promega assays for accurate quantitation.

Pre-Qualification



Powerful STR systems for sample identification and contamination detection.

Results

Qualified, verified samples ready for storage or shipment.

Promega

Start simplifying your workflow with solutions designed to work together:

www.promega.com/Biobanking

DNA Extraction for Biobanks

ReliaPrep™ 96 gDNA Miniprep HT System

Product	Size	Cat.#
ReliaPrep™ 96 gDNA Miniprep HT System	1 × 96 preps	A2670
	4 × 96 preps	A2671

Available Separately	Size	Conc.	Cat.#
20X TE Buffer (pH 7.5)	25 ml		A2651
Heat Block Adapter	1 each		A2661
RNase A Solution	5 ml	4 mg/ml	A7974
25mM Tris-HCl (pH 8.0)	60 ml		A2641
10mM EDTA (pH 8.0)	10 ml		A2631

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ 96 gDNA Miniprep HT System provides a simple and reliable method for the rapid isolation of gDNA in a multiwell format. gDNA may be purified from blood and Oragene®•Discover sample collection devices. The purified gDNA can be used directly in PCR assays, microarrays and next-generation sequencing applications. The use of paramagnetic particles for DNA capture eliminates the need for centrifugation or vacuum manifolds, making the system suitable for full automation. In addition, the system does not require an organic solvent, making it safe and convenient. DNA yields of up to 12µg are expected from input blood volumes of 350µl, depending on the WBC count of the sample. Saliva samples can have variable amounts of gDNA, and up to 18µg or more of DNA may be recovered from a 700µl Oragene® collection device sample.

Features:

- **Improve Productivity:** Walkaway automation of genomic DNA extraction.
- **Eliminate Sample Rework:** Robust, precipitation-free protocol, no chance of "lost pellets".
- **Simplify Workflow:** High yields of pure DNA from pristine and challenged or hemolysed samples.
- **Reduce Time to Results:** Pure gDNA ready for demanding applications; samples in solution; no resuspension required.

ReliaPrep™ Large Volume HT gDNA Isolation System

Product	Size	Cat.#
ReliaPrep™ Large Volume HT gDNA Isolation System	96 × 10ml to 960 × 1ml preps	A1751
		A2751
HSM 2.0 Instrument	1 each	A2715
Alkaline Protease (APA)	130 ml	A1721
Cell Lysis Buffer (CLD)	1,400 ml	A1731
Binding Buffer (BBA)	1,600 ml	A1741
ReliaPrep™ Resin	115 ml	A1752
Prepared Wash Buffer (WBC)	3,500 ml	A2681
Proteinase K (PK) Solution	23 ml	A5051
Nuclease-Free Water	500 ml	P1197

Available Separately	Size	Conc.	Cat.#
RNase A Solution	5 ml	4 mg/ml	A7974
20X TE Buffer (pH 7.5)	25 ml		A2651
Tissue Lysis Buffer (TLA)	500 ml		A5091
Nuclease-Free Water	1,000 ml		P1199
HSM 2.0 Instrument Cover	1 each		A2712
HSM 2.0 Tube Rack	1 each		A2713
HSM 2.0 Tube Rack Stand	1 each		A2714
HSM 2.0 Instrument 1-Year Service Agreement	1 each		SA1330
ReliaPrep™ LV 32 HSM Standard Service Agreement	1 each		SA3070
Bottle for 50% Ethanol	1 each		A2691

A1751, A7974, A2651, A2751, A2715, A5091, A1721, P1199, A1731, A2712, A1741, A2713, A1752, A2714, A2681, A5051, SA3070, A2691, P1197 For Research Use Only. Not for Use in Diagnostic Procedures. Product may not be available in all countries. Please contact your local representative for more information.

Description: The ReliaPrep™ Large Volume HT gDNA Isolation System isolates genomic DNA (gDNA) from 1–10ml of blood in a scalable format. The chemistry eliminates tedious centrifugation steps as well as the use of hazardous chemicals, which are inherent in precipitation-based chemistries. Each reagent kit provides enough reagents to process up to 96 × 10ml whole blood samples. The system has been automated on robotic liquid-handling workstations, allowing walkaway purification of genomic DNA from 1–10ml of whole blood, regardless of sample storage or shipping conditions. For low-throughput isolation of gDNA from up to 32 samples at one time, the HSM 2.0 can be used in a manual mode, where the user performs the pipetting functions. The HSM has software that controls the instrument and directs the user through the purification protocol.

Features:

- **Decrease Hands-On Time:** Automation reduces operator time spent on instrument setup and takedown by allowing walkaway operation for large numbers of samples at one time.
- **Remove Protocol Bottlenecks:** Heater Shaker Magnet eliminates the need to move samples on the robot deck, reducing instrument failures; precipitation-free chemistry dramatically reduces purification failures.
- **Achieve Peace of Mind:** Automated liquid level sensing with operator notification allows recovery of samples in case of error.
- **Isolate Pure DNA from All Samples:** Purification chemistry is equally effective at recovering DNA from pristine as well as challenged (hemolysed or frozen) samples.
- **Save a Day or Two of Processing:** Samples are eluted in buffer, ready for use in downstream assays or archiving, eliminating resuspension of pelleted DNA, which can take 24–48 hours.
- **Reduce Waste:** Chemistry is automatically scaled for each sample and plastic use is conserved, reducing liquid and solid waste during sample runs.

Storage Conditions: Store at 15–30°C.

Available in the Helix® on-site stocking system

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Maxwell® 16 Instrument for Nucleic Acid and Protein Purification

Product	Size	Cat.#
Maxwell® 16 Instrument	1 each	AS2000
Maxwell® 16 MDx Instrument	1 each	AS3000
Maxwell® 16 Forensic Instrument	1 each	AS3060
Available Separately	**Size**	**Cat.#**
Maxwell® 16 SEV Hardware Kit	1 each	AS1200
Maxwell® 16 Cartridge Rack	1 each	AS1201
Maxwell® 16 Magnetic Elution Rack	1 each	AS1202
Maxwell® 16 LEV Hardware Kit	1 each	AS1250
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Maxwell® 16 LEV Magnet	1 each	AS1261
Thermal Serial Printer and Universal Power Cable	1 each	E2821
UV Bulb, Maxwell® 16	1 each	SP1080

Description: The Maxwell® 16 Instruments provide consistent hands-off, labor-saving automated purification of high-quality DNA, RNA, viral total nucleic acid or recombinant proteins for a broad range of downstream applications. The Maxwell® 16 Instrument can be configured as an SEV Instrument (Standard Elution Volume 200–400µl) for maximum yield or LEV Instrument (Low Elution Volume 30–100µl) for maximum concentration. In addition, SEV and LEV instruments can be configured with the Flexi Method Firmware, allowing the user to program the Maxwell® 16 Instrument to further optimize performance. Your personal automation instrument configuration will be built to order. The Maxwell® 16 Instrument is preprogrammed with purification protocols, which when combined with kits containing prefilled reagent cartridges maximize simplicity and convenience. The instrument processes 1 to 16 samples in approximately 18–50 minutes (depending on sample type).

The Maxwell® 16 Instrument extracts DNA, RNA, viral total nucleic acid or recombinant proteins using paramagnetic particles, allowing optimal capture, washing and elution of the target material. Add samples or lysate directly to the prefilled reagent cartridges, and press start. Optimized reagent systems and automated methods are provided to purify from specified sample types to deliver maximum quality for downstream applications.

The Maxwell® 16 Instrument includes a 1-year basic warranty. Service programs are offered to extend coverage. If during the extended warranty period the instrument needs repair under normal use, Promega will be responsible for the repair. Service programs offer similar terms with the addition of the use of a temporary replacement instrument during the instrument repair period. Please contact Promega for complete warranty and service terms and limits.

Features:

- **Recover Lost Time and Labor:** Automation gives you back your time and labor to complete your work.
- **Gain Confidence in Your Results:** Instrument design, optimized reagents and automated methods provide consistent yield and purity.
- **Improve Your Productivity:** Process up to 16 samples per instrument run in approximately 30–45 minutes.
- **Choose Your Sample Type:** Flexibility to purify from tissue, cells, blood and other samples.

Storage Conditions: Store at 22–25°C.

Maxwell® 16 Instrument (Cat.# AS2000).

Maxwell® 16 Instrument (Cat.# AS3000) with optional bar code reader.

Maxwell® 16 System DNA Purification Kits

Product	Size	Cat.#	
Low Elution Volume (LEV)			
Maxwell® 16 LEV Blood DNA Kit	48 preps	AS1290	
Maxwell® 16 FFPE Plus LEV DNA Purification Kit	48 preps	AS1135	
Maxwell® 16 Cell LEV DNA Purification Kit	48 preps	AS1140	
Maxwell® 16 Buccal Swab LEV DNA Purification Kit	48 preps	AS1295	
Maxwell® 16 Viral Total Nucleic Acid Purification System	48 preps	AS1155	308
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit	48 preps	AS1130	
Standard Elution Volume (SEV)			
Maxwell® 16 Blood DNA Purification Kit	48 preps	AS1010	
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015	301
Maxwell® 16 Cell DNA Purification Kit	48 preps	AS1020	
Maxwell® 16 Tissue DNA Purification Kit	48 preps	AS1030	
Maxwell® 16 Mouse Tail DNA Purification Kit	48 preps	AS1120	
Available Separately			
LEV Plungers	50 /pk	AS6101	
Elution Tubes (LEV)	50 /pk	AS6201	
Microtubes, 1.5ml	1,000 /bag	V1231	
ClickFit Microtube, 1.5ml	1,000 /pack	V4741	
Elution Buffer, Blood	45 ml	MD1421	
Plungers (SEV)	50 /pk	AS5201	
Elution Tubes (SEV)	50 /pk	AS5101	

AS1290, AS1135, AS1140, AS1295, AS1150, AS1010, AS1020, AS1030, AS1120 For Laboratory Use. AS2000, AS3000, AS6101, AS6201, V1231, V4741, MD1421, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures. AS1015, AS1155 For In Vitro Diagnostics Use. This product is only available in certain countries.

Wizard® Genomic DNA Purification Kit

Product		Size	Conc.	Cat.#
Wizard® Genomic DNA Purification Kit	100 isolations × 300 µl			A1120
	500 isolations × 300 µl			A1125
	100 isolations × 10 ml			A1620
Available Separately		**Size**	**Conc.**	**Cat.#**
Cell Lysis Solution (Genomic Purification)		1 liter		A7933
Nuclei Lysis Solution		50 ml		A7941
		1 liter		A7943
Protein Precipitation Solution		25 ml		A7951
		350 ml		A7953
DNA Rehydration Solution		50 ml		A7963
RNase A Solution		1 ml	4 mg/ml	A7973
Proteinase K		100 mg		V3021

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Description: The Wizard® Genomic DNA Purification Kit provides a simple, solution-based method for isolation of DNA from white blood cells, tissue culture cells, animal tissue, plant tissue, yeast and Gram-positive and Gram-negative bacteria. DNA purified with this system is suitable for a variety of applications, including amplification, digestion with restriction endonucleases and membrane hybridizations (e.g., Southern and dot/slot blots).

Features:

- **Improved Productivity:** Rapidly isolate genomic DNA from blood, tissue culture, animal and plant cells, bacteria and yeast in approximately 60 minutes.
- **Scalability:** Reagent volumes can be adjusted to correspond to the amount of material to be processed.
- **Flexibility:** Genomic DNA purified from a variety of sample types is suitable for a variety of applications.
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

DNA Yields from Various Starting Materials Using the Wizard® Genomic DNA Purification Kit.

Source	Amount of Starting Material	Typical DNA Yield
Whole Blood	300µl	5–15µg
	1ml	25–50µg
	10ml	250–500µg
	96-well plate, 50µl/well	0.2–0.7µg
Tissue Culture Cells	10^6–10^7 cells	5–30µg
Animal Tissue		
Mouse Liver	11mg	15–20µg
Mouse Tail	0.5–1cm of tail	10–30µg
Insect Cells	5×10^6 cells	16µg
Plant Leaf Tissue	40mg	7–12µg
Bacterial Culture*	10^8–10^{10} cells	5–20µg
Yeast*	1.9×10^8 cells	4.5–6.5µg

*Overnight culture.

9483LA

Wizard® SV 96 Genomic DNA Purification System

Product		Size	Conc.	Cat.#
Wizard® SV 96 Genomic DNA Purification System	1 × 96 preps			A2370
Wizard® SV 96 Genomic DNA Purification System	4 × 96 preps			A2371
Available Separately		**Size**	**Conc.**	**Cat.#**
Wizard® SV Lysis Buffer		50 ml		Z3052
Column Wash Solution (CWA)		185 ml		A1311
Nuclei Lysis Solution		50 ml		A7941
EDTA, 0.5M (pH 8.0), Molecular Biology Grade		100 ml		V4231
RNase A Solution		1 ml	4 mg/ml	A7973
Wizard® SV 96 Binding Plates		10 pack		A2271

A2370, A6782, Z3052, A2371, A6780, A7941, V4231, A6784, A7973, A2271 For Research Use Only. Not for Use in Diagnostic Procedures. A1311 For Laboratory Use.

Description: The Wizard® SV 96 Genomic DNA Purification System provides a high-throughput, membrane-based technique for consistent preparation of genomic DNA from cultured cells and tissue, including mouse tails. Amplifiable genomic DNA can be isolated from up to 5×10^6 cells, 20mg of tissue or up to 1.2cm of a mouse tail tip without a centrifugation clearing step.

With the Wizard® SV Genomic DNA purification system, genomic DNA is purified from cell lysates using 96-well vacuum filtration. Washing the bound DNA requires no disassembly of the manifold, and filtrate waste products are delivered directly to a vacuum trap, eliminating the need to empty waste collection trays.

The Wizard® SV Genomic DNA Purification System is designed for use either in a manual format or with Beckman Coulter or PerkinElmer automated instruments.

Features:

- **Improve Productivity:** Obtain genomic DNA from mouse tails in 45–60 minutes, genomic DNA from cultured cells in 30 minutes. No spins required.
- **Achieve High Yield:** Purify 20–30µg of DNA per prep from 1.2cm of mouse tail.
- **Gain Confidence in Applications:** Purified DNA ready for amplification.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

DNA and RNA Quantitation

QuantiFluor® dsDNA System

Product	Size	Cat.#
QuantiFluor® dsDNA System	1 ml	E2670

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® dsDNA System contains a fluorescent DNA-binding dye that enables sensitive quantitation of small amounts of double-stranded DNA (dsDNA) in solution. The quantitation of dsDNA is a very important step in many biological applications, particularly in standard molecular biology techniques. The dye shows minimal binding to single stranded DNA (ssDNA) and RNA, allowing specific quantitation of dsDNA.

Features:

- **Specificity:** Highly specific to dsDNA, minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for low-concentration samples. Performs better or equal to PicoGreen® dye and can detect as little as 50pg/ml.
- **Ease of Use:** System includes all required reagents to quickly set up and quantitate dsDNA.
- **Instrument Compatibility:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.

Storage Conditions: Store at 4°C.

QuantiFluor® ssDNA System

Product	Size	Cat.#
QuantiFluor® ssDNA System	1 ml	E3190

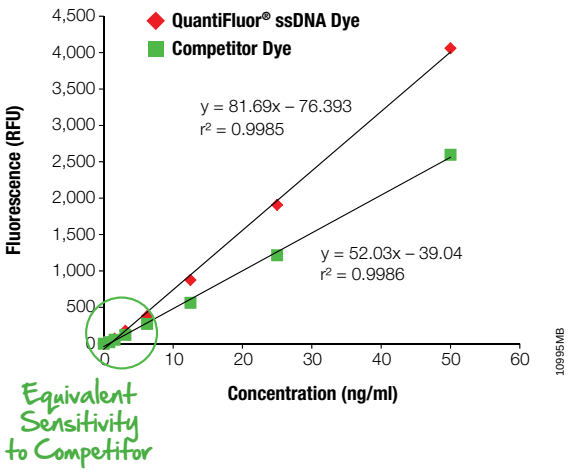
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® ssDNA System contains a fluorescent dye that enables sensitive quantitation of small amounts of single-stranded (ssDNA) in solution. Detecting and quantitating ssDNA is useful for a variety of research interests in molecular biology. These include studying ssDNA viruses, quantitating short synthetic ssDNA probes for site-directed mutagenesis, analysis of first-strand cDNAs and quantitating bisulfite-converted DNA to study DNA methylation.

Features:

- **Increase your Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for those samples that are low in concentration.
- **Save Precious Sample for Downstream Assays:** Less template DNA required than spectrophotometry.
- **Set Up Quickly and Easily:** System includes all the necessary reagents to quickly set up and quantitate ssDNA.
- **Experience Flexible Instrument Compatibility:** Sets up easily on both the QuantiFluor® Fluorometer and GloMax®-Multi Instrument. This system also can be used on any fluorescent instrument with appropriate optical channels.
- **Remain Cost-Effective:** Value priced for those customers who are cost-conscious and budget-constrained.
- **Instrument Compatibility:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.

Storage Conditions: Store at –30° to –10°C, protected from light.



The QuantiFluor® ssDNA System will detect ssDNA as little as 1ng/ml (200pg per well) in a 96-well microplate (200ml total volume). Detection limit is defined as greater than three standard deviations above the background RFU.

QuantiFluor® RNA System

Product	Size	Cat.#
QuantiFluor® RNA System	1 ml	E3310

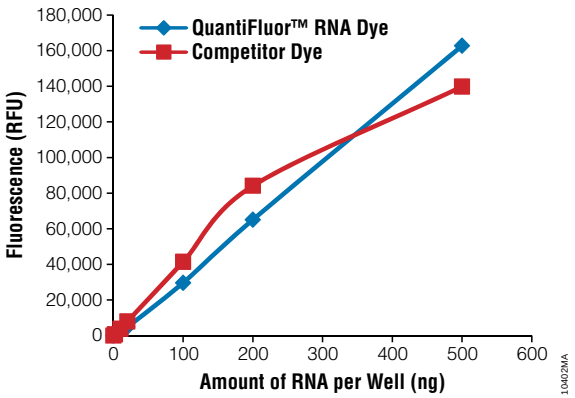
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sensitive quantitation of RNA is important for the success of downstream applications. The QuantiFluor® RNA System contains a fluorescent RNA-binding dye that enables sensitive quantitation of small amounts of RNA in solution. Detecting and quantitating small amounts of RNA is a very important step that is used in many biological applications, particularly in molecular biology techniques.

Features:

- **Highly Sensitive:** Significantly increased sensitivity over NanoDrop® spectrophotometer, especially for low-concentration samples.
- **Save Precious Sample for Downstream Assays:** Less template RNA required than for quantification by spectrophotometry.
- **Flexible:** Compatible with both QuantiFluor®-ST and GloMax®-Multi Instruments and other fluorometers with appropriate optical channels.
- **Cost-Effective:** Value priced, robust option for RNA quantitation.
- **Instrument Compatibility:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Instrument.

Storage Conditions: Store at –30°C to –10°C, protected from light.



Standard curves using the QuantiFluor® RNA Dye and a competitor dye. The standard curves were generated using RNA Standard in a 96-well format and 200µl total volume as described in Section 5 of the Technical Manual. The standard curve RNA amounts are 2ng, 10ng, 20ng, 50ng, 100ng, 200ng and 500ng per well. Fluorescence was measured using the GloMax®-Multi+ Detection System. The fluorescence values shown were blank-subtracted. Under these conditions, the dynamic range for the QuantiFluor® RNA Dye is approximately 2–500ng per well (in 200µl total volume), and the QuantiFluor® RNA Dye limit of detection is approximately 100pg per well.

Quantus™ Fluorometer

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ Fluorometer is a dual-channel fluorometer for your personal quantitation workflow. Designed to provide highly sensitive fluorescent detection when quantifying nucleic acids, the compact instrument is simple to operate. The Quantus™ Fluorometer is optimized with pre-programmed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA and ssDNA Systems) for nucleic acid quantitation, and allows users the flexibility to create their own methods and quantitation settings for other dyes.

The Quantus™ Fluorometer is equipped with two fluorescence channels for nucleic acid and protein quantitation:

- Blue fluorescence channel: Excitation 495nm shortpass (wavelengths up to 495nm), emission 510–580nm.
- Red fluorescence channel: Excitation 640nm shortpass (wavelengths up to 640nm), emission 660–720nm.

Features:

- **High Performance:** Integrated with QuantiFluor® Dyes for high sensitivity, broad dynamic range and target specificity. Great for low-level sample quantitation such as FFPE or viral samples.
- **Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop®) for those samples that are low in concentration. Ten times more sensitive than Qubit® 2.0. A detection limit of 50pg/ml, compared to 500pg/ml for the Qubit® 2.0. With a customized low standard curve, the detection limit can read as low as 1pg/ml.
- **Easy-to-Use Workflow and Navigation:** Flexible with custom protocols and user-defined settings. PC software for data management workflow.
- **Affordable Price:** Cost-effective to easily incorporate into your laboratory.

Quantus™ Fluorometer.

QuantiFluor® Single-Tube Fluorometers

Product	Size	Cat.#
QuantiFluor®-ST Handheld Fluorometer with UV/Blue Channels	1 each	E6090
QuantiFluor®-P Handheld Fluorometer with Green/Blue Channels	1 each	E6100
QuantiFluor®-P Handheld Fluorometer with UV/Blue Channels	1 each	E6105

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For additional information see page 245.

Available in the Helix® on-site stocking system

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Plexor® HY System

Product	Size	Cat.#
Plexor® HY System	200 reactions	DC1001
	800 reactions	DC1000
Available Separately	**Size**	**Cat.#**
Plexor® Calibration Kit, Set A	1 each	DC1500
Water, Amplification Grade	6,250 µl	DW0991

Not For Medical Diagnostic Use.

Description: The Plexor® HY System is a real-time PCR assay to determine the concentration of total human DNA and male human DNA simultaneously in one reaction. The kit contains an internal PCR control (IPC) to test for false-negative results that may occur in the presence of PCR inhibitors and a melt curve function to confirm that the correct product was amplified.

Plexor® HY is a sensitive multiplex kit that routinely detects approximately 6.4pg of total DNA. PCR setup is performed at room temperature and is compatible with automated platforms.

The Plexor® Systems work by measuring a reduction in fluorescent signal during amplification. Amplification of each target uses only two primers, one of which contains both a fluorescent tag and a modified base. As amplification proceeds, fluorescence is reduced by site-specific incorporation of a fluorescent quencher opposite the complementary modified base. The quencher is in close proximity to a fluorescent dye located on the end of the primer, resulting in a reduction of fluorescent signal. After PCR, a melt analysis can be performed to provide an internal control for the final assay design or to expedite troubleshooting.

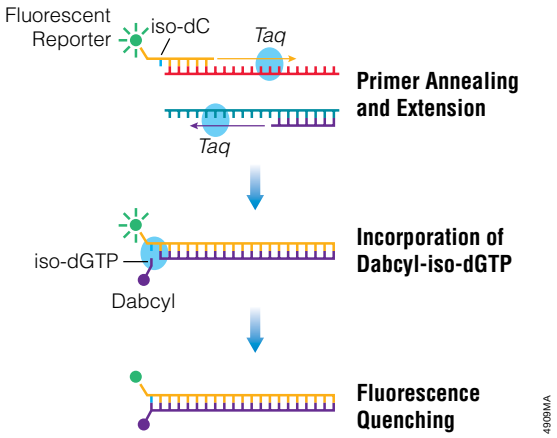
The Plexor® HY System is optimized for use on the Applied Biosystems 7500 and 7500 FAST real-time PCR systems and Stratagene Mx3005P® and Mx3000P® qPCR systems. For information about use with other qPCR instrumentation, contact Promega Technical Services.

The Plexor® Analysis Software is available for free download. The unique functions of this software allow you to quickly and easily review data and create reports. Replicate samples are automatically averaged, template amounts are calculated and the necessary volume of DNA is displayed for your optimized STR amplification conditions.

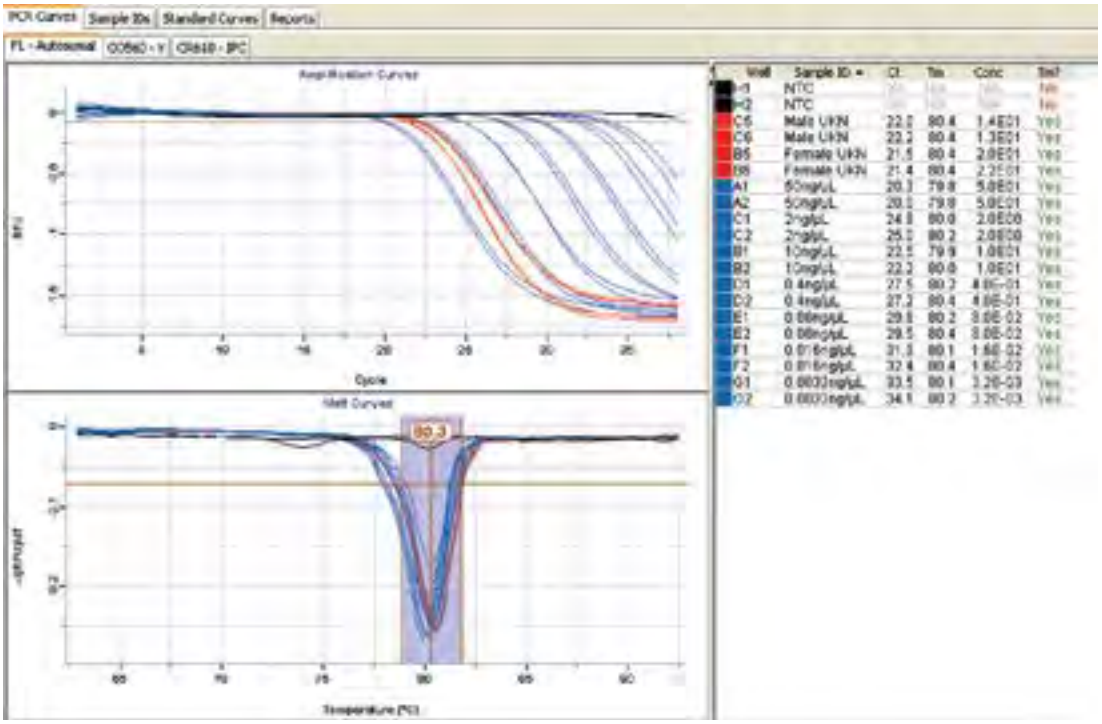
Features:

- **Simultaneous Quantification of Autosomal and Y-Chromosome DNA:** Less variability, less time, more valuable data.
- **Consistent and Reproducible Detection of 6.4pg of DNA:** If you can't detect it with Plexor® HY, you can't detect it with your STR system.
- **Internal Positive Control and Melt-Curve Analysis:** Guard against false-negative and false-positive results, allowing you to be confident in your data.

Storage Conditions: Store at –20°C.



Schematic diagram illustrating the Plexor® real-time PCR process.



Autosomal amplification curves and melt curves from a Plexor® HY amplification.

Sample ID and Mixed Sample Detection

PowerPlex® 21 System

Product	Size	Cat.#
PowerPlex® 21 System	200 reactions	DC8902
	4 × 200 reactions	DC8942
Available Separately	**Size**	**Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251

Not For Medical Diagnostic Use.

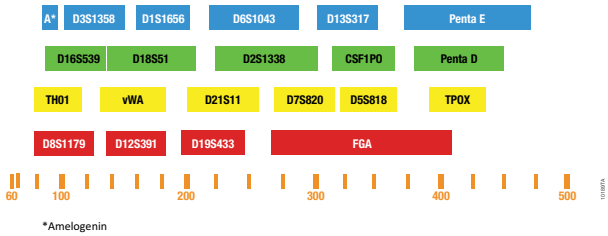
Description: The PowerPlex® 21 System is a multiplex STR system for human identification applications including forensic analysis, relationship testing and research use. The system allows co-amplification and fluorescent detection of 21 loci (20 STR loci and Amelogenin), including D1S1656, D2S1338, D3S1358, D5S818, D6S1043, D7S820, D8S1179, D12S391, D13S317, D16S539, D18S51, D19S433, D21S11, Amelogenin, CSF1PO, FGA, Penta D, Penta E, TH01, TPOX and vWA. The PowerPlex® 21 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Features:

- **21 Markers:** Enjoy maximum discrimination for difficult cases and complete data overlap with most existing multiplexes.
- **Direct-Amplification Compatibility:** Save labor and time by removing the need to wash FTA® card punches. Simpler protocols are available for swabs and nonFTA card punches as well.
- **High Inhibitor Tolerance:** Experience higher success rates with challenging casework samples including less locus drop-out and reaction failure.
- **90-Minute PCR:** Shorten PCR time by 1–2.5 hours, increasing laboratory productivity and decreasing average turnaround time for your cases.

Storage Conditions: Store kit at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.



Configuration of the PowerPlex® 21 System. The PowerPlex® 21 System contains all 13 CODIS loci.

PowerPlex® 16 HS System

Product	Size	Cat.#
PowerPlex® 16 HS System	100 reactions	DC2101
	400 reactions	DC2100
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
9947A DNA	250 ng	10 ng/µl	DD1001

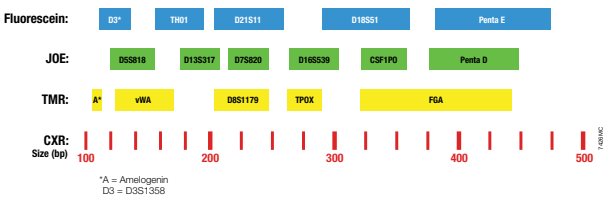
DC2101, DC2100, DW0991, DD7101, DD7251, DD1001 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The PowerPlex® 16 HS System is a multiplex STR system for use in DNA typing. This system co-amplifies the loci D18S51, D21S11, TH01, D3S1358, Penta E (labeled with fluorescein); FGA, TPOX, D8S1179, vWA and Amelogenin (labeled with TMR); CSF1PO, D16S539, D7S820, D13S317, D5S818 and Penta D (labeled with JOE). This multiplex includes all 13 CODIS STR markers, Amelogenin for gender determination and two low-stutter, highly discriminating pentanucleotide STR markers. All sixteen loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® 16 HS System is compatible with ABI PRISM® 310, 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Features:

- **Robustness:** The PowerPlex® 16 HS System is more tolerant of PCR inhibitors than competing STR systems and the previous version of the PowerPlex® 16 System. Generate profiles with samples that previously failed to amplify. Avoid costly and time-consuming sample cleanup.
- **Sensitivity:** Each lot is quality tested to produce full profiles from 100pg of DNA. Gain confidence in analysis of limited samples.
- **High Discrimination:** The loci included in PowerPlex® 16 HS are more discriminating than competitive systems and are ideal for resolving partial matches or challenging familial cases.
- **Proven Design:** Primer sequences, dyes and ladders are all unchanged from PowerPlex® 16. Expect concordance with existing databases.
- **Complete System:** PowerPlex® 16 HS includes size standard, amplification-grade water and *Taq* DNA polymerase already in the master mix. Simple to order, easy to use.
- **Automatic Assignment of Genotypes:** Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Storage Conditions: Store at –20°C.



Configuration of the PowerPlex® 16 HS System. The PowerPlex® 16 HS System contains all 13 CODIS loci.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

PowerPlex® 18D System

Product	Size	Cat.#
PowerPlex® 18D System	200 reactions	DC1802
	800 reactions	DC1808
Available Separately	**Size**	**Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

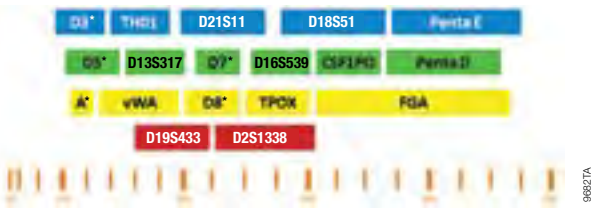
Description: The PowerPlex® 18D System is a multiplex STR system for use in database and paternity testing. This system is optimized for direct amplification of samples on FTA® cards. This five-color multiplex allows co-amplification of the 13 CODIS loci (D18S51, D21S11, TH01, D3S1358, FGA, TPOX, D8S1179, vWA, CSF1PO, D16S539, D7S820, D13S317, D5S818) plus Amelogenin, Penta E, Penta D, D2S1338 and D19S433. All eighteen loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® 18D System is compatible with ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

The PowerPlex® 18D System was given NDIS approval in July 2011 for NDIS CODIS databasing.

Features:

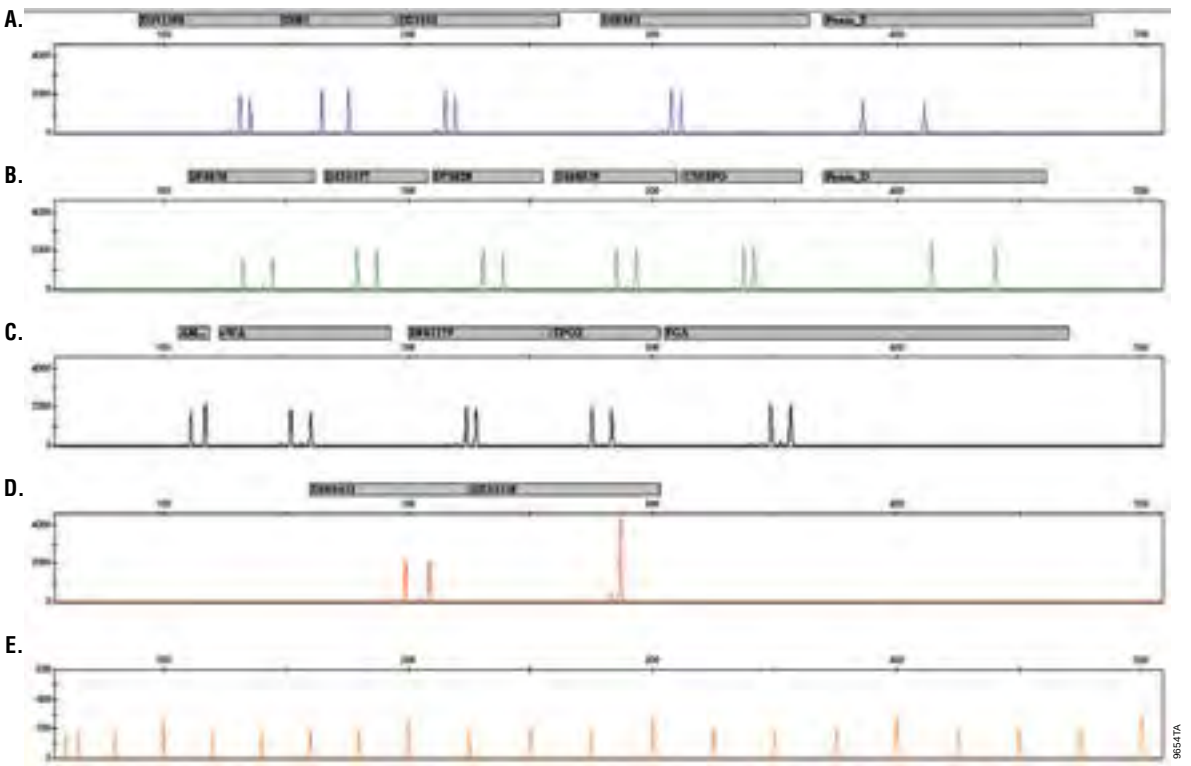
- **Eliminate DNA Extraction:** Simplify and shorten sample processing with direct amplification from FTA® cards.
- **Reduce PCR Time:** Amplify in less than 1.5 hours using rapid cycling technology.
- **Upload More Markers:** Type D2S1338, D19S433, Penta D, Penta E, Amelogenin and the 13 CODIS loci with one kit.
- **Automatically Assign Genotypes:** Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Storage Conditions: Store kit at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.



*A = Amelogenin, D3 = D3S1358, D5 = D5S818, D7 = D7S820, D8 = D8S1179

Configuration of the PowerPlex® 18D System. The PowerPlex® 18D System contains all 13 CODIS loci: D3S1358, TH01, D21S11, D18S51, D5S818, D13S317, D7S820, D16S539, CSF1PO, vWA, D8S1179, TPOX and FGA, plus Amelogenin, Penta E, Penta D, D19S433 and D2S1338.



Amplification of sample using the PowerPlex® 18D System. Two 1.2mm punches were taken from a buccal sample transferred to an FTA® card and amplified for 27 cycles using the PowerPlex® 18D System. Amplification products were mixed with CC5 Internal Lane Standard 500 and analyzed with an Applied Biosystems 3130xl Genetic Analyzer using a 3kV, 5-second injection. Results were analyzed using GeneMapper® ID software, version 3.2.

2 Biochemicals and Labware

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Biochemical Buffers and Reagents

4-CORE® Buffer Pack

Product	Size	Cat.#
4-CORE® Buffer Pack (Buffers A, B, C and D), 1ml each	4 ml	R9921

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 122.

5M Sodium Chloride, Molecular Biology Grade

Product	Size	Conc.	Cat.#
5M Sodium Chloride, Molecular Biology Grade	1 L	5 M	V4221

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: 5M Sodium Chloride is commonly used in many molecular biology and forensic applications.

Form: Clear, colorless liquid.

Composition: 292.2g/L NaCl in deionized water.

Properties:

- pH at 25°C (1M): 5.0–8.0.
- A_{260} at 5M: ≤0.02.
- A_{280} at 5M: ≤0.01.
- Conductivity at 25°C (0.05M): 5,000–7,000µSm.

Features:

- **Quality Tested:** Each lot of NaCl is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Acrylamide, Molecular Grade

Product	Size	Cat.#
Acrylamide, Molecular Grade	100 g	V3111
	500 g	V3115

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Acrylamide, Molecular Grade, is used for the electrophoretic separation of nucleic acids and proteins. Very small DNA fragments, such as those generated by sequencing reactions, can be resolved by polyacrylamide gel electrophoresis. Proteins can be separated by a variety of techniques, including denaturing gel electrophoresis using SDS or urea, isoelectric focusing and native gel electrophoresis in a wide variety of buffers.

Formula Weight: 71.08.

Form: White, free-flowing crystals.

Properties:

- **Purity:** ≥99.9%.
- **Melting Point:** 84–86°C.
- **Free Acrylic Acid:** <0.001%.
- **Iron:** ≤1ppm.
- **Lead:** ≤1ppm.
- **pH (10% in 0.1M NaCl at 25°C):** 6.0–7.0.
- **Conductivity (40% in water):** ≤2.5µmhos.

Features:

- **Quality Tested:** Each lot of Molecular Grade Acrylamide is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C. Protect from moisture.

Agarose, LE, Analytical Grade

Product	Size	Cat.#
Agarose, LE, Analytical Grade	100 g	V3121
	500 g	V3125

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Agarose, LE, Analytical Grade, is used for the electrophoretic separation of nucleic acids.

Form: White powder.

Properties:

- **Gel Strength (1%):** ≥1,000g/cm^2.
- **Gelling Point (1.5%):** 36–39°C.
- **Melting Point (1.5%):** 87–89°C.
- **EEO (–mr):** 0.09–0.13.
- **Sulfate:** ≤0.14%.
- **Moisture:** ≤7.0%.

Features:

- **Quality Tested:** Each lot of Analytical Grade LE Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 22–25°C.

Agarose, LMP, Preparative Grade for Large Fragments (>1,000bp)

Product	Size	Cat.#
Agarose, LMP, Preparative Grade for Large Fragments (>1,000bp)	25 g	V2831

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Agarose, LMP, Preparative Grade for Large Fragments (>1,000bp), is a premium agarose used for isolating DNA fragments larger than 1,000bp. Each lot is tested and certified for the following applications: 1) restriction digestion, 2) ligation and transformation, and 3) random prime labeling. LMP = low melting point (i.e., ≤65°C).

Form: White powder.

Properties:

- **Gelling Point (1.5%):** 26–30°C.
- **Melting Point (1.5%):** ≤65°C.
- **Sulfate:** ≤0.10%.
- **EEO (–mr):** ≤0.10.
- **Moisture:** ≤10%.
- **Gel Strength (1%):** ≥200g/cm^2.

Features:

- **Quality Tested:** Each lot of Preparative Grade LMP Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 22–25°C.

Agarose, LMP, Preparative Grade for Small Fragments (10 to 1,000bp)

Product	Size	Cat.#
Agarose, LMP, Preparative Grade for Small Fragments (10 to 1,000bp)	25 g	V3841

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Agarose, LMP, Preparative Grade for Small Fragments (10 to 1,000bp), is a premium agarose used for isolating DNA fragments from 10 to 1,000bp. The isolated DNA fragments can be used in various molecular biology applications: 1) restriction digestion, 2) ligation and transformation, and 3) random prime labeling. LMP = low melting point (i.e., ≤65°C).

Form: White powder.

Properties:

- **Gelling Point (4%):** ≤35°C.
- **Melting Point (4%):** ≤65°C.
- **Sulfate:** ≤0.15%.
- **EEO (–mr):** ≤0.15.
- **Moisture:** ≤10%.
- **Gel Strength:** ≥500g/cm^2.

Features:

- **Quality Tested:** Each lot of Preparative Grade LMP Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 22–25°C.

Agarose, Low Melting Point, Analytical Grade

Product	Size	Cat.#
Agarose, Low Melting Point, Analytical Grade	25 g	V2111

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Agarose, Low Melting Point, Analytical Grade, is ideal for applications that require recovery of intact DNA fragments after gel electrophoresis.

Form: White powder.

Properties:

- **Gelling Point (1.5%):** 24–28°C.
- **Melting Point (1.5%):** ≤65.5°C.
- **Sulfate:** ≤0.12%.
- **EEO (–mr):** ≤0.11.
- **Gel Strength (1%):** ≥300g/cm^2.

Features:

- **Quality Tested:** Each lot of Analytical Grade LMP Agarose is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 22–25°C.

Ammonium Persulfate, Molecular Grade

Product	Size	Cat.#
Ammonium Persulfate, Molecular Grade	25 g	V3131

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Ammonium Persulfate, Molecular Grade, is an oxidizing agent that promotes the polymerization of acrylamide gels.

Formula Weight: 228.20.

Form: White, free-flowing crystals.

Properties:

- **Purity:** ≥98%.
- **Insolubles:** ≤0.005%.
- **Chloride and Chlorate:** ≤10ppm.
- **Lead:** ≤50ppm.
- **Iron:** ≤10ppm.
- **Manganese:** ≤0.5ppm.
- **Residue After Ignition:** ≤0.05%.
- **Moisture:** ≤1.0%.
- **Titratable Free Acid:** ≤0.04meq/g.

Features:

- **Quality Tested:** Each lot of Ammonium Persulfate is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C. Protect from moisture.

Ammonium Sulfate, Molecular Biology Grade

Product	Size	Cat.#
Ammonium Sulfate, Molecular Biology Grade	5 kg	H5252

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Ammonium Sulfate, Molecular Biology Grade, is a salt used in the purification of enzymes and other proteins by precipitation.

Formula Weight: 132.13.

Properties:

- **Purity:** ≥99.0%.
- **Chloride:** ≤5ppm.
- **Copper:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Zinc:** ≤5ppm.
- **Lead:** ≤5ppm.
- **pH at 25°C (1M):** 5.0–6.0.
- **A_{260} at 1M:** ≤0.03.
- **A_{280} at 1M:** ≤0.03.

Features:

- **Quality Tested:** Each lot of Ammonium Sulfate is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Antibiotic G-418 Sulfate

Product	Size	Cat.#
Antibiotic G-418 Sulfate	5 g	V7983
Antibiotic G-418 Sulfate Solution	20 ml	V8091

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Antibiotic G-418 Sulfate is an aminoglycosidic antibiotic toxic to both prokaryotic and eukaryotic cells. It acts by interfering with protein synthesis and is used as an agent for selection of cultured cells expressing a gene (i.e., aminoglycoside 3´ phosphotransferase [APH 3']) that confers resistance to G-418. The liquid form of the product is in distilled water and aseptically filtered.

Formula Weight: 692.6 (anhydrous).

Form: White powder.

Physical/Chemical Properties of Powder:

- **Appearance:** White powder.
- **TLC:** Single major spot.
- **Elemental Analysis:** %C = 28.8–36.07; %H = 5.76–7.76; %N = 6.72–8.41.
- **Absorbance:** A_{280} (1mg/ml) = 0–0.015; A_{570} (100mg/ml) = 0–0.1.
- **Specific Rotation:** +104° to +121°.

Properties Specific to V7983:

- **Appearance:** White powder.
- **Hydration Waters:** 0–6, as determined from Elemental Analysis.
- **Potency:** ≥700µg/mg.

Properties Specific to V8091:

- **Potency:** 40–60mg/ml.
- **Sterility:** Aseptically filtered.

Features:

- **Sterile:** Antibiotic G-418 Sulfate Solution is quality tested for sterility.

Storage Conditions: Store powder at 22–25°C. Store liquid at –20°C.

BCIP/NBT Color Development Substrate (5-bromo-4-chloro-3-indolyl-phosphate/ nitro blue tetrazolium)

Product	Size	Cat.#
BCIP/NBT Color Development Substrate	1.25/2.5 ml	S3771

For Laboratory Use.

Description: BCIP (5-bromo-4-chloro-3-indolyl-phosphate) is used in conjunction with NBT (nitro blue tetrazolium) for the colorimetric detection of alkaline phosphatase activity. Each vial of BCIP is supplied with a vial of NBT.

Preparation of Substrates to Detect Alkaline Phosphatase: For every 5ml of alkaline phosphatase buffer (100mM Tris-HCl [pH 9.0], 150mM NaCl, 1mM $MgCl_2$), add 33µl NBT and 16.5µl BCIP. Add the NBT first, mix, add the BCIP, and mix again. Use within 1 hour, and discard any unused solution.

Concentration: BCIP (50mg/ml) in 100% dimethylformamide; NBT (50mg/ml) in 70% dimethylformamide.

Features:

- **Quality Tested:** Each lot of BCIP/NBT Color Development Substrate is tested and qualified for use in blotting.

Storage Conditions: Store at either 4°C or –20°C.

Beetle Luciferin, Potassium Salt

Product	Size	Cat.#
Beetle Luciferin, Potassium Salt	5 mg	E1601
	1 g	E1605
	50 mg	E1602
	250 mg	E1603

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase genes from the North American firefly (*Photinus pyralis*) and from other beetles are commonly used as reporter genes for studying transcription regulation in transient assay systems and as markers for stably transformed eukaryotic cells. Beetle luciferin (also known as D-luciferin) is synthesized as the monopotassium salt and is a substrate for the beetle luciferase reporter systems. D-luciferin is provided for those researchers who prefer to formulate their own assay reagents for monitoring in vitro or in vivo luciferase activity.

Formula: $C_{11}H_7N_2O_3S_2{\bullet}K$.

Formula Weight: 318.4 (anhydrous).

Features:

- **Formulation:** Supplied as a potassium salt for easy preparation in aqueous buffer.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C.

Bisacrylamide, Molecular Grade (N,N´-Methylenebisacrylamide)

Product	Size	Cat.#
Bisacrylamide, Molecular Grade	25 g	V3141
	125 g	V3143

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Bisacrylamide, Molecular Grade, is a cross-linking agent used in the preparation of polyacrylamide gels. This product is tested for its efficiency in gel polymerization.

Formula Weight: 154.20.

Form: White, free-flowing crystals.

Properties:

- **Purity:** ≥99.0%.
- **Acrylic Acid (CH_2:CHCOOH):** ≤0.001%.
- **A_{290} (1% solution):** ≤0.20.
- **Magnesium:** ≤2ppm.
- **Conductivity (2% in water):** ≤10µmhos.

Features:

- **Quality Tested:** Each lot of Bisacrylamide is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Blue/Orange Loading Dye, 6X

Product	Size	Cat.#
Blue/Orange Loading Dye, 6X	3 ml	G1881

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Blue/Orange Loading Dye, 6X, is a convenient marker dye containing 0.4% orange G, 0.03% bromophenol blue, 0.03% xylene cyanol FF, 15% Ficoll® 400, 10mM Tris-HCl (pH 7.5) and 50mM EDTA (pH 8.0). It is provided in a premixed, ready-to-use form. The dye is used for loading DNA samples into gel electrophoresis wells and tracking migration during electrophoresis. In a 0.5–1.4% agarose gel in 0.5X TBE, xylene cyanol FF migrates at approximately 4kb, bromophenol blue at approximately 300bp and orange G at approximately 50bp.

Features:

- **Quality Tested:** Each lot of Blue/Orange Loading Dye, 6X, is tested and certified to be free of nuclease activity.

Storage Conditions: Store at –20°C.

Boric Acid, Molecular Biology Grade (orthoboric acid)

Product	Size	Cat.#
Boric Acid, Molecular Biology Grade	500 g	H5001
	1 kg	H5003

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Boric Acid, Molecular Biology Grade, in conjunction with Tris, is commonly used in buffers for the preparation of agarose or acrylamide gels and their associated running buffers.

Formula Weight: 61.84.

Properties:

- **Purity:** ≥99.5%.
- **Iron:** ≤5ppm.
- **Lead:** ≤5ppm.
- **Moisture:** ≤0.5%.
- **A_{260} at 1M:** ≤0.015.
- **A_{280} at 1M:** ≤0.010.

Features:

- **Quality Tested:** Each lot of Boric Acid is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Bovine Serum Albumin, Acetylated

Product	Size	Conc.	Cat.#
Bovine Serum Albumin, Acetylated	1 ml	10 mg/ml	R3961
	400 µl	1 µg/µl	R9461

R3961 For Laboratory Use. R9461 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Bovine Serum Albumin, Acetylated, can be used as an enzyme stabilizer or as a carrier protein. It is prepared by a modification of the method of Gonzalez *et al.* and dialyzed extensively with deionized water to remove impurities.

Features:

- **Quality Tested:** Each lot of BSA is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at –20°C.

Coelenterazines

Product	Size	Cat.#
Coelenterazine	250 µg	S2001
Coelenterazine-h	250 µg	S2011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferases from *Renilla*, *Aequorea* and other marine organisms are commonly used as indicators or reporters for studying cellular phenomena in expression assays in eukaryotic cells. *Renilla* luciferase is often used as a reporter of transcription regulation, whereas apoaequorin is often used as a calcium indicator. Other uses of coelenterazines include chemiluminescent detection of Reactive Oxygen Species (ROS) in cells or tissues. Promega offers the following coelenterazine analogs.

Coelenterazine (native) is the luminescent substrate for *Renilla* luciferase and apoaequorin. **Formula:** $C_{26}H_{21}N_3O_3$. **Formula Weight:** 423.5. **Form:** Film.

Coelenterazine-h imparts a luminescent intensity with its aequorin complex that is reported to be 10–20 times higher than that of native coelenterazine, making this derivative a useful tool for measuring small changes in Ca^{2+} concentrations. **Formula:** $C_{26}H_{21}N_3O_2$. **Formula Weight:** 407.5. **Form:** Film.

Features:

- **Highly Pure:** 95%.
- **Custom Capabilities:** Custom packaging and sizes available.
- **Easy to Prepare:** Supplied as a dried substrate for easy preparation in methanol or ethanol.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Diamond™ Nucleic Acid Dye

Product	Size	Cat.#
Diamond™ Nucleic Acid Dye	500 µl	H1181

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Diamond™ Nucleic Acid Dye is a sensitive fluorescent dye that binds to single-stranded DNA, double-stranded DNA and RNA, and can be used to stain and visualize nucleic acids in gels. Diamond™ Nucleic Acid Dye is compatible with denaturing and native agarose and polyacrylamide gels and can be imaged with any standard imaging system, such as by UV transillumination with a Polaroid® or digital camera, GE ImageQuant™ or Bio-Rad Gel Doc™ systems.

The concentrated dye is stable for up to 90 days at room temperature. Diamond™ Nucleic Acid Dye does not require prewashing or destaining of gels. It is more much more sensitive than ethidium bromide, so less sample nucleic acid and nucleic acid markers are required for visualization, resulting in increased savings with every gel you run.

Features:

- **Sensitive:** Sensitive detection of small amounts of nucleic acids.
- **Room-Temperature Stable:** Convenient storage allows for quick and easy use—no thawing necessary.
- **Flexible:** Compatible with a variety of common gel types and imaging equipment.

Storage Conditions: Store at room temperature (22–25°C) for up to 90 days. Store at –20°C for long-term storage.

Available in the Helix® on-site stocking system

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DTT, Molecular Grade (DL-Dithiothreitol)

Product	Size	Conc.	Cat.#
DTT, Molecular Grade	100 µl	100 mM	P1171
DTT, Molecular Grade (Dry Powder)	5 g		V3151
	25 g		V3155

P1171 For Laboratory Use. V3151, V3155 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: DTT, Molecular Grade, is an antioxidant used to stabilize enzymes and other proteins containing sulfhydryl groups. The liquid form of the product is a 100mM solution of DTT in water.

Formula: $C_4H_{10}O_2S_2$.

Formula Weight: 154.25.

Form: White crystals/powder or liquid in deionized water.

Physical/Chemical Properties of Powder:

- **Purity:** ≥99.0%.
- **Melting Point:** 40–44°C.
- **A_{283} at 20mM:** ≤0.04.
- **% Oxidized:** ≤0.50%.

Features:

- **Quality Tested:** Each lot of DTT is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at –20°C.

EDTA, 0.5M (pH 8.0), Molecular Biology Grade

Product	Size	Cat.#
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml	V4231
	400 ml	V4233

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EDTA, 0.5M (pH 8.0), Molecular Biology Grade, is a chelator of divalent cations and is suitable for biochemistry and molecular biology applications. It is supplied as a solution in deionized water.

Form: Clear, colorless liquid.

Properties:

- **pH at 25°C:** 7.9–8.1.
- **A_{280} at 0.5M:** ≤0.25.
- **RNase Activity at 0.5M:** ≤1.0% release of ^{3}H-RNA.
- **DNase Activity at 0.5M:** ≤1.0% release of ^{3}H-DNA.
- **Protease Assay:** None detected.

Storage Conditions: Store at 22–25°C.

EDTA, Disodium Salt (Dihydrate), Molecular Biology Grade

Product	Size	Cat.#
EDTA, Disodium Salt, Molecular Biology Grade	100 g	H5031
	500 g	H5032

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EDTA, Disodium Salt, Molecular Biology Grade, is a chelator of divalent metal cations.

Formula Weight: 372.20.

Properties:

- **Purity:** ≥99.0%.
- **Insolubles:** ≤0.005%.
- **Lead:** ≤5ppm.
- **Iron:** ≤10ppm.

Features:

- **Quality Tested:** Each lot of EDTA is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Ethidium Bromide Solution, Molecular Grade

Product	Size	Conc.	Cat.#
Ethidium Bromide Solution, Molecular Grade	10 ml	10 mg/ml	H5041

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Ethidium Bromide Solution, Molecular Grade (10mg/ml), is a fluorescent dye suitable for staining nucleic acids after electrophoresis or in cesium chloride gradients. The solution can be used to detect both double-stranded and single-stranded DNA.

Features:

- **Quality Tested:** Each lot of Ethidium Bromide Solution is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Formamide, Molecular Grade

Product	Size	Cat.#
Formamide, Molecular Grade	100 ml	H5051
	500 ml	H5052

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Formamide is often used for the denaturation of nucleic acids in applications such as hybridization, sequencing gel electrophoresis and electron microscopy.

Formula Weight: 45.04.

Properties:

- **Purity:** ≥99.5%.
- **Copper:** ≤1ppm.
- **Iron:** ≤1ppm.
- **Lead:** ≤1ppm.
- **Zinc:** ≤1ppm.
- **Refractive Index at 20°C:** 1.446–1.448.
- **pH at 25°C of 1%:** 6.5–7.5.
- **A_{260} at 10%:** ≤0.10.
- **A_{280} at 10%:** ≤0.02.

Features:

- **Quality Tested:** Each lot of Formamide is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Glycerol, Molecular Biology Grade

Product	Size	Cat.#
Glycerol, Molecular Biology Grade	1,000 ml	H5433

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glycerol is used for storage of enzymes at low temperatures. A 50% (w/v) glycerol solution will not freeze at –20°C. Glycerol is often used as a component in electrophoresis loading buffers because of its density (1.26g/ml). In addition, glycerol gradients can be used in the purification of bacteriophage or proteins. Cat.# H5433 is anhydrous glycerol with a purity of ≥99.5%.

Properties:

- **Purity:** ≥99.5%.
- **Calcium:** ≤2ppm.
- **Magnesium:** ≤1ppm.
- **Lead:** ≤5ppm.
- **Zinc:** ≤1ppm.
- **A_{260} at 10%:** ≤0.05.
- **A_{280} at 10%:** ≤0.05.

Features:

- **Quality Tested:** Each lot of glycerol is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Glycine, Molecular Biology Grade

Product	Size	Cat.#
Glycine, Molecular Biology Grade	500 g	H5071
	1 kg	H5073

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glycine is an amino acid used in the preparation of some electrophoresis buffers.

Formula Weight: 75.07.

Properties:

- **Purity:** ≥99.0%.
- **Iron:** ≤10ppm.
- **A_{260} at 1M:** ≤0.05.
- **A_{280} at 1M:** ≤0.05.

Features:

- **Quality Tested:** Each lot of Glycine is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Guanidine Thiocyanate, Molecular Grade (Guanidinium Thiocyanate)

Product	Size	Cat.#
Guanidine Thiocyanate, Molecular Grade	100 g	V2791

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Guanidine Thiocyanate, Molecular Grade, at high concentrations, is a protein denaturant used most commonly for the isolation of intact RNA due to its ability to inhibit RNase.

Formula Weight: 118.16.

Form: White, crystalline powder.

Properties:

- **Purity:** ≥99.0%.
- **Insolubles:** None.
- **A_{280} at 6M:** ≤0.8.
- **A_{300} at 6M:** ≤0.1.
- **A_{320} at 6M:** ≤0.1.
- **A_{410} at 6M:** ≤0.1.
- **Moisture:** ≤1%.
- **Melting Point:** 118–121°C.
- **Potassium:** ≤50ppm.
- **Sodium:** ≤0.5%.
- **Zinc:** ≤1.5ppm.
- **Copper:** ≤0.5ppm.
- **Barium:** ≤3ppm.
- **Iron:** ≤5ppm.

Features:

- **Quality Tested:** Each lot of Guanidine Thiocyanate is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Guanidine-HCl, Molecular Biology Grade (Guanidinium Hydrochloride)

Product	Size	Cat.#
Guanidine-HCl, Molecular Biology Grade	100 g	H5381
	500 g	H5383

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Guanidine-HCl, Molecular Grade, is commonly used for the isolation of intact mRNA from tissues or cultured cells.

Formula Weight: 95.53.

Form: Fine, colorless or white crystals.

Properties:

- **Purity:** ≥99.5%.
- **A_{230} at 6M:** ≤0.15.
- **A_{260} at 6M:** ≤0.03.
- **A_{280} at 6M:** ≤0.02.
- **Moisture:** ≤0.3%.
- **Melting Point:** 186–188°C.
- **Lead:** ≤5ppm.
- **Zinc:** ≤1ppm.
- **Copper:** ≤1ppm.
- **Iron:** ≤5ppm.

Features:

- **Quality Tested:** Each lot of Guanidine-HCl is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

HEPES, Molecular Biology Grade (free acid)

Product	Size	Cat.#
HEPES, Molecular Biology Grade (free acid)	100 g	H5302
	500 g	H5303

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: HEPES is a biological buffer that functions over a pH range of 6.8 to 8.2.

Formula Weight: 238.3.

Properties:

- **Appearance:** White, crystalline powder.
- **Purity:** ≥99.5%.
- **Lead:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Moisture:** ≤0.5%.
- **pH at 25°C (1M):** 5.0–6.5.
- **A_{260} at 0.1M:** ≤0.05.
- **A_{280} at 0.1M:** ≤0.04.

Features:

- **Quality Tested:** Each lot of HEPES is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

IPTG, Dioxane-Free

Product	Size	Cat.#
IPTG, Dioxane-Free	1 g	V3955
	5 g	V3951
	50 g	V3953

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: IPTG, Dioxane-Free (isopropyl-β-D-thiogalactopyranoside), is an inducer of β-galactosidase activity in many bacteria. Functioning as a *lac* analog, IPTG induces β-galactosidase activity by binding to and inhibiting the *lac* repressor. This product is used to differentiate recombinants from nonrecombinants in cloning strategies using vectors containing the *lacZ* or *lacZ* α-peptide gene.

Formula Weight: 238.31.

Form: White powder.

Properties:

- **Purity:** ≥99.0%.
- **Moisture:** ≤1%.
- **pH (5%, H_2O):** 5–7.
- **Dioxane Content:** ≤10ppm.

Storage Conditions: Store dry at 4°C or –20°C.

Luciferin-EF™ Endotoxin-Free Luciferin Na

Product	Size	Cat.#
Luciferin-EF™	25 mg	E6551
	250 mg	E6552

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin-EF™ is an endotoxin-free beetle luciferin that can be used for cell-based imaging applications in living systems, where endotoxin may create problems. Luciferin-EF™ is tested to ensure endotoxin is below detectable levels and packaged in amber vials with septa to facilitate easy dilution and use.

Features:

- **Achieve Endotoxin Levels Below Detection Limits:** No potential interference in assay due to the presence of endotoxins.
- **Be Assured of Product Integrity:** Luciferin-EF™ is packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments.
- **Appreciate Flexibility and Convenience:** Luciferin-EF™ is available in two sizes, depending on the number of experiments to be performed.

Storage Conditions: Store at –70°C.

MOPS/EDTA Buffer

Product	Size	Cat.#
MOPS/EDTA Buffer	3 × 10 ml	Y5101

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 271.

MULTI-CORE™ Buffer Pack

Product	Size	Cat.#
MULTI-CORE™ Buffer Pack	3 × 1 ml	R9991

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 122.

Nuclease-Free Water

Product	Size	Cat.#
Nuclease-Free Water	50 ml	P1193
	150 ml	P1195

P1193 For Laboratory Use. P1195 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Nuclease-Free Water is an essential component of molecular biology experiments.

Features:

- **Quality Tested:** Each lot of Nuclease-Free Water is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at <30°C.

PEG 8000, Molecular Biology Grade (Polyethylene Glycol 8000)

Product	Size	Cat.#
PEG 8000 Powder, Molecular Biology Grade	500 g	V3011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: PEG 8000 is used in the precipitation of phage, isolation of plasmid DNA and the enhancement of blunt-ended ligation reactions.

Formula Weight: 7,000–9,000.

Form: White, waxy crystalline flakes.

Properties:

- **Purity:** ≥99.0%.
- **pH at 25°C (5% water):** 5.0–7.0.

Features:

- **Quality Tested:** Each lot of PEG 8000 is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 22–25°C.

Protease Inhibitor Cocktail

Product	Size	Cat.#
Protease Inhibitor Cocktail, 50X	1 ml	G6521

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Protease Inhibitor Cocktail is used to prevent protein degradation after lysing cells. The product is a mixture of six different protease inhibitors with different target protease specificities. The inhibitor cocktail is EDTA-free and provided as a powder, ready for reconstitution in 1ml of either 100% ethanol or DMSO to obtain a 50X working solution.

Features:

- **Broad Specificity:** Inhibitor cocktail is effective against a diverse number of proteases.
- **Great Potency:** Reagent provides the best-in-class level of protease inhibition.
- **Highly Compatible:** Works with a wide array of protein fusion tags (e.g., Flag®, His tag, GST tag) and capture technologies. It is ideally suited for HaloTag® Technology-based approaches.

Storage Conditions: Store powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

RNase A Solution

Product	Size	Conc.	Cat.#
RNase A Solution	1 ml	4 mg/ml	A7973
	5 ml	4 mg/ml	A7974

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: RNase A is an endoribonuclease that specifically hydrolyzes RNA 3′ of pyrimidine residues and cleaves the phosphodiester linkage to the adjacent nucleotide. RNase A is used to remove RNA during procedures for the isolation of plasmid and genomic DNA.

Storage Conditions: Store at 15–30°C.

SDS Solution, Molecular Biology Grade (10% w/v)

Product	Size	Cat.#
SDS Solution, Molecular Biology Grade (10% w/v)	100 ml	V6551
	500 ml	V6553

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SDS Solution (10% w/v) is sodium dodecyl sulfate in distilled, deionized water. SDS is a detergent that is known to denature proteins. It is used in polyacrylamide gel electrophoresis for the determination of protein molecular weight. It is also used in nucleic acid extraction procedures for the disruption of cell walls and dissociation of nucleic acid:protein complexes.

Properties:

- **A_{260}:** ≤0.3.
- **A_{280}:** ≤0.2.

Features:

- **Quality Tested:** Each lot of SDS Solution is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 22–25°C.

Sephacryl® S-400

Product	Size	Cat.#
Sephacryl® S-400	10 ml	V3181

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sephacryl® S-400 is a chromatography matrix used for rapid gel filtration. This matrix is useful in experiments involving the incorporation of synthetic linkers and adaptors. After linker ligation and digestion with the appropriate enzyme, unincorporated linkers and linker fragments may be rapidly removed from the DNA sample using spin columns containing Sephacryl® S-400. Such columns may be used to separate small DNA fragments (≤271bp) from longer DNA molecules.

Composition: Suspension in 10mM Tris-HCl (pH 8.0), 100mM NaCl and 1mM EDTA.

Features:

- **Quality Tested:** Each lot is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 4°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Sodium Chloride, Molecular Biology Grade

Product	Size	Cat.#
Sodium Chloride, Molecular Biology Grade	500 g	H5271
	1 kg	H5273

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sodium Chloride, Molecular Biology Grade, is commonly used in many molecular biology and forensic applications.

Formula Weight: 58.45.

Properties:

- **Purity:** ≥99.5%.
- **Iron:** ≤2ppm.
- **Lead:** ≤5ppm.
- **pH at 25°C of 1M:** 5.0–8.0.
- **A_{260} at 1M:** ≤0.02.
- **A_{280} at 1M:** ≤0.01.
- **Conductivity at 25°C (0.05M):** 5,000–7,000µSm.

Features:

- **Quality Tested:** Each lot of Sodium Chloride is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS)

Product	Size	Cat.#
Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS)	100 g	H5113
	500 g	H5114
	1 kg	H5115

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS), is a detergent that is known to denature proteins. It is used in denaturing polyacrylamide gel electrophoresis for the determination of protein molecular weight. It is also used in nucleic acid extraction procedures for the disruption of cell walls and dissociation of nucleic acid:protein complexes.

Formula Weight: 288.38.

Properties:

- **Purity:** ≥99.5%.
- **pH at 25°C (3% w/v):** 6.0–7.5.
- **A_{230} at 3%:** ≤0.40.
- **A_{260} at 3%:** ≤0.30.
- **A_{280} at 3%:** ≤0.05.
- **A_{405} at 3%:** ≤0.01.

Features:

- **Quality Tested:** Each lot is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at 22–25°C.

SSC Buffer, 20X, Molecular Grade

Product	Size	Cat.#
SSC Buffer, 20X, Molecular Grade	1,000 ml	V4261

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SSC Buffer, 20X, Molecular Grade (pH 7.0), is commonly used in nucleic acid hybridization techniques at concentrations from 0.1X to 20X, depending on the application.

Form: Clear, colorless liquid.

Composition: 3M NaCl, 0.3M sodium citrate (for 20X concentration).

Properties:

- **pH at 25°C (20X):** 6.9–7.1.
- **Lead:** ≤10ppm.
- **Conductivity at 25°C (2X):** 24.4–32.4mmhos.

Features:

- **Quality Tested:** Each lot of SSC Buffer is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Streptavidin

Product	Size	Cat.#
Streptavidin	1 mg	Z7041

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Promega Streptavidin is purified by affinity chromatography and is of the highest quality available.

Storage Conditions: Store at –20°C.

Streptavidin Alkaline Phosphatase

Product	Size	Cat.#
Streptavidin Alkaline Phosphatase	0.5 ml	V5591

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Streptavidin Alkaline Phosphatase is used for the detection of biotinylated molecules.

Composition: Conjugated Streptavidin Alkaline Phosphatase in PBS, 1mg/ml BSA, 1mM $MgCl_2$, 0.1mM $ZnCl_2$ and 0.02% sodium azide.

Features:

- **Quality Tested:** Streptavidin Alkaline Phosphatase is quality tested to ensure optimal performance for the detection of biotinylated molecules.

Storage Conditions: Store at 4°C. **Do not freeze!**

TAE Buffer, Molecular Biology Grade (Tris-acetate-EDTA)

Product	Size	Conc.	Cat.#
TAE Buffer, 10X, Molecular Biology Grade	1,000 ml	10 X	V4271
TAE Buffer, 40X, Molecular Biology Grade	1,000 ml	40 X	V4281

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TAE Buffer is the most commonly used buffer for agarose DNA electrophoresis. A 1X solution is obtained by adding 1 part of the concentrated TAE to 9 or 39 parts of deionized water.

Form: Clear, colorless liquid.

Properties:

- **Composition (10X):** 400mM Tris-acetate, 10mM EDTA.
- **Composition (40X):** 1.6M Tris-acetate, 40mM EDTA.
- **pH at 25°C:** 8.2–8.4.
- **Lead:** ≤10ppm.

Features:

- **Quality Tested:** Each lot of TAE Buffer is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

TBE Buffer, 10X, Molecular Biology Grade

Product	Size	Cat.#
TBE Buffer, 10X, Molecular Biology Grade	1,000 ml	V4251

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TBE Buffer, 10X (pH 8.3), is used for polyacrylamide and agarose gel electrophoresis. This product has been optimized for use in DNA applications.

Form: Clear, colorless liquid.

Composition: 890mM Tris-borate, 890mM boric acid, 20mM EDTA.

Properties:

- **pH at 25°C (1X):** 8.2–8.4.

Features:

- **Quality Tested for DNase Activity:** Each lot of TBE Buffer is tested and demonstrates ≤1% release.
- **Quality Tested for RNase Activity:** Each lot of TBE Buffer is tested and demonstrates ≤1% release.

Storage Conditions: Store at 22–25°C.

TE Buffer, 1X, Molecular Biology Grade

Product	Size	Cat.#
TE Buffer, 1X, Molecular Biology Grade	100 ml	V6231
	500 ml	V6232

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TE Buffer, 1X, Molecular Grade (pH 8.0), is a buffer composed of 10mM Tris-HCl containing 1mM EDTA•Na_2.

Properties:

- **pH at 25°C:** 7.9–8.1.
- **A_{280}:** ≤0.05.

Features:

- **Quality Tested:** Each lot of TE Buffer is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

TMB Stabilized Substrate for Horseradish Peroxidase

Product	Size	Cat.#
TMB Stabilized Substrate for Horseradish Peroxidase	200 ml	W4121

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TMB Stabilized Substrate is a stable, ready-to-use TMB (3,3´, 5,5´-tetramethylbenzidine) color development substrate for localization of horseradish peroxidase-conjugated antibodies on dot blots and Western blots. It is easier to use than 4-chloro-1-naphthol (CN), which must be prepared immediately before use. TMB Stabilized Substrate comes premixed and fully diluted in a proprietary buffer containing less than 0.5% organic solvent.

Features:

- **Convenient:** Premixed, ready-to-use; in proprietary buffer containing less than 0.5% organic solvents.
- **Stable:** Stable at room temperature for 12 months.
- **Sensitive:** At least threefold more sensitive than 4-chloro-1-naphthol (CN); as little as 412pg of β-galactosidase detected on TMB blot as compared to 1.12ng on CN blot when detected with a β-galactosidase-specific antibody and HRP-conjugated secondary antibody.
- **Long-Lasting Color:** Color is much more stable than 4-chloro-1-naphthol and photographs more easily.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Tris Base, Molecular Biology Grade

Product	Size	Cat.#
Tris Base, Molecular Biology Grade	100 g	H5133
	500 g	H5131
	2,500 g	H5135

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tris Base, Molecular Biology Grade, is commonly used for many molecular biology applications.

Formula: $C_4H_{11}NO_3$.

Formula Weight: 121.14.

Form: Crystalized free base.

Properties:

- **pH at 25°C of 1M:** 10.0–11.5.
- **Purity:** ≥99.9%.
- **A_{260} at 1M:** ≤0.05.
- **A_{280} at 1M:** ≤0.05.
- **Melting Point:** 167–172°C.
- **Moisture:** ≤0.2%.
- **Lead:** ≤2ppm.
- **Magnesium:** ≤1ppm.
- **Calcium:** ≤1ppm.
- **Iron:** ≤1ppm.

Features:

- **Quality Tested:** Each lot of Tris Base is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Tris-HCl, Molecular Biology Grade (Tris-Hydrochloride)

Product	Size	Cat.#
Tris-HCl, Molecular Biology Grade	100 g	H5121
	500 g	H5123
	2,500 g	H5125

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tris-HCl, Molecular Biology Grade, is sometimes used in combination with Tris base for preparation of Tris-HCl buffers.

Formula Weight: 157.56.

Properties:

- **pH at 25°C (0.1M):** 4.2–5.0.
- **Purity:** ≥99.0%.
- **A_{240} at 1M:** ≤0.06.
- **A_{260}, A_{280}, A_{300}, A_{600} at 1M:** ≤0.05.
- **Melting Point:** 150–152°C.
- **Moisture:** ≤0.5%.
- **Calcium:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Lead:** ≤1ppm.
- **Magnesium:** ≤1ppm.
- **Manganese:** ≤1ppm.
- **Copper:** ≤1ppm.
- **Zinc:** ≤1ppm.

Features:

- **Quality Tested:** Each lot of Tris-HCl is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Triton® X-100, Molecular Biology Grade

Product	Size	Cat.#
Triton® X-100, Molecular Biology Grade	100 ml	H5142
	500 ml	H5141

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Triton® X-100, Molecular Biology Grade, is a widely used nonionic surfactant.

Properties:

- **Moisture:** ≤1.0%.
- **Lead:** ≤5ppm.
- **Iron:** ≤5ppm.
- **Density at 25°C:** 1.0645–1.0655g/ml.

Features:

- **Quality Tested:** Each lot of Triton® X-100 is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Tween® 20, Molecular Biology Grade

Product	Size	Conc.	Cat.#
Tween® 20, Molecular Biology Grade	100 ml	100 %	H5152
	500 ml	100 %	H5151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tween® 20, Molecular Biology Grade, is a nonionic detergent used for many different molecular biology applications.

Properties:

- **Appearance:** Clear, yellow, viscous liquid.
- **Hydroxyl Number:** 96–108.
- **Lead:** ≤10ppm.

Features:

- **Quality Tested:** Each lot of Tween® 20 is tested and certified to be free of DNase, RNase and protease activity.

Storage Conditions: Store at 22–25°C.

Urea

Product	Size	Cat.#
Urea	1 kg	V3171
	5 kg	V3175

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Urea is a protein denaturant. Urea is qualified for use as the denaturing component in polyacrylamide gels.

Formula: $(NH_2)_2CO$.

Formula Weight: 60.06.

Form: Fine, white, free-flowing pastilles.

Properties:

- **Purity:** ≥99.0%.
- **Melting Point:** 132–135°C.
- **A_{280} at 8M in water:** ≤0.10.
- **Chloride:** ≤0.0005%.
- **Heavy Metals:** ≤0.001%.
- **Iron:** ≤0.001%.
- **Cyanate:** none detected.

Storage Conditions: Store at 22–25°C. Protect from moisture.

Vitronectin, Human

Product	Size	Cat.#
Vitronectin, Human	100 µg	G5381
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Human Vitronectin is purified from plasma. Vitronectin belongs to the group of structurally and functionally homologous adhesive proteins (fibrinogen, fibronectin, Von Willebrand factor) that interact with platelets and the vessel wall in the early stages of blood clotting. When coated on surfaces, very low concentrations of Vitronectin promote endothelial cell attachment and induce spreading and migration of cells in a time- and concentration-dependent fashion.

Activity: When coated onto tissue culture plastic, Vitronectin promotes one-half maximal attachment of BALB/3T3 fibroblasts in serum-free medium below 0.1µg/cm^2. Maximal attachment occurs at approximately 0.2µg/cm^2.

Storage Conditions: Store at –70°C.

Western Blue® Stabilized Substrate for Alkaline Phosphatase

Product	Size	Cat.#
Western Blue® Stabilized Substrate for Alkaline Phosphatase	100 ml	S3841
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Western Blue® Stabilized Substrate for Alkaline Phosphatase is a stable, ready-to-use substrate for Western blots and immunoscreening. It is a mixture of 5-bromo-4-chloro-3-indolyl-phosphate (BCIP) and nitro blue tetrazolium (NBT) in a proprietary stabilizing buffer. Western Blue® Substrate should be used directly and without dilution. This liquid substrate deposits a permanent dark purple stain on membrane sites bearing alkaline phosphatase. Western Blue® Substrate is as sensitive as other reagents based on the BCIP/NBT formulation.

Features:

- **Convenient:** Ready-to-use formulation that does not require dilution or reagent mixing.
- **Sensitive:** Substrate is as sensitive as other commercially available BCIP/NBT formulations and reagents.
- **Stable:** Stable for one year at room temperature.

Storage Conditions: Store at room temperature, 22–25°C.

X-Gal (5-bromo-4-chloro-3-indolyl-β-D-galactopyranoside)

Product	Size	Conc.	Cat.#
X-Gal	100mg/2 ml	50 mg/ml	V3941
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: X-Gal, in conjunction with IPTG, is used to detect β-galactosidase activity to differentiate recombinants from nonrecombinants in cloning experiments using vectors containing the *lac*Z or *lac*Z α-peptide gene.

Features:

- **Concentration:** 50mg/ml in dimethylformamide, 2.0ml/vial.
- **Quality Tested:** X-Gal is tested for use with the pGEM®-Z Vectors in a chromogenicity assay.

Storage Conditions: Store at 4°C or –20°C.

Nucleic Acids

Genomic DNA

Product	Size	Cat.#
Human Genomic DNA: Male	100 µg	G1471
Human Genomic DNA: Female	100 µg	G1521
Human Genomic DNA	100 µg	G3041
Mouse Genomic DNA	100 µg	G3091
G1471, G1521, G3041 For Laboratory Use. G3091 For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Genomic DNA from selected species are purified, and greater than 90% of the DNA is longer than 50kb in size as measured by pulsed-field gel electrophoresis. The DNA is suitable for Southern blot hybridizations, genomic analysis (including PCR), and genomic library construction. The Mouse Genomic DNA is isolated from whole blood from disease-free mice. Human Genomic DNA comes from multiple anonymous donors.

Storage Conditions: Store at 4°C.

Herring Sperm DNA

Product	Size	Conc.	Cat.#
Herring Sperm DNA	10 mg	10 µg/µl	D1811
	100 mg	10 µg/µl	D1815
	500 mg	10 µg/µl	D1816
For Laboratory Use.			

Description: Herring Sperm DNA is tested and certified to be free of any DNase or RNase activity. It is useful as a blocking agent in nucleic acid hybridization experiments.

Features:

- **Quality Tested:** Certified to be free of any DNase or RNase activity.
- **Multiple Applications:** Use as a blocking agent in hybridizations or as carrier DNA.
- **Ready to Use:** Provided as a 10mg/ml solution.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Note: Product may be viscous at 4°C. Prior to use, ensure product is at room temperature (it may be briefly warmed at 37°C) and mixed thoroughly to ensure homogeneity.

Lambda DNA

Product	Size	Cat.#
Lambda DNA	250 µg	D1501
For Laboratory Use.		

Description: λ DNA *d*857 *Sam7* is isolated from infected *E. coli* strain W3350. Restriction enzyme-digested λ DNA (48,502bp) may be used as a molecular weight size marker in gel analysis of nucleic acids. λ DNA is also a commonly used substrate in restriction enzyme activity assays. The nucleotide sequence has been determined.

Features:

- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Unmethylated Lambda DNA

Product	Size	Cat.#
Unmethylated Lambda DNA	250 µg	D1521
For Laboratory Use.		

Description: Unmethylated *d*857 *Sam7* Lambda DNA (48,502bp) is isolated from infected GM119, an *E. coli* strain lacking both the *dam* and *dcm* methylase activities. Unmethylated Lambda DNA is used as a substrate for restriction enzymes sensitive to DNA methylation.

Features:

- **Unmethylated Substrate:** Use as a substrate for methylation-sensitive restriction enzymes.

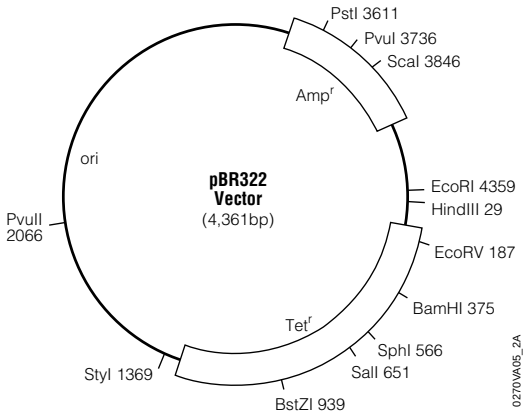
Storage Conditions: Store at –20°C.

pBR322 Vector

Product	Size	Conc.	Cat.#
pBR322 Vector	10 µg	1 µg/µl	D1511
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The plasmid pBR322 Vector (4,361bp) carries the genes for tetracycline and ampicillin resistance. pBR322 DNA digests typically are used as molecular weight size markers in gel analysis of nucleic acids.

Storage Conditions: Store at –20°C.

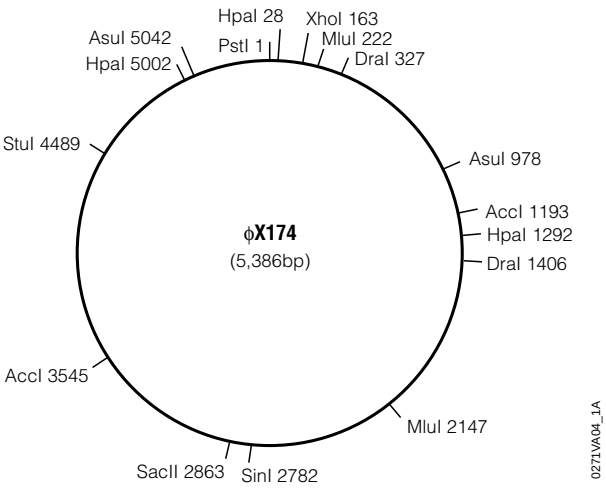


ΦX174, RF DNA

Product	Size	Conc.	Cat.#
ΦX174, RF DNA	50 µg	1 µg/µl	D1531
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The icosahedral bacteriophage ΦX174 replicative form (RF) is a double-stranded circular DNA molecule of 5,386 bases. Restriction enzyme-digested ΦX174 DNA generates molecular weight size markers used in gel analysis of nucleic acids. ΦX174 DNA is often used in the assays of restriction enzymes for the presence of nickase activity.

Storage Conditions: Store at –20°C.



K562 DNA High Molecular Weight

Product	Size	Cat.#
K562 DNA High Molecular Weight	30 µg	DD2011
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: K562 DNA is purified from a subculture of the human chronic myelogenous leukemia cell line. K562 DNA serves as a control for most steps of the single-locus probe analysis procedure. The DNA also can be used as a reference for determining fragment sizes of VNTR alleles following appropriate restriction digestion. K562 fragment sizes obtained may vary slightly due to interlaboratory differences in protocols and methods of analysis.

Concentration: 0.4–1.0µg/µl.

Storage Conditions: Store at –20°C. Always avoid multiple freeze-thaw cycles or exposure to frequent temperature changes. These fluctuations can greatly alter product stability.

Automatic Processor Compatible (APC) Film

Product	Size	Cat.#
Automatic Processor Compatible (APC) Film	25 sheets	Q4411
Automatic Processor Compatible (APC) Film, Sample Size	6 sheets	Q4412

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Automatic Processor Compatible (APC) Film provides the means to capture enhanced images and permanent copies of results. The film is exposed using fluorescent light from a standard light box. Films are easily developed using typical darkroom reagents; development may be performed manually or by using an automatic film processor. Film size = 30 × 40cm.

Gel Drying Film

Product	Size	Cat.#
Gel Drying Film, 25.0 × 28cm (50 uses)	100 sheets	V7131

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Gel Drying Film is a clear cellulose film used with the Gel Drying Kit. Gel Drying Film is essentially gas-impermeable when dry.

Storage Conditions: Store at room temperature.

Gel Drying Kit

Product	Size	Cat.#
Gel Drying Kit, 17.5 × 20cm capacity	1 kit	V7120

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Gel Drying Kit provides a convenient and economical alternative to expensive and sometimes problematic gel dryers and vacuum systems. Both polyacrylamide and agarose gels may be dried using this kit. After electrophoresis, gels are placed between two moistened sheets of clear cellulose film, the sheets are clamped between the frames, and the gels are left to dry overnight. Gels dried in this manner can be viewed easily while drying and, once dry, are protected from damage and can be stored in laboratory notebooks. The Gel Drying Film is essentially gas-impermeable when dry.

A set of Gel Drying Frames will accommodate one standard 16 × 16cm polyacrylamide gel, four 7 × 9cm minigels or one 7 × 10cm agarose gel.

Features:

- **Convenient and Cost-Effective:** Offers an alternative to gel dryers and vacuum systems.
- **Flexible:** Both polyacrylamide and agarose gels can be dried.
- **Easy to View:** Gels are viewed easily while drying.
- **Easy to Store:** Dried gels are protected from damage and can be stored in laboratory notebooks.
- **Easy to Use:** Dried gels may be scanned densitometrically and also projected using an overhead projector.

Storage Conditions: Store at room temperature.

Plates

Product	Size	Cat.#
Wizard® SV 96 Binding Plates	10 pack	A2271
	100 pack	A2278
Wizard® SV 96 Lysate Clearing Plates	10 pack	A2241
	100 pack	A2248
384-Well Plate, Flat	10 /pk	V5291
384-Well Plate, Conical	10 /pk	V5311

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Binding Plates, Lysate Clearing Plates and 384-Well Plates (Flat and Conical) are available for nucleic acid purification.

The Wizard® SV 96 Binding Plates are used with the Wizard® SV 96 Plasmid DNA Purification System (Cat.# A2250, A2255), Wizard® SV 96 Genomic DNA Purification System (Cat.# A2370, A2371) and Wizard® SV 96 PCR Clean-Up System (Cat.# A9340, A9341, A9342) to isolate DNA, or with the SV 96 Total RNA Isolation System (Cat.# Z3500, Z3505) to isolate RNA. The isolation procedures can be performed manually or on a robotic platform. The Binding Plates are designed for use with the Vac-Man® 96 Vacuum Manifold (Cat.# A2291) or a comparable manifold.

The Wizard® SV 96 Lysate Clearing Plates are used with the Wizard® SV 96 Binding Plates (Cat.# A2271, A2278) and the Vac-Man® 96 Vacuum Manifold (Cat.# A2291) for simultaneous lysate clearing and DNA binding in the Wizard® SV 96 (Cat.# A2250, A2255) and Wizard® SV 9600 (Cat.# A2258) Plasmid DNA Purification System protocols.

Promega Barrier Tips

Product	Size	Cat.#
Promega 10 Barrier Tips, 960/pk	0.5–10 µl	A1491
Promega 10E Barrier Tips, 960/pk	0.5–10 µl	A1501
Promega 10F Barrier Tips, 960/pk	0.5–10 µl	A1511
Promega 20 Barrier Tips, 960/pk	2–20 µl	A1521
Promega 100 Barrier Tips, 960/pk	10–100 µl	A1541
Promega 200 Barrier Tips, 960/pk	50–200 µl	A1551
Promega 1000 Barrier Tips, 480/pk	100–1,000 µl	A1561

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Aerosol barrier tips eliminate false signals and contamination caused by aerosols. Scientifically designed and tested, Promega Barrier Tips offer performance and economy when working with amplified nucleic acids (PCR), radioactive isotopes, tissue culture fluids, infectious samples, forensic and serological specimens.

Promega Barrier Tips are made with an inert ultrahydrophobic HDPE plastic that offers the effectiveness of a self-sealing barrier with the convenience of sample retrieval. In retention tests, Promega Barrier Tips virtually eliminated tip retention and sample holdup.

Features:

- **Sterile:** Promega Barrier Tips are presterilized and certified RNase- and DNase-free. Tips are supplied packaged and sealed in covered trays.
- **Convenient:** Designed to fit perfectly on all major brands of pipettor.

Storage Conditions: Store at room temperature.

Tip/Pipette Compatibility Guide.

Tip	Size	Gilson Pipet-man®	Eppendorf Reference®	Nichiryo Oxford Bench-mate®	Finn-pipette®
Promega 10	10µl	P10 & P20	0.1–2.5µl, 0.5–10µl	0.1–2µl	0.5–10µl, 5–50µl
Promega 10E	10µl	P10 & P20	0.1–2.5µl, 0.5–10µl	0.1–2µl	0.5–10µl, 5–50µl
Promega 10F	10µl	P20, P100 & P200	2–20µl, 10–100µl, 50–200µl	2–20µl	2–20µl, 5–50µl, 20–200µl, 30–300µl
Promega 20	20µl	P20, P100 & P200	2–20µl, 10–100µl, 50–200µl	2–20µl	2–20µl, 5–50µl, 20–200µl, 30–300µl
Promega 100	100µl	P200	50–200µl		5–50µl, 20–200µl, 30–300µl
Promega 200	200µl	P200	50–200µl		5–50µl, 20–200µl, 30–300µl
Promega 1000	1,000µl	P1000	100-1,000µl		100–1,000µl, 200–1,000µl, 100–1,200µl

9164LB

Promega Flipper® Racks

Product	Size	Cat.#
Promega Flipper® Rack, Blue	8 × 8 tubes	Y9341
Promega Flipper® Rack, Purple	8 × 12 tubes	Y9422

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The versatile Promega Flipper® Racks are ideal for storage and transport of all of your small tubes. These polypropylene racks withstand extreme temperatures, making them an excellent choice for freezer storage. They also may be autoclaved for use in sterile environments. Each rack is two-sided; one side accommodates 0.5ml microcentrifuge tubes, the other 1.5ml tubes or 2ml cryogenic tubes. The Blue Flipper® Rack holds 64 tubes, and the Purple Flipper® Rack holds 96 tubes. Clear lids permit easy viewing of rack contents.

Features:

- **Withstand Extreme Temperatures:** Blue Flipper® Racks may be stored at –90°C; Purple Flipper® Racks at –30°C. Both may be autoclaved.
- **Convenient:** Store 0.5ml, 1.5ml or 2ml tubes.

Storage Conditions: Minimum storage temperature: Blue, –90°C; Purple, –30°C. Maximum temperature: Autoclavable.

2235TB

Promega Flipper® Rack. Purple (Cat.# Y9422).

2236TB

Promega Flipper® Rack. Blue (Cat.# Y9341).

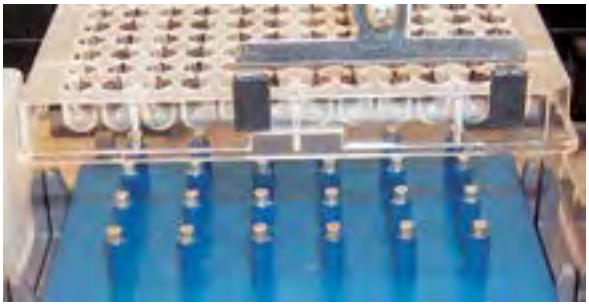
Magnetic Stands and Spacers

Product	Size	Cat.#
MagnaBot® 96 Magnetic Separation Device	1 each	V8151
MagnaBot® II Magnetic Separation Device	1 each	V8351
MagnaBot® Flat Top Magnetic Separation Device	1 each	V6041
Plate Clamp 96	1 each	V8251
Plate Stand	1 each	V8261
Deep Well MagnaBot® 96 Magnetic Separation Device	1 each	V3031
Heat Transfer Block	1 each	Z3271
Heat Block Insert	1 each	Z3651
MagnaBot® Spacer 3/16 inch	1 each	V8381
MagnaBot® Spacer 1/8 inch	1 each	V8581
MagnaBot® Spacer 1/16 inch	1 each	V8681
1/4 inch Foam Spacer	1 each	Z3301
MagnaBot® 384 Magnetic Separation Device	1 each	V8241
384-Well Plate, Flat	10 /pk	V5291
384-Well Plate, Conical	10 /pk	V5311

V8151, V8351, V6041, V8251, V8261, V3031, Z3271, Z3651, V8381, V8581, V8681, Z3301, V5291, V5311 For Research Use Only. Not for Use in Diagnostic Procedures.
V8241 For Laboratory Use.

3993TA02_3A

MagnaBot® 96 Magnetic Separation Device (Cat.# V8151).


2889TA03_0A

MagnaBot® 96 Magnetic Separation Device (Cat.# V8151) with a 96-well Collection Plate and robotic gripper arm.


3417TA05_1A

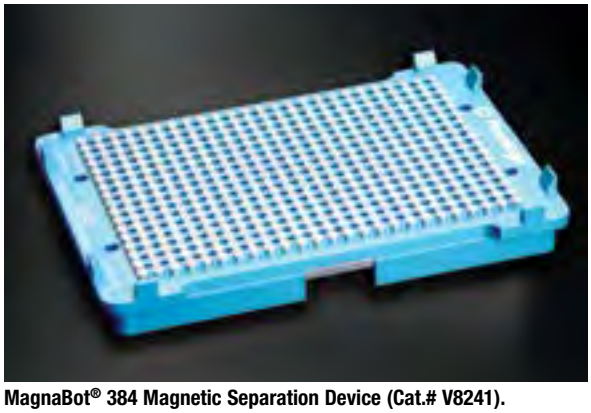
MagnaBot® II Magnetic Separation Device (Cat.# V8351).


3375TA05_1A

Plate Clamp 96 (Cat.# V8251) with a 96-well PCR plate.


3373TA05_1A

Plate Stand (Cat.# V8261).


3995TA02_3A

MagnaBot® 384 Magnetic Separation Device (Cat.# V8241).

Available in the Helix® on-site stocking system

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Magnetic Stands and Spacers-continued

Product	Size	Cat.#
MagneSphere® Technology Magnetic Separation Stand (two-position)	0.5 ml	Z5331
	1.5 ml	Z5332
	12 × 75 mm	Z5333
MagneSphere® Technology Magnetic Separation Stand (twelve-position)	0.5 ml	Z5341
	1.5 ml	Z5342
	12 × 75 mm	Z5343
PolyATtract® System 1000 Magnetic Separation Stand	1 each	Z5410

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2312TA07_8A

MagneSphere® Technology Magnetic Separation Stand (two-position) (Cat.# Z5331, Z5332, Z5333).

2309TA07_8A

MagneSphere® Technology Magnetic Separation Stand (twelve-position) (Cat.# Z5341, Z5342, Z5343).

2311TA07_8A

PolyATtract® System 1000 Magnetic Separation Stand (Cat.# Z5410).

MagneSphere® Magnetic Separation Stands Compatible with the PolyATtract® Systems.

Stand Cat.#	Sample Size	Compatible Product
2-Position Stand		
Z5331	5–10mg	PolyATtract® System 1000
Z5332	5–35mg	PolyATtract® System 1000 PolyATtract® System III or IV
	1×10^6 cells	PolyATtract® System 1000
Z5333	35–100mg	PolyATtract® System 1000 PolyATtract® System I or II
Z5410	0.1–1g or 10^7–10^8 cells	PolyATtract® System 1000
12-Position Stand		
Z5341	5–10mg	PolyATtract® System 1000
Z5342	5–35mg or 1×10^6 cells	PolyATtract® System 1000 PolyATtract® System III or IV
Z5343	35–100mg	PolyATtract® System 1000

9488LA

Vacuum Manifolds and Accessories

Product	Size	Cat.#
Vac-Man® 96 Vacuum Manifold	1 each	A2291
Vac-Man® Jr. Laboratory Vacuum Manifold, 2-sample capacity	1 each	A7660
Vac-Man® Laboratory Vacuum Manifold, 20-sample capacity	1 each	A7231
Available Separately		
Collar for Vac-Man® 96 Vacuum Manifold	1 each	A2311
One-Way Luer-Lok® Stopcocks	10 each	A7261
Vacuum Adapters	20 each	A1331

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0173CB

3 Biologics

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Bioassays for Biologics

Bio-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bio-Glo™ Luciferase Assay System	100 ml	G7940
	10 ml	G7941

Not For Medical Diagnostic Use.

Description: The Bio-Glo™ Luciferase Assay System provides a highly sensitive, robust, homogeneous reagent for the detection of firefly luciferase reporter gene expression in the ADCC Reporter Bioassay. Bio-Glo™ Assay reagent contains a new luciferase substrate, resulting in a reagent that is more stable and more tolerant to sample components than standard luciferase assay reagents. Bio-Glo™ Assay reagent is functionally tested for performance in the ADCC Reporter Bioassay and is intended for use with this or other bioassays.

Features:

- **Simplified Assay Optimization:** Robust performance, improved storage and convenient size.
- **Room Temperature or 4°C Storage:** Extended stability of the Bio-Glo™ Reagent makes it convenient for everyday use.
- **Improved Assay Precision:** The Bio-Glo™ Reagent is less sensitive to mixing and dispensing conditions, enhancing reproducibility. Ideal for bioassay applications.
- **Brighter, Longer-Lasting Signal:** Optimized for batch and continuous-process handling, the extended bright light output allows high sensitivity, especially for extended incubations, such as 24 hours.
- **Reduced Unwanted Effects from Sample Components:** The Bio-Glo™ Assay is less sensitive to culture media, phenol red and luciferase inhibitors than other luciferase assays.

Storage Conditions: Store the Bio-Glo™ Luciferase Assay System components at –30°C to –10°C. The Bio-Glo™ Luciferase Assay Buffer can be stored at below 30°C for up to three months with approximately a 10% change in reagent functionality. For optimal performance, reconstituted Bio-Glo™ Luciferase Assay Reagent should be used the day of preparation. However, once reconstituted, Bio-Glo™ Luciferase Assay Reagent can be stored at –20°C for up to 6 weeks.

CytoTox-ONE™ Homogeneous Membrane Integrity Assay

Product	Size	Cat.#
CytoTox-ONE™ Homogeneous Membrane Integrity Assay	200–800 assays	G7890
	1,000–4,000 assays	G7891
CytoTox-ONE™ Homogeneous Membrane Integrity Assay, HTP	1,000–4,000 assays	G7892

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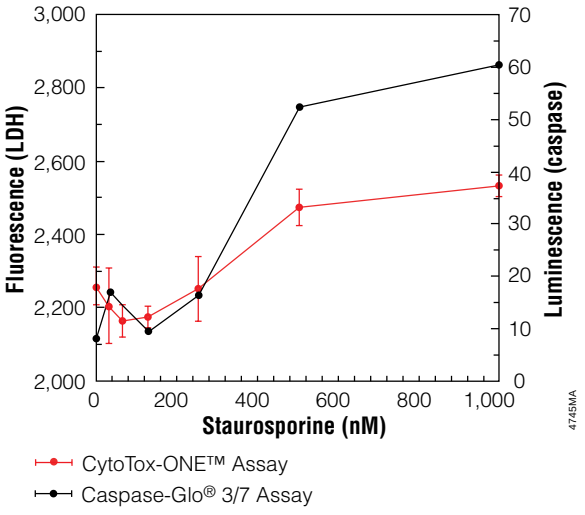
For additional information see page 67.



Multiplexing the CytoTox-ONE™ Assay and the Caspase-Glo® 3/7 Assay. With most in vitro apoptosis assays, LDH release occurs relatively late in the process. The duration of drug exposure here was carefully chosen to demonstrate the early stages of cell lysis, while retaining caspase activity.

CellTiter-Glo® Luminescent Cell Viability Assay

Product	Size	Cat.#
CellTiter-Glo® Luminescent Cell Viability Assay	10 ml	G7570
	10 × 10 ml	G7571
	100 ml	G7572
	10 × 100 ml	G7573

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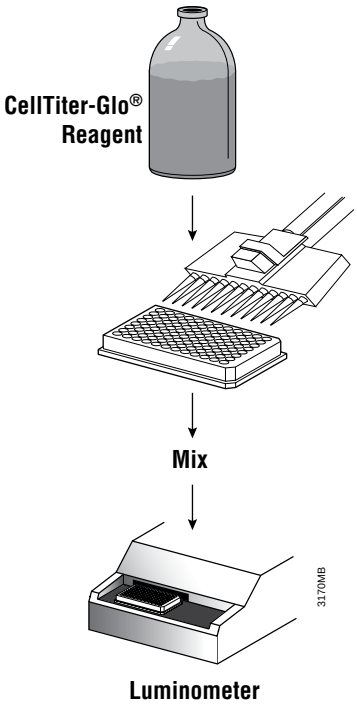
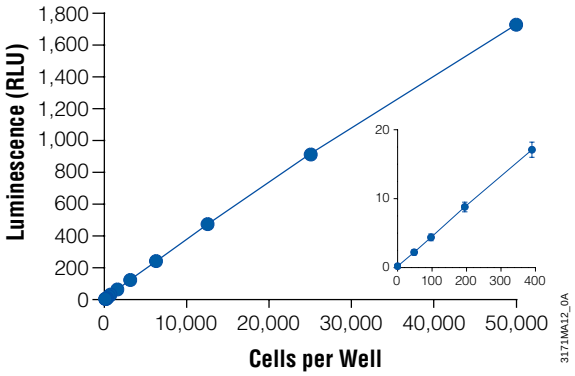
For additional information see page 58.



Flow diagram showing preparation and use of CellTiter-Glo® Reagent.



Excellent sensitivity and extended linearity. Serial twofold dilutions of Jurkat cells were made in RPMI 1640 and 10% PBS in a 96-well plate. The assay was performed as described in *CellTiter-Glo® Luminescent Cell Viability Assay Technical Bulletin,* #TB288. Values represent the mean ± S.D. of four replicates for each cell number.

GloResponse™ Luciferase Reporter Cell Lines

Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line	2 vials	E8530

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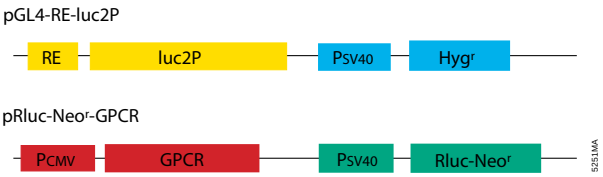
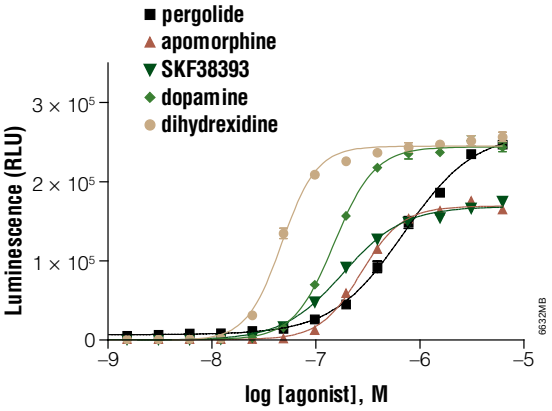
For additional information see page 69.



Two plasmids involved in the dual-luciferase GPCR assay. RE, response element/promoter; *luc2P*, destabilized firefly luciferase with PEST sequence; P_{SV40}, SV40 promoter; Hygr, hygromycin resistance gene; P_{CMV}, CMV promoter; *Rluc*-neor, *Renilla* luciferase and neomycin resistance gene fusion. PEST sequences are associated with rapidly degraded proteins.



Ranking compound potency and detection of DRD1 partial agonists. A GloResponse™ CRE-*luc2P* clone stably expressing dopamine receptor D1 was plated at 10,000 cells/well in a 96-well plate. Each agonist was serially diluted 1:2, then added to wells in replicates of four, beginning with 50µM. Cells were incubated with agonist for four hours, harvested and analyzed using the Dual-Glo™ Luciferase Assay System (Cat.# E2920). Luciferase activity was measured on the GloMax® 96 Microplate Luminometer (Cat.# E6501).

Available in the Helix® on-site stocking system

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ADCC Reporter Bioassays

ADCC Reporter Bioassay, Complete Kit (Raji)

Product	Size	Cat.#
ADCC Reporter Bioassay, Complete (Raji)	1 each	G7015
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: This ADCC Reporter Bioassay, Complete Kit (Raji), is suitable as a starter kit for trying the ADCC Reporter Bioassay or for use when the antibody of interest recognizes antigens on Raji cells.

Antibody-dependent cell-mediated cytotoxicity (ADCC) is a mechanism of action through which virus-infected or other diseased cells are targeted for destruction by the cell-mediated immune system. The ADCC Reporter Bioassay is a bioluminescent assay for quantifying Fc effector function of therapeutic antibodies as measured by activation of the NFAT signaling pathway (Figure 1; see page 33). The assay includes effector and Raji target cells provided in frozen, thaw-and-use format, reagents and an optimized protocol to provide a bioassay that has low variability and high accuracy. Moreover, the bioassay can be performed in a single day. These performance characteristics make the bioassay suitable for application across antibody drug research, development and manufactured lot release. The thaw-and-use cells provided in the ADCC Reporter Bioassay kits are generated under highly controlled conditions that result in low assay variability run to run, while eliminating the need to propagate and prepare cells for each assay.

ADCC is a desirable mechanism for killing target cancer cells using antibody-based drugs. The antibody binds to target antigens on the cell surface. When the Fc effector portion of target-bound antibodies also binds to FcγRIIIa on the surface of effector cells (natural killer cells predominantly), multiple cross-linking of the two cell types occurs, leading to pathway activation of ADCC MOA. Killing of target cells is an endpoint of this pathway activation and is used in classic ADCC bioassays, which use donor peripheral blood mononuclear cells (PBMCs) or the natural killer (NK) cell subpopulation as effector cells. These cells can be highly variable in response, are tedious to prepare and can result in high background readings.

The ADCC Reporter Bioassay uses an alternative readout at an earlier point in ADCC MOA pathway activation: the activation of gene transcription through the NFAT (nuclear factor of activated T-cells) pathway in the effector cell. In addition, the ADCC Reporter Bioassay uses engineered Jurkat cells stably expressing the FcγRIIIa receptor, V158 (high affinity) variant and an NFAT response element driving expression of firefly luciferase as effector cells. Antibody biological activity in ADCC MOA is quantified through the luciferase produced as a result of NFAT pathway activation; luciferase activity in the effector cell is quantified with luminescence readout. Signal is high, and assay background is low.

The ADCC Reporter Bioassay exhibits the specificity desired for a bioassay, as shown in Figure 2. A good assay response is only obtained when target cells with the correct surface antigen, the correct specific antibody and effector cells expressing FcγRIIIa are present. If any one of these is missing, there is no response.

The ADCC Reporter Bioassay has performance characteristics suitable for the many applications of a bioassay used across antibody drug discovery, development and manufacture: it is stability-indicating and has the precision and accuracy suitable for a lot-release bioassay. Additionally the assay can be used to quantify effects of glycosylation differences on Fc effector function of antibodies in ADCC MOA, which is useful for ADCC efficiency variant analysis. Finally, the bioassay provides antibody activity ranking equivalent to a classic LDH release ADCC bioassay (Figure 3; see page 34).

Features:

- **Simple, Easy and Homogeneous Assay:** Reduced assay-to-assay variability.
- **Cells in Frozen, Thaw-and-Use Format:** No propagation and cell culture fuss.
- **Bioluminescent Reporter Bioassay:** Sensitive with excellent signal-to-noise ratios.
- **ADCC MOA-Based:** Correlates with and suitable replacement for cytotoxic ADCC assays.
- **Scalable:** Adaptable to 384-well format.
- **Tested with FDA-Approved Antibodies.**
- **Suitable for QC Lot Release:** Stability-indicating, excellent linearity, accuracy and precision.

Note: The ADCC Reporter Bioassay components are shipped separately because of their different temperature requirements.

Storage Conditions: The ADCC Bioassay Effector Cells and Target Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Low IgG Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature. The Control Ab, Anti-CD20, is shipped on gel ice. Upon arrival, immediately transfer the vials of ADCC Bioassay Effector Cells and Target Cells for long-term storage below –140°C (freezer or liquid nitrogen vapor phase). The cells are sensitive, and care should be taken when handling. For safety reasons do not store cell vials submerged in liquid nitrogen. Low IgG Serum should be stored at –20°C. Avoid multiple freeze-thaw cycles. Bio-Glo™ Luciferase Assay Buffer and Bio-Glo™ Luciferase Assay Substrate should be stored at –20°C. Store the Control Ab, Anti-CD20, at 4°C. For optimal performance, reconstituted Bio-Glo™ Luciferase Assay Reagent should be used the day of preparation. However, once reconstituted, Bio-Glo™ Luciferase Assay Reagent can be stored at –20°C for up to 6 weeks. RPMI 1640 Medium should be stored at 4°C protected from fluorescent light.

ADCC Reporter Bioassay, Target Kit (Raji)

Product	Size	Cat.#
ADCC Reporter Bioassay, Target (Raji)	1 each	G7016
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The ADCC Reporter Bioassay, Target Kit (Raji), provides two additional reagent components to the ADCC Reporter Bioassay, Core Kit: Raji Target Cells and Control Ab, Anti-CD20, which can be used with Core Kits if desired, providing flexibility to the end user.

Antibody-dependent cell-mediated cytotoxicity (ADCC) is a mechanism of action (MOA) through which virus-infected or other diseased cells are targeted for destruction by the cell-mediated immune system. The ADCC Reporter Bioassay is a bioluminescent assay for quantifying Fc effector function of therapeutic antibodies as measured by activation of the NFAT signaling pathway (Figure 1; see page 33). Cells are provided in frozen, thaw-and-use format with reagents and an optimized protocol to provide a bioassay that has low variability and high accuracy. Moreover, the bioassay can be performed in a single day. These performance characteristics make the bioassay suitable for application across antibody drug research, development and manufactured lot release. The thaw-and-use cells provided in the ADCC Reporter Bioassay kits are generated under highly controlled conditions that result in low assay variability run to run, while eliminating the need to propagate and prepare cells for each assay.

ADCC is a desirable mechanism for killing target cancer cells using antibody-based drugs. The antibody binds to target antigens on the cell surface. When the Fc effector portion of target-bound antibodies also binds to FcγRIIIa on the surface of effector cells (natural killer cells predominantly), multiple cross-linking of the two cell types occurs, leading to pathway activation of ADCC MOA. Killing of target cells is an endpoint of this pathway activation and is used in classic ADCC bioassays, which use donor peripheral blood mononuclear cells (PBMCs) or the natural killer (NK) cell subpopulation as effector cells. These cells can be highly variable in response, are tedious to prepare and can result in high background readings.

The ADCC Reporter Bioassay uses an alternative readout at an earlier point in ADCC MOA pathway activation: the activation of gene transcription through the NFAT (nuclear factor of activated T-cells) pathway in the effector cell. In addition, the ADCC Reporter Bioassay uses engineered Jurkat cells stably expressing the FcγRIIIa receptor, V158 (high affinity) variant and an NFAT response element driving expression of firefly luciferase as effector cells. Antibody biological activity in ADCC MOA is quantified through the luciferase produced as a result of NFAT pathway activation; luciferase activity in the effector cell is quantified with luminescence readout. Signal is high and assay background is low.

The ADCC Reporter Bioassay exhibits the clear specificity desired for a bioassay, as shown in Figure 2 (below). A good assay response is only obtained when target cells with the correct surface antigen, the correct specific antibody and effector cells expressing FcγRIIIa are present. If any one of these is missing, there is no response.

The ADCC Reporter Bioassay has performance characteristics suitable for many applications of a bioassay used across antibody drug discovery, development and manufacture: it is stability-indicating and has the precision and accuracy suitable for a lot-release bioassay. Additionally the assay can be used to quantify effects of glycosylation differences on Fc effector function of antibodies in ADCC MOA, which is useful for ADCC efficiency variant analysis, for example. Finally, the bioassay provides antibody activity ranking equivalent to a classic LDH release ADCC bioassay (Figure 3; see page 34).

Features:

- **Simple, Easy and Homogeneous Assay:** Reduced assay-to-assay variability.
- **Cells in Frozen, Thaw-and-Use Format:** No propagation and cell culture fuss.
- **Bioluminescent Reporter Bioassay:** Sensitive with excellent signal-to-noise ratios.
- **ADCC MOA-Based:** Correlates with and suitable replacement for cytotoxic ADCC assays.
- **Scalable:** Adaptable to 384-well format.
- **Tested with FDA-Approved Antibodies.**
- **Suitable for QC Lot Release:** Stability-indicating, excellent linearity, accuracy and precision.

Note: The ADCC Reporter Bioassay, Target Kit (Raji), components are shipped separately because of their different temperature requirements.

Storage Conditions: The ADCC Bioassay Target Cells are shipped on dry ice. The Control Ab, Anti-CD20, is shipped on gel ice.Upon arrival, immediately transfer the vials of ADCC Bioassay Target Cells for long-term storage below –140°C (freezer or liquid nitrogen vapor phase). The cells are sensitive, and care should be taken when handling. For safety reasons do not store cell vials submerged in liquid nitrogen. Store the Control Ab, Anti-CD20, at 4°C.

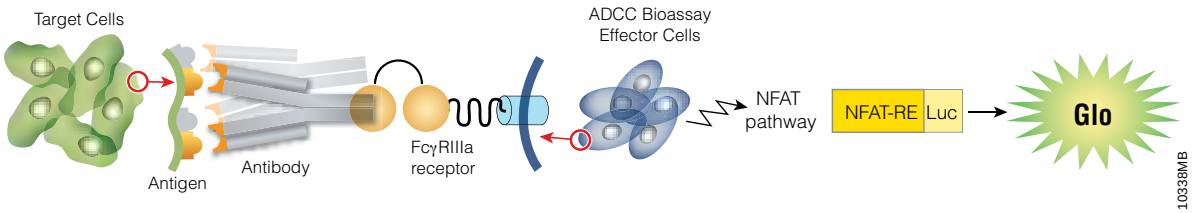

Figure 1. ADCC Reporter Bioassay Schematic. Readout is luminescence signal from NFAT response element driving expression of firefly luciferase.

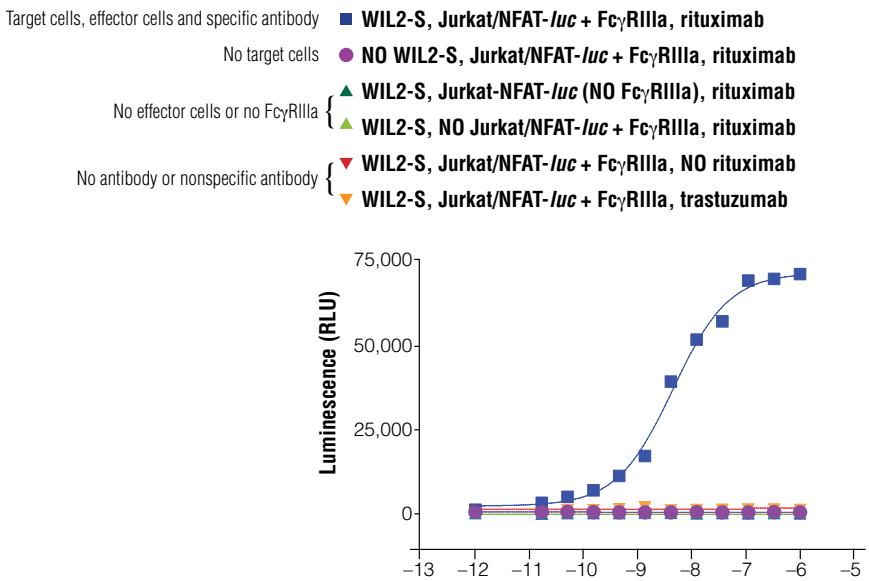

Figure 2. Specificity of the ADCC Reporter Bioassay. Serial dilutions of rituximab (anti-CD20 chimeric monoclonal antibody drug), trastuzumab (anti-Her2 humanized monoclonal antibody drug) or assay medium control (no antibody) were incubated for 6 hours of induction at 37°C with engineered Jurkat effector cells (ADCC Bioassay Effector Cells) with or without ADCC Bioassay Target Cells (WIL2-S), as indicated. Luciferase activity was quantified using Bio-Glo™ Reagent. Data were fitted using the 4PL curve fitting component of GraphPad Prism® software.

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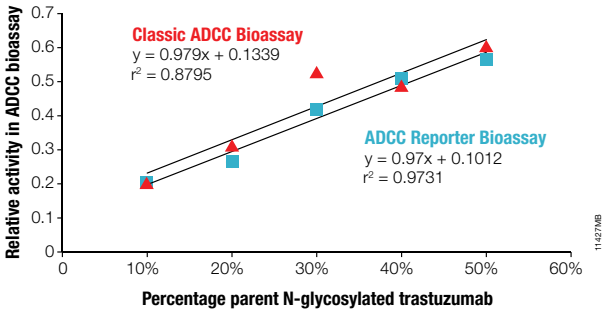

Figure 3. ADCC Reporter Bioassay provides antibody activity ranking equivalent to classic LDH release ADCC bioassay. The graph shows correlation of relative ADCC activity with fraction of trastuzumab N-glycosylation. For the experiment, trastuzumab was N-deglycosylated using PNGase F, blended with fully N-glycosylated parent preparations to create test samples representing different percentages of N-glycosylation (indicated on the x-axis) and assayed using either the ADCC Reporter Bioassay or a lytic LDH release ADCC bioassay in which PBMCs were used as effector cells. Target cells were SK-BR-3. For the ADCC Reporter Bioassay, ADCC pathway activation was measured by quantification of luciferase activity in the effector cell; for classic ADCC bioassay, LDH release from target cells was measured. For both assays, biological activity reflects downstream effects of effector cell FcγRIIIa crosslinking by antibody bound to target cells. Biological activity was determined and expressed relative to fully N-glycosylated trastuzumab, then plotted against percent N-glycosylated trastuzumab.

ADCC Reporter Bioassay, Core Kits

Product	Size	Cat.#
ADCC Reporter Bioassay, Core Kit	1 each	G7010
ADCC Reporter Bioassay, Core Kit 5X	1 each	G7018
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Antibody-dependent cell-mediated cytotoxicity (ADCC) is a mechanism of action (MOA) through which virus-infected or other diseased cells are targeted for destruction by components of the cell-mediated immune system. The ADCC Reporter Bioassay is a bioluminescent assay for quantifying Fc effector function of therapeutic antibodies as measured by activation of the NFAT signaling pathway (Figure 1; see page 33). The assay includes effector cells provided in frozen, thaw-and-use format and reagents and an optimized protocol to provide a bioassay that has low variability and high accuracy. Moreover the bioassay can be performed in a single day. These performance characteristics make the bioassay suitable for application across antibody drug research, development and manufactured lot release. The thaw-and-use cells provided in the ADCC Reporter Bioassay kits are generated under highly controlled conditions that result in low assay variability run to run, while eliminating the need to propagate and prepare cells for each assay.

ADCC is a desirable mechanism for killing target cancer cells using antibody-based drugs. The antibody binds to target antigens on the cell surface. When the Fc effector portion of target-bound antibodies also binds to FcγRIIIa on the surface of effector cells (natural killer cells predominantly), multiple cross-linking of the two cell types occurs, leading to pathway activation of ADCC MOA. Killing of target cells is an endpoint of this pathway activation and is used in classic ADCC bioassays, which use donor peripheral blood mononuclear cells (PBMCs) or the natural killer (NK) cell subpopulation as effector cells. These cells can be highly variable in response, are tedious to prepare and can result in high background readings.

The ADCC Reporter Bioassay uses an alternative readout at an earlier point in ADCC MOA pathway activation: the activation of gene transcription through the NFAT (nuclear factor of activated T-cells) pathway in the effector cell. In addition, the ADCC Reporter Bioassay uses engineered Jurkat cells stably expressing the FcγRIIIa receptor, V158 (high affinity) variant and an NFAT response element driving expression of firefly luciferase as effector cells. Antibody biological activity in ADCC MOA is quantified through the luciferase produced as a result of NFAT pathway activation; luciferase activity in the effector cell is quantified with luminescence readout. Signal is high, and assay background is low.

The ADCC Reporter Bioassay exhibits the clear specificity desired for a bioassay, as shown in Figure 2 (see page 33). A good assay response is only obtained when target cells with the correct surface antigen, the correct specific antibody, and effector cells expressing FcγRIIIa are present. If any one of these is missing, there is no response.

The ADCC Reporter Bioassay has performance characteristics suitable for many applications of a bioassay used across antibody drug discovery, development and manufacture; it is stability-indicating and has the precision and accuracy suitable for a lot-release bioassay. Additionally the assay can be used to quantify effects of glycosylation differences on Fc effector function of antibodies in ADCC MOA, which is useful for ADCC efficiency variant analysis. Finally, the bioassay provides antibody activity ranking equivalent to a classic LDH release ADCC bioassay (Figure 3).

Features:

- **Simple, Easy and Homogeneous Assay:** Reduced assay-to-assay variability.
- **Cells in Frozen, Thaw-and-Use Format:** No propagation and cell culture fuss.
- **Bioluminescent Reporter Bioassay:** Sensitive with excellent signal-to-noise ratios.
- **ADCC MOA-Based:** Correlates with and suitable replacement for cytotoxic ADCC assays.
- **Scalable:** Adaptable to 384-well format.
- **Tested with FDA-Approved Antibodies.**
- **Suitable for QC Lot Release:** Stability-indicating, excellent linearity, accuracy and precision.

Note: The ADCC Reporter Bioassay components are shipped separately because of their different temperature requirements.

Storage Conditions: The ADCC Bioassay Effector Cells are shipped on dry ice. The Bio-Glo™ Luciferase Assay System and Low IgG Serum are shipped on dry ice, separately from the cells. The RPMI 1640 Medium is shipped at ambient temperature.Upon arrival, immediately transfer the vials of ADCC Bioassay Effector Cells for long-term storage below –140°C (freezer or liquid nitrogen vapor phase). The cells are sensitive, and care should be taken when handling. For safety reasons do not store cell vials submerged in liquid nitrogen. Low IgG Serum should be stored at –20°C. Avoid multiple freeze-thaw cycles. Bio-Glo™ Luciferase Assay Buffer and Bio-Glo™ Luciferase Assay Substrate should be stored at –20°C. For optimal performance, reconstituted Bio-Glo™ Luciferase Assay Reagent should be used the day of preparation. However, once reconstituted, Bio-Glo™ Luciferase Assay Reagent can be stored at –20°C for up to 6 weeks. RPMI 1640 Medium should be stored at 4°C protected from fluorescent light.

ADCC Bioassay Effector Cells, Propagation Model

Product	Size	Cat.#
ADCC Bioassay Effector Cells, Propagation Model	1 each	G7102
Not For Medical Diagnostic Use.		

Description: ADCC Bioassay Effector Cells, Propagation Model, allows for propagation and banking of the engineered Jurkat effector cells developed for the ADCC Reporter Bioassay line of products.

Antibody-dependent cell-mediated cytotoxicity (ADCC) is a mechanism of action (MOA) through which virus-infected or other diseased cells are targeted for destruction by the cell-mediated immune system. The ADCC Reporter Bioassay is a bioluminescent assay for quantifying Fc effector function of therapeutic antibodies as measured by activation of NFAT signaling pathway (Figure 1; see page 33). The assay includes effector cells only; the user must supply the target cells, reference and test antibodies and all other reagents. The performance characteristics of the ADCC Bioassay Effector Cells make them suitable for application across antibody drug research, development and manufactured lot release. The engineered Jurkat effector cells are generated under highly controlled conditions.

ADCC is a desirable mechanism for killing target cancer cells using antibody-based drugs. The antibody binds to target antigens on the cell surface. When the Fc effector portion of target-bound antibodies also binds to FcγRIIIa on the surface of effector cells (natural killer cells predominantly), multiple cross-linking of the two cell types occurs leading to pathway activation of ADCC MOA. Killing of target cells is an endpoint of this pathway activation and is used in classic ADCC bioassays, which use donor peripheral blood mononuclear cells (PBMCs) or the natural killer (NK) cell subpopulation as effector cells. These cells can be highly variable in response, are tedious to prepare and can result in high background readings.

ADCC Bioassay Effector Cells, which comprise engineered Jurkat cells, use an alternative readout at an earlier point in ADCC MOA pathway activation: the activation of gene transcription through the NFAT (nuclear factor of activated T-cells) pathway in the effector cell. In addition, the ADCC Reporter Bioassay uses engineered Jurkat cells stably expressing the FcγRIIIa receptor, V158 (high affinity) variant, and an NFAT response element driving expression of firefly luciferase as effector cells. Antibody biological activity in ADCC MOA is quantified through the luciferase produced as a result of NFAT pathway activation; luciferase activity in the effector cell is quantified with luminescence readout. Signal is high, and assay background is low.

The ADCC Bioassay Effector Cells exhibit the specificity desired for a bioassay, as shown in Figure 2 (see page 33). A good assay response is only obtained when target cells with the correct surface antigen, the correct specific antibody, and effector cells expressing FcγRIIIa are present. If any one of these is missing, there is no response.

The ADCC Bioassay Effector Cells have performance characteristics suitable for the many applications of a bioassay used across antibody drug discovery, development and manufacture: it is stability-indicating and has the precision and accuracy suitable for a lot-release bioassay. Additionally the ADCC Bioassay Effector Cells can be used to quantify effects of glycosylation differences on Fc effector function of antibodies in ADCC MOA, which is useful for ADCC efficiency variant analysis, for example. Finally, the bioassay provides antibody activity ranking equivalent to a classic LDH release ADCC bioassay (Figure 3; see page 34).

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Features:

- **Simple, Easy and Homogeneous Assay:** Reduced assay-to-assay variability.
- **Bioluminescent Reporter Bioassay:** Sensitive with excellent signal-to-noise ratios.
- **ADCC MOA-Based:** Correlates with and suitable replacement for cytotoxic ADCC assays.
- **Scalable:** Adaptable to 384-well format.
- **Tested with FDA-Approved Antibodies.**
- **Suitable for QC Lot Release:** Stability-indicating, excellent linearity, accuracy and precision.

Storage Conditions: Upon arrival, immediately store vials of ADCC Bioassay Effector Cells, longterm, below –140°C (freezer or liquid nitrogen vapor phase). For safety reasons do not store cell vials submerged in liquid nitrogen. Product includes two vials at 2×10^7 cells/ml and 0.65ml/vial. One vial should be thawed, propagated and the cells frozen to create a cell bank. The remaining vial should be reserved as backup.

Bioanalytical Tools

ISOQUANT® Isoaspartate Detection Kit

Product	Size	Cat.#
ISOQUANT® Isoaspartate Detection Kit	100 assays	MA1010
Not For Medical Diagnostic Use.		

Description: The ISOQUANT® Isoaspartate Detection Kit is intended for quantitative detection of isoaspartic acid residues in proteins and peptides, which can result from the gradual, nonenzymatic deamidation of asparagine or rearrangement of aspartic acid residues during storage or handling. Because the kit does not depend on the monitoring of charge differences for detection, charge heterogeneity does not interfere with the assay. The ISOQUANT® Kit can be used on peptides or proteins such as monoclonal antibodies.

Features:

- **Great Efficiency:** Simple procedure with a test time of less than one hour. Automation possible with HPLC autosampler capability.
- **Economical:** HPLC detection eliminates cost and inconvenience of radioactive materials handling.
- **Analytical:** Quantitative results available.
- **Versatile:** Perform individual samples or batches. Small sample size makes the assay suitable for research, analytical methods, formulations and process development work.
- **Robust:** Not affected by common buffer components.
- **HPLC Detection Method:** Fits with existing equipment and expertise.
- **Sensitive:** Detects isoaspartate resulting from aspartic acid rearrangement as well as deamidation of asparagine.

Storage Conditions: Store at –20°C.

ProteaseMAX™ Surfactant, Trypsin Enhancer

Product	Size	Cat.#
ProteaseMAX™ Surfactant, Trypsin Enhancer	1 mg	V2071
	5 × 1 mg	V2072

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ProteaseMAX™ Surfactant, Trypsin Enhancer, is designed to improve in-gel and in-solution protein digestion. ProteaseMAX™ Surfactant ensures fast and efficient protein digestion with proteases such as Trypsin, Chymotrypsin and Lys-C. For in-gel protein digestion, ProteaseMAX™ Surfactant offers time and labor savings. The digestion step is complete in 1 hour, and the surfactant provides concurrent extraction of peptides from gels, eliminating the need for post-digestion peptide extraction. The surfactant also improves recovery of longer peptides that are retained in the gel under a standard extraction protocol. For additional data, refer to scientific posters PS094 and PS099: **www.promega.com/scientific_posters/**

For in-solution digestions, ProteaseMAX™ Surfactant solubilizes proteins, including difficult membrane proteins, and enhances protein digestion by providing a denaturing environment prior to protease addition.

ProteaseMAX™ Surfactant degrades over the course of a digestion reaction, yielding products that are compatible with downstream methods such as mass spectrometry and liquid chromatography. No long-term negative effect of the residual surfactant on the ion optics and capillary of mass spectrometers has been observed. ProteaseMAX™ Surfactant can be used with existing in-gel or in-solution digestion protocols.

Features:

- **No Peptide Extraction Required Following In-Gel Digestions:** Save time and increase the number of samples processed.
- **Improved Peptide Recovery from Gels:** Increase protein sequence coverage, thus increasing confidence in protein identification.
- **Enhanced Protein Solubilization:** Solubilize complex proteins, such as membrane proteins, at room temperature, avoiding high temperature and preventing precipitation.
- **Degrades Over Course of Digestion:** Samples are ready for use directly for mass spectrometry analysis without additional inactivation steps such as heating or acid treatment.

Storage Conditions: Store lyophilized ProteaseMAX™ Surfactant at –20°C.

Chymotrypsin, Sequencing Grade

Product	Size	Cat.#
Chymotrypsin, Sequencing Grade	25 µg	V1061
	100 µg	V1062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Chymotrypsin is a highly-purified serine endopeptidase derived from bovine pancreas that preferentially hydrolyzes at the carboxyl side of aromatic amino acids: Tyr, Phe and Trp. Cleavage may also be observed, but at a lower rate, at Leu and Met. Chymotrypsin activity is optimal in the pH range of 7.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in-solution or in-gel.

Storage Conditions: Store at 4°C.

Trypsin Gold, Mass Spectrometry Grade

Product	Size	Cat.#
Trypsin Gold, Mass Spectrometry Grade	100 µg	V5280

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Trypsin Gold, Mass Spectrometry Grade, is manufactured to provide maximum specificity. Lysine residues in the porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion. The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography and lyophilized to yield Trypsin Gold, Mass Spectrometry Grade. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Each lot of quality-tested Trypsin Gold, Mass Spectrometry Grade, is qualified for use with in-gel digestion and mass spectrometric analysis.

Learn more about our custom options for this product at: **www.promega.com/custom/**

Features:

- **Each Lot Qualified by Mass Spectrometry:** Ensures compatibility with customer applications/instrumentation.
- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability Ensured up to Five Freeze-Thaw Cycles:** Minimize leftover reagents.
- **Referenced in Thousands of Papers:** Reliable and customer proven.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the lyophilized powder at –20°C. Reconstitute powder in 50mM acetic acid and store at –20°C. For long-term storage, freeze reconstituted trypsin at –70°C. Limit the number of freeze-thaw cycles to five.

Available in the Helix® on-site stocking system

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Sequencing Grade Modified Trypsin

Product	Size	Cat.#
Sequencing Grade Modified Trypsin	100 µg	V5111
	100 µg	V5117

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Sequencing Grade Trypsin has been manufactured to provide maximum specificity. Lysine residues in porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion.

The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography and lyophilized. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Choose Your Configuration: Learn more about our custom options for this product at: **www.promega.com/custom/**

Recommended Reaction Buffer: 50mM NH_4HCO_3 (pH 7.8).

Features:

- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability:** Ensured up to five freeze-thaw cycles.
- **Reliable and Customer-Proven:** Referenced in thousands of papers.
- **Alternative Formats:** Flexibility depending on experimental design and scope.

Storage Conditions: Store lyophilized at –20°C.

Endoproteinase Lys-C, Sequencing Grade

Product	Size	Cat.#
Endoproteinase Lys-C, Sequencing Grade	5 µg	V1071

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Endoproteinase Lys-C is a sequencing grade serine protease isolated from Lysobacter enzymogenes as a highly purified protease that hydrolyzes specifically at the carboxyl side of Lys. Lys-C activity is optimal in the pH range of 7.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in-solution or in-gel.

Storage Conditions: Store at 4°C.

rLys-C, Mass Spec Grade

Product	Size	Cat.#
rLys-C, Mass Spec Grade	15 µg	V1671

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: rLys-C, Mass Spec Grade, is a recombinant Lys-C expressed in *E. coli*. Sequence origin of rLys-C is Protease IV from *Pseudomonas aeruginosa*. Similar to a native Lys-C, rLys-C cleaves at the carboxyl side of lysine residues with exceptional specificity. rLys-C retains proteolytic activity under protein denaturing conditions such as 8M urea, which is used to improve digestion of proteolytically resistant proteins. rLys-C activity is optimal in the pH range of 8-9. The protease is supplied in a lyophilized form along with a Reconstitution Buffer, which is formulated to increase stability of rLys-C solution. Frozen rLys-C solution can be stored for a month at -20ºC without detectable loss of activity. rLys-C is recommended for digestion of single proteins and complex protein mixtures in-solution and in-gel.

Features:

- **Competitive Performance:** Matches cleavage specificity of a native Lys-C. Proteolytic activity is similar.
- **Purity:** No contaminating peptides are identified with reverse-phase HPLC.
- **Application-Qualified:** Each lot is qualified by mass spectrometry.
- **Tolerance to Protein Denaturing Conditions:** Retains activity in 8M urea.
- **Cost-Effective:** Severalfold price reduction as compared to a native Lys-C.

Storage Conditions: Store at –20°C.

Asp-N, Sequencing Grade

Product	Size	Cat.#
Asp-N, Sequencing Grade	2 µg	V1621

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Asp-N, Sequencing Grade, is an endoproteinase that hydrolyzes peptide bonds on the N-terminal side of aspartic and cysteic acid residues: Asp and Cys. Asp-N activity is optimal in the pH range of 4.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in solution or in gel.

Storage Conditions: Store at 4°C.

Glu-C, Sequencing Grade

Product	Size	Cat.#
Glu-C, Sequencing Grade	50 µg	V1651

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glu-C, Sequencing Grade (*S. aureus* V8), is a serine protease that specifically cleaves at the C-terminus of either aspartic or glutamic acid residues. In ammonium bicarbonate and ammonium acetate the enzyme specificity is higher at the glutamic residues. In phosphate buffers cleavage occurs at the aspartic and glutamic residues. Glu-C activity is optimal in the pH range of 4.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in solution but not recommended for in-gel digestions.

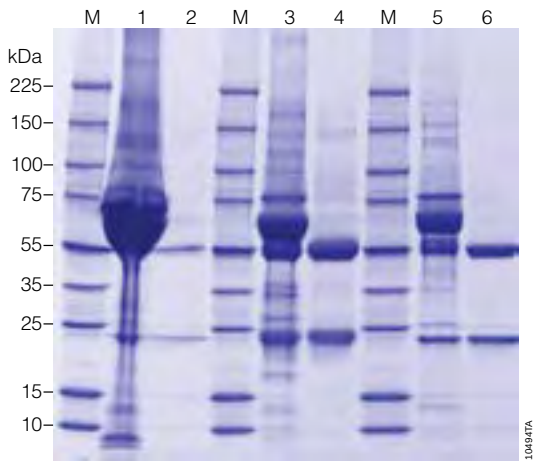
Storage Conditions: Store at 2–10°C.

Magne™ Protein G and Magne™ Protein A Beads

Product	Size	Cat.#
Magne™ Protein G Beads, 20% Slurry	1 ml	G7471
	5 ml	G7472
	50 ml	G7473
Magne™ Protein A Beads, 20% Slurry	1 ml	G8781
	5 ml	G8782
	50 ml	G8783

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 312.



IgG purified from various sample types using Magne™ Protein G Beads. Antibodies were purified from 50µl of cell culture medium (lanes 1 and 2), 50µl of mouse ascites (lanes 3 and 4) and 50µl of diluted goat serum (lanes 5 and 6). Starting material, lanes 1, 3 and 5; eluted/purified IgG, lanes 2, 4 and 6.

Magne™ HaloTag® Beads

Product	Size	Cat.#
Magne™ HaloTag® Beads, 20% Slurry	1 ml	G7281
	5 ml	G7282

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 310.

TnT® SP6 High-Yield Wheat Germ Protein Expression System

Product	Size	Cat.#
TnT® SP6 High-Yield Wheat Germ Protein Expression System	40 reactions	L3260
	10 reactions	L3261

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For additional information see page 284.

TnT® Quick Coupled Transcription/Translation System

Product	Size Conc.	Cat.#
TnT® T7 Quick Coupled Transcription/ Translation System	40 reactions	L1170
TnT® T7 Quick Coupled Transcription/ Translation System, Trial Size	5 reactions	L1171
TnT® SP6 Quick Coupled Transcription/ Translation System	40 reactions	L2080
TnT® SP6 Quick Coupled Transcription/ Translation System, Trial Size	5 reactions	L2081
Magnesium Acetate	100 µl 25 mM	L4581
Potassium Chloride	200 µl 2.5 M	L4591

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For additional information see page 285.

TnT® Coupled Reticulocyte Lysate Systems

Product	Size	Cat.#
TnT® SP6 Coupled Reticulocyte Lysate System	40 reactions	L4600
TnT® SP6 Coupled Reticulocyte Lysate System, Trial Size	8 reactions	L4601
TnT® T7 Coupled Reticulocyte Lysate System	40 reactions	L4610
TnT® T7 Coupled Reticulocyte Lysate System, Trial Size	8 reactions	L4611
TnT® T3 Coupled Reticulocyte Lysate System	40 reactions	L4950
TnT® T7/T3 Coupled Reticulocyte Lysate System	40 reactions	L5010
TnT® T7/SP6 Coupled Reticulocyte Lysate System	40 reactions	L5020

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For additional information see page 285.

TnT® Coupled Wheat Germ Extract System

Product	Size	Cat.#
TnT® SP6 Coupled Wheat Germ Extract System	40 reactions	L4130
TnT® T7 Coupled Wheat Germ Extract System	40 reactions	L4140
TnT® T7/SP6 Coupled Wheat Germ Extract System	40 reactions	L5030

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For additional information see page 286.

TnT® T7 Quick for PCR DNA

Product	Size	Cat.#
TnT® T7 Quick for PCR DNA	40 reactions	L5540
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For additional information see page 287.

Canine Pancreatic Microsomal Membranes

Product	Size	Cat.#
Canine Pancreatic Microsomal Membranes	50 µl	Y4041
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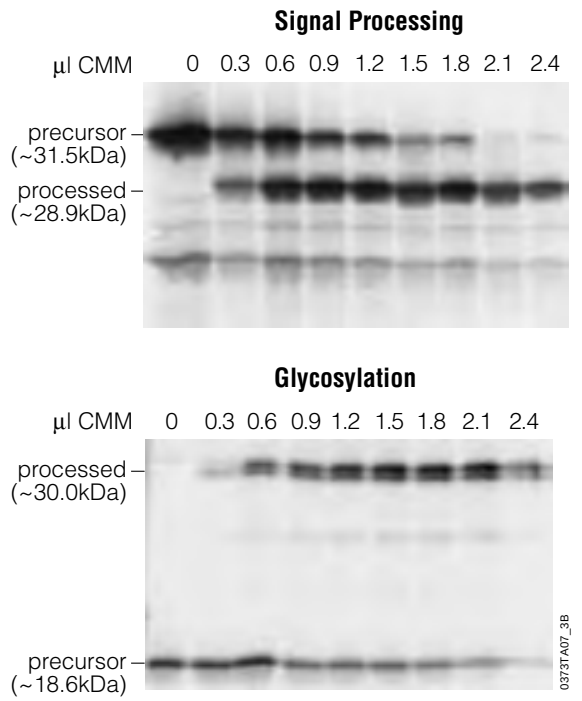
For additional information see page 289.



Processing and glycosylation activity of Canine Pancreatic Microsomal Membranes (CMM). The positive control mRNAs (0.5µg each of *E. coli* β-lactamase and *S. cerevisiae* α-factor) were translated using Rabbit Reticulocyte Lysate in a 25µl reaction for 60 minutes in the presence of the indicated amounts of CMM (3µl). Translation products were analyzed by gel electrophoresis followed by autoradiography of the [^{35}S]-labeled proteins.

Amino Acid Mixtures

Product	Size Conc.	Cat.#
Amino Acid Mixture, Complete	175 µl 1 mM	L4461
Amino Acid Mixture Minus Cysteine	175 µl 1 mM	L4471
Amino Acid Mixture Minus Methionine and Cysteine	175 µl 1 mM	L5511
Amino Acid Mixture Minus Leucine	175 µl 1 mM	L9951
Amino Acid Mixture Minus Methionine	175 µl 1 mM	L9961
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For additional information see page 289.

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Helping Advance Your Science

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ADME Assays

CYP450 Assay Systems

Product	Size	Cat.#
P450-Glo™ CYP1A2 Induction/Inhibition Assay	10 ml	V8421
	50 ml	V8422
P450-Glo™ CYP3A4 Assay with Luciferin-IPA	10 ml	V9001
	50 ml	V9002
P450-Glo™ CYP3A4 Assay (Luciferin-PPXE)	10 ml	V8911
DMSO-Tolerant Assay	50 ml	V8912
P450-Glo™ CYP3A4 Assay (Luciferin-PFBE)	10 ml	V8901
Cell-Based/Biochemical Assay	50 ml	V8902
P450-Glo™ CYP1A1 Assay	10 ml	V8751
	50 ml	V8752
P450-Glo™ CYP1B1 Assay	10 ml	V8761
	50 ml	V8762
P450-Glo™ CYP1A2 Assay	10 ml	V8771
	50 ml	V8772
P450-Glo™ CYP2C8 Assay	10 ml	V8781
	50 ml	V8782
P450-Glo™ CYP2C9 Assay	10 ml	V8791
	50 ml	V8792
P450-Glo™ CYP3A4 Assay	10 ml	V8801
	50 ml	V8802
P450-Glo™ CYP3A7 Assay	10 ml	V8811
	50 ml	V8812
P450-Glo™ CYP2C19 Assay	10 ml	V8881
	50 ml	V8882
P450-Glo™ CYP2D6 Assay	10 ml	V8891
	50 ml	V8892
Available Separately	**Size**	**Cat.#**
NADPH Regeneration System	1,000 assays	V9510

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **P450-Glo™ CYP450 Assays** provide a homogeneous, luminescent method for measuring cytochrome P450 activity. The assays are designed to measure the activities of P450s from recombinant and native sources and for testing the effects of analytes such as drugs and new chemical entities on P450 activities. These luminescent assays exhibit exquisite sensitivity, low background signals and broad dynamic range.

P450-Glo™ Assays employ luminogenic P450 substrates that are derivatives of beetle luciferin, a substrate for luciferase enzymes. The derivatives are not substrates for luciferase but are converted by P450s to luciferin, which in turn reacts with luciferase to produce light that is directly proportional to the activity of the P450.

The P450-Glo™ Assays generate a "glow-type" luminescent signal, produced using derivatized luciferins as P450 substrates and a recombinant stabilized luciferase (Ultra-Glo™ Luciferase) coupled with a proprietary buffer system. The half-life of the luminescent output is greater than two hours, eliminating the need for luminometers with injectors and allowing for batch plate processing. The formulation also minimizes the incidence of false positives due to inhibition of luciferase by analytes when screening for cytochrome P450 inhibitors.

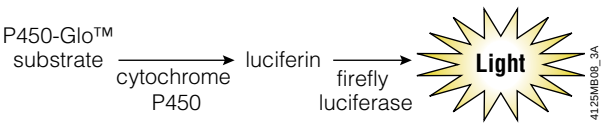
The **P450-Glo™ CYP3A4 Assay with Luciferin-IPA** contains a substrate for cytochrome 3A4 that is very well suited for all applications involving human CYP3A4 and is the best substrate available for cell-based applications. Luciferin-IPA is readily taken up by cells and rapidly converted into luciferin inside the cell, which reduces the incubation time required (typically 30–60 minutes). The low background and high signal-to-noise ratio produced using Luciferin-IPA means less starting material is required.

Dimethyl sulfoxide (DMSO), a common solvent used to solubilize chemical compounds, can significantly inhibit the activity of the 3A4 isoform of cytochrome P450, even at low concentrations (<0.1%).The P450-Glo™ CYP3A4 System (Luciferin-PPXE) DMSO-Tolerant Assay is specifically designed to tolerate DMSO in the 3A4 reaction. The assay exhibits little to no change in the signal-to-background ratio in the presence of 0.2% DMSO as compared to a no-DMSO control.

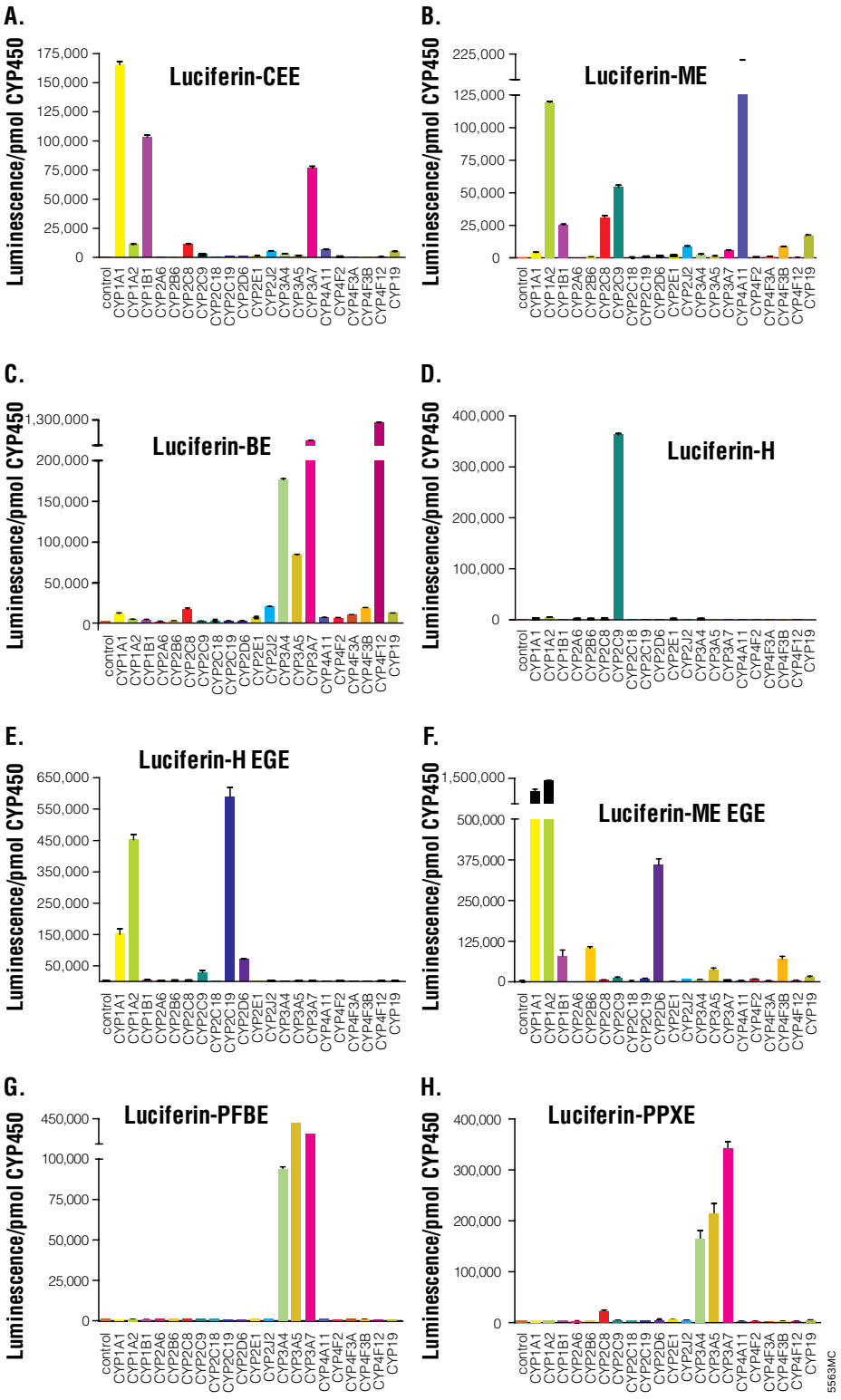
Features:

- **Obtain Reliable Results:** The broad dynamic range, low background and better sensitivity result in less ambiguous data.
- **Avoid Fluorescence Interference:** Luminescent output eliminates interference from fluorescent test compounds.
- **Save Time:** Homogeneous assay with simple "add-and-read" format.
- **Avoid False Hits:** Special formulation results in low false-hit rate.
- **Save Money:** Scalable to 384-well format, reducing cost per well.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the CYP1A2, CYP2C9 and CYP3A4 membranes at –70°C. Cytochrome P450 may lose activity with repeated freeze-thaw cycles. Avoid multiple freeze-thaw cycles by dispensing the CYP1A2, CYP2C9 and CYP3A4 membranes into single-use aliquots (e.g., 50µl for 96 reactions). Store aliquots at –70°C. All other components can be stored at –20°C or –70°C and protected from light.



Conversion of the P450-Glo™ substrate by cytochrome P450. Cytochrome P450 enzymes act on the P450-Glo™ luminogenic substrates to produce luciferin, a substrate for luciferase. Luciferase uses the luciferin to produce light.



Selectivity of the P450-Glo™ substrates for human CYP450 enzymes.

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P450-Glo™ CYP450 Screening Systems

Product	Size	Cat.#
P450-Glo™ CYP3A4 Screening System with Luciferin-IPA	1,000 assays	V9920
P450-Glo™ CYP3A4 Screening System (Luciferin-PPXE) DMSO-Tolerant Assay	1,000 assays	V9910
P450-Glo™ CYP1A2 Screening System	1,000 assays	V9770
P450-Glo™ CYP2C9 Screening System	1,000 assays	V9790
P450-Glo™ CYP3A4 Screening System	1,000 assays	V9800
P450-Glo™ CYP2C19 Screening System	1,000 assays	V9880
P450-Glo™ CYP2D6 Screening System	1,000 assays	V9890
Available Separately	**Size**	**Cat.#**
NADPH Regeneration System	1,000 assays	V9510

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Description: The P450-Glo™ Screening Systems provide a complete set of reagents for performing luminescent cytochrome P450 assays. The systems include a membrane preparation containing recombinant human cytochrome P450 enzyme, a luminogenic cytochrome P450 substrate appropriate for the enzyme, an NADPH Regeneration System, reaction buffer, Luciferin Detection Reagent and Luciferin-Free Water. The membranes are prepared from baculovirus-infected insect cells and contain human cytochrome P450 and P450 reductase (and cytochrome b5 for CYP2C9 and CYP3A4). The P450-Glo™ Screening Systems also contain a membrane fraction devoid of cytochrome P450 activity as a negative control. The assays are ideal for testing the effects of drugs and new chemical entities on cytochrome P450 enzyme activities.

The cytochrome P450 reaction is performed by incubating a luminogenic cytochrome P450 substrate with a cytochrome P450 enzyme and the NADPH Regeneration System. The luminogenic P450-Glo™ Substrates are derivatives of beetle luciferin ((4S)-4,5-dihydro-2-(6-hydroxybenzothiazolyl)-4-thiazole-carboxylic acid or D-luciferin), a substrate of firefly luciferase. The P450-Glo™ Substrates do not react with luciferase but are converted by cytochrome P450 to luciferin, which in turn reacts with luciferase to produce light. Light is used to monitor cytochrome P450 activity because the amount of light produced is directly proportional to the amount of D-luciferin produced by cytochrome P450.

The **P450-Glo™ CYP3A4 Screening System with Luciferin-IPA** contains the most sensitive P450-Glo™ 3A4 substrate available. Luciferin-IPA displays the widest range of inhibition profiles of all the P450-Glo™ CYP3A4 substrates.

Dimethyl sulfoxide (DMSO), a common solvent used to solubilize chemical compounds, can significantly inhibit the activity of the 3A4 isoform of cytochrome P450, even at low concentrations (<0.1%). The P450-Glo™ CYP3A4 Screening System (Luciferin-PPXE) DMSO-Tolerant Assay is specifically designed to tolerate DMSO in the 3A4 reaction. The assay exhibits little to no change in the signal-to-background ratio in the presence of 0.2% DMSO as compared to a no-DMSO control.

After the cytochrome P450 reaction has been performed, the reconstituted Luciferin Detection Reagent is added. This reagent simultaneously stops the cytochrome P450 reaction and initiates a stable glow-type luminescent signal. The glow-type reaction produces a stable signal and eliminates the need for strictly timed luminescence detection. Protocols are configured for multiwell plate formats but can be easily adapted for single-tube applications.

Features:

- **Complete Systems:** The systems include a membrane preparation containing recombinant human cytochrome P450 enzyme, a luminogenic cytochrome P450 substrate appropriate for the enzyme, an NADPH regeneration system, reaction buffer, Luciferin Detection Reagent and Luciferin-Free Water.
- **Speed:** The luminescent format eliminates the need for time-consuming analyses such as HPLC.
- **Robust:** Z′ values greater than 0.8 in either 96- or 384-well plate formats. Highly predictive results.
- **Luminescent Output:** No interference by fluorescent compounds.
- **Broad Dynamic Range and Low Background:** Excellent sensitivity.
- **Low False-Positive Rate:** Use of a proprietary stabilized firefly luciferase and a proprietary luciferase assay formulation minimizes the incidence of false positives due to inhibition of luciferase by analytes when screening for cytochrome P450 inhibitors.
- **Scalable:** Easily scalable to 384-well plate format.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**

Storage Conditions: Store the CYP1A2, CYP2C9 and CYP3A4 membranes at –70°C. Cytochrome P450 may lose activity with repeated freeze-thaw cycles. Avoid multiple freeze-thaw cycles by dispensing the CYP1A2, CYP2C9 and CYP3A4 membranes into single-use aliquots (e.g., 50µl for 96 reactions). Store aliquots at –70°C. All other components can be stored at –20°C or –70°C and protected from light. The reconstituted Luciferin Detection Reagent can be stored at –20°C for up to 3 months. For convenience, the reconstituted Luciferin Detection Reagent can be stored at room temperature (approximately 23°C) without loss of activity for 24 hours or at 4°C for 1 week. Avoid multiple freeze-thaw cycles of all components.

Luminogenic Enzyme Substrates

Product	Size	Cat.#
Luciferin Detection Reagent	50 ml	V8921
	10 ml	V8920
Luciferin Detection Reagent with esterase	50 ml	V8931
	10 ml	V8930
Luciferin-NAT2	3 mg	P1721
Luciferin-3A7	3 mg	P1741
Luciferin-4A	3 mg	P1621
Luciferin-4F2/3	3 mg	P1651
Luciferin-4F12	3 mg	P1661
Luciferin-2J2/4F12 (ester)	3 mg	P1671
Luciferin-MultiCYP (ester)	3 mg	P1731

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Description: The pro-luciferin substrates can be used to monitor the activity of specific isoforms of cytochrome P450 or NAT2 as indicated in the name of the substrate. The Luciferin-MultiCYP is a promiscuous substrate that reacts with at least 21 P450 isoforms and is useful for measuring net CYP activity in a mixed population of P450s. The Luciferin-NAT2 is an excellent substrate for N-acetyltransferase 2 (NAT2), a phase II biotransformation enzyme that acetylates aromatic amine groups on xenobiotic compounds. This substrate shows little to no cross-reactivity with NAT1.

Pgp-Glo™ Assay Systems

Product	Size	Cat.#
Pgp-Glo™ Assay System	10 ml	V3591
Pgp-Glo™ Assay System with P-glycoprotein	10 ml	V3601

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Description: The Pgp-Glo™ Assay Systems provide the necessary reagents for performing luminescent P-glycoprotein (Pgp) ATPase assays. Pgp, also known as MDR1 and ABCB1, is a 170kDa integral plasma membrane protein that functions as an ATP-dependent drug efflux pump and plays an important role in multidrug resistance and certain adverse drug-drug interactions. Compounds that interact with Pgp can be identified as stimulators or inhibitors of its ATPase activity. Compounds that are substrates for transport by Pgp typically stimulate its ATPase activity.

The Pgp-Glo™ Assay detects the effects of compounds on recombinant human Pgp in a cell membrane fraction. The assay relies on the ATP dependence of the light-generating reaction of firefly luciferase. ATP is first incubated with Pgp; then the Pgp ATPase reaction is stopped, and the remaining unmetabolized ATP is detected as a luciferase-generated luminescent signal. Pgp-dependent decreases in luminescence reflect ATP consumption by Pgp; thus the greater the decrease in signal, the higher the Pgp activity. Accordingly, samples containing compounds that stimulate the Pgp ATPase will have significantly lower signals than untreated samples.

Features:

- **Complete System:** Cat.# V3591 includes all the reagents required to run the assay except the P-glycoprotein: A Pgp reaction buffer, MgATP, Verapamil, Na_3VO_4, and a lyophilized ATP detection reagent and its reconstitution buffer. Cat.# V3601 includes the reagents provided in the Pgp-Glo™ System with the addition of Recombinant Human Pgp Membranes to provide a completely optimized kit.
- **Stable Activities:** "Glow-type" signal allows processing of multiple samples without concern of variability over time.
- **Low False-Positive Rate:** Use of a proprietary stabilized firefly luciferase and a proprietary luciferase assay formulation minimizes the incidence of false positives due to inhibition of luciferase by analytes when screening for compounds that affect Pgp activity.
- **Simple:** The simple protocol makes the assay amenable to high-throughput screening in multiwell plates.

Storage Conditions: Store Recombinant Human Pgp Membranes at –70°C. All other components can be stored at –70°C or –20°C, protected from light.

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MAO-Glo™ Assay Systems

Product	Size	Cat.#
MAO-Glo™ Assay	200 assays	V1401
	1,000 assays	V1402
MAO-Glo™ Assay with MAO-A	1,000 assays	V1560
Available Separately	**Size**	**Cat.#**
MAO-A	500 µl	V1452

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Description: The MAO-Glo™ Assay provides a homogeneous luminescent method for measuring monoamine oxidase (MAO) activity from recombinant and native sources and for testing the effects of test compounds on MAO activity. The MAO-Glo™ Assay is performed by incubating the MAO enzyme source with a luminogenic MAO substrate. The substrate of the MAO-Glo™ Assay is a derivative of beetle luciferin. Upon reaction with MAO, the derivative is converted into luciferin, which in turn reacts with luciferase to produce light. The amount of light produced is directly proportional to the activity of MAO.

After the MAO reaction has been performed, the reconstituted Luciferin Detection Reagent is added. The reagent simultaneously stops the MAO reaction and initiates a stable glow-type luminescent signal with a half-life greater than 5 hours. This eliminates the need for strictly timed luminescent detection.

The **MAO-Glo™ Assay with MAO-A** contains human recombinant MAO-A enzyme expressed in yeast. The kit is very well suited for the rapid assessment of potential inhibition of MAO-A by new chemical entities and can be used for higher throughput applications such as primary screening. The MAO-A enzyme is also available separately.

The MAO-Glo™ Assay includes a luminogenic MAO substrate, two MAO Reaction Buffers (one that can be used with either MAO A or MAO B enzyme and one that is designed specifically for MAO B), a lyophilized Luciferin Detection Reagent and the Luciferin Detection Buffer. The user supplies the sample material containing MAO. Protocols are configured for multiwell plate formats but easily can be adapted for single-tube applications.

Features:

- **Complete Solution:** The MAO-Glo™ Assay with MAO-A contains monoamine oxidase A enzyme for convenient assessment of the effects of new chemical entities on MAO-A activity.
- **Speed:** The luminescence format eliminates the need for time-consuming analyses such as HPLC.
- **Simplified Method:** The simple "add and read" protocol makes the assay amenable to high-throughput screening in multiwell plates.
- **Greater Sensitivity:** Less MAO enzyme is required in these assays than in typical HPLC or fluorometric methods because of the enhanced sensitivity.
- **No Fluorescence Interference:** Luminescent output eliminates interference from fluorescent test compounds.
- **Stable Signal:** "Glow-type" luminescence provides a stable signal with a half-life of greater than 5 hours. This eliminates the need for strictly timed luminescent detection.

Storage Conditions: Store MAO-A enzyme (Cat.# V1452) at –70°C. Store all other components at –20°C protected from light.

UGT Activity Assays

Product	Size	Cat.#
UGT-Glo™ Assay	200 assays	V2081
	1,000 assays	V2082
UGT-Glo™ UGT1A1 Screening System	200 assays	V2120
	1,000 assays	V2121
UGT-Glo™ UGT2B7 Screening System	200 assays	V2130
	1,000 assays	V2131

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The UGT-Glo™ Assay provides a luminescent method for measuring UDP glucuronosyltransferase (UGT) activity. The UGT-Glo™ Assay is designed to measure UGT activity from a variety of sources, such as microsomes containing recombinantly expressed enzymes or microsomal preparations derived from mammalian tissues, and to test the effects of various chemicals on UGT activity.

The assay involves incubating UGT with a proluciferin substrate; a portion of the substrate gets conjugated with UDP, while the remainder is unmodified. Upon the addition of D-Cysteine, the unconjugated proluciferin is converted into luciferin and, in a coupled reaction with luciferase/luciferin, is converted into light. Conjugated proluciferin remains intact and does not contribute to the luminescence. Thus, the signal generated is inversely correlated with UGT activity present in the sample.

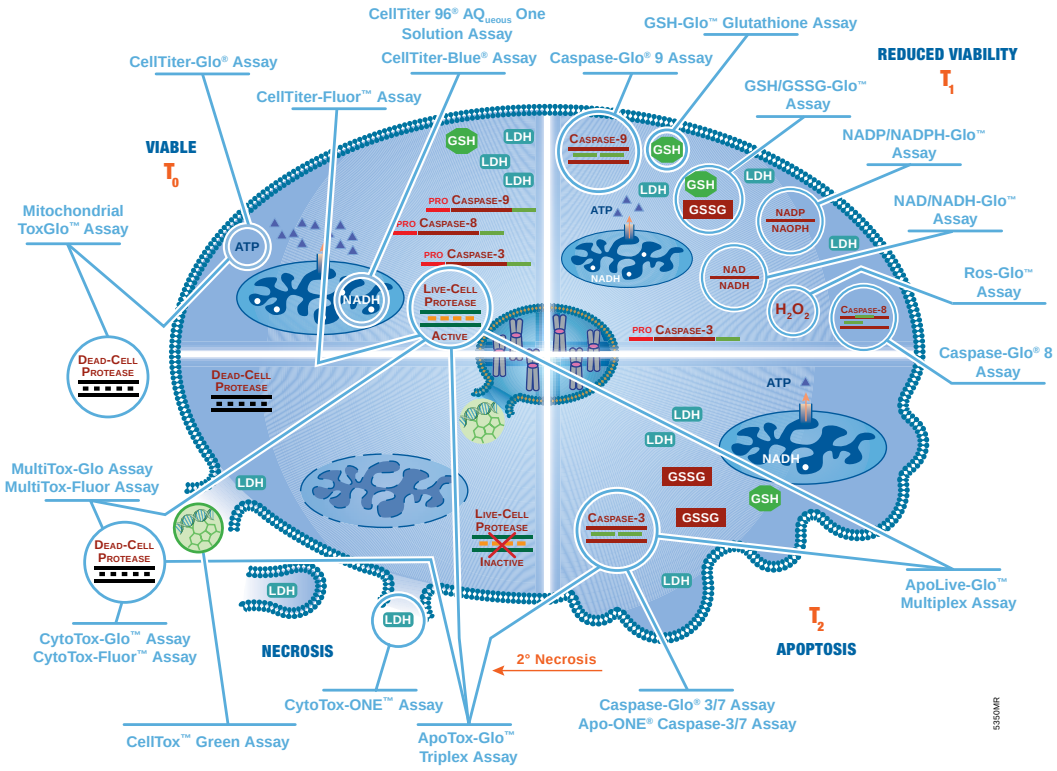
The UGT-Glo™ Assay contains two proluciferin substrates: the UGT Multi-enzyme Substrate, which is compatible with a wide range of UGTs, and the UGT1A4 Substrate, which reacts specifically with UGT1A4. The kit also contains Luciferin Detection Reagent and Reconstitution Buffer, UGT Buffer, D-Cysteine and UDPGA. The UGT-Glo™ Screening Systems contain the above reagents as well as the respective UGT isoforms and control membranes.

Features:

- **Speed:** The luminescent format eliminates the need for time-consuming analyses such as HPLC and LC/MS.
- **Simplified Method:** The simple "add and read" protocol makes the assay amenable to higher throughput screening in multiwell plates.
- **Sensitive:** Allows researchers to use less enzyme and scale down reaction volumes, which saves on reagent costs.

Storage Conditions: Store UGT enzymes and Control Membranes at –70°C. Store remaining components at –20°C.

Apoptosis Assays



Assay Type	Parameter/Biomarker Measured	Time to Results	Sensitivity (*384 well)	Plate Format	Instrument
CellTiter-Glo® Assay	Viable cell ATP	10 minutes	10 viable cells*	96/384/1536	Luminometer/CCD
CellTiter-Fluor™ Assay	Live-cell protease	0.5–3 hours	40 viable cells	96/384/1536	Fluorometer AFC 400nm$_{Ex}$/505nm$_{Em}$
CellTiter-Blue® Assay	Resazurin reduction by NADH	1–4 hours	50 cells*	96/384/1536	Fluorometer, Resorufin 560nm$_{Ex}$/590nm$_{Em}$
CellTiter 96® AQ$_{ueous}$ One Solution Assay	MTS reduction by NADH	1–4 hours	200 cells*	96/384	Spectrophotometer Abs 490nm
CellTox™ Green Assay	DNA binding by cell impermeable dye	15 minutes	50 dead cells	96/384	Fluorometer 485nm$_{Ex}$/520nm$_{Em}$ Proprietary dye
CytoTox-Glo™ Assay	Dead-cell protease release	15 minutes	10 dead cells	96/384/1536	Luminometer
CytoTox-Fluor™ Assay	Dead-cell protease release	0.5–3 hours	10 dead cells	96/384	Fluorometer R110 485nm$_{Ex}$/520nm$_{Em}$
CytoTox-ONE™ Assay	LDH release	10 minutes	200 cells*	96/384	Fluorometer, Resorufin 560nm$_{Ex}$/590nm$_{Em}$
Caspase-Glo® 3/7 Assay	Caspase-3/7 activity	0.5 hour	20 cells*	96/384/1536	Luminometer
Apo-ONE® Caspase 3/7 Assay	Caspase-3/7 activity	1–18 hours	200 cells*	96/384/1536	Fluorometer R110 499nm$_{Ex}$/521nm$_{Em}$
Caspase-Glo® 8 or 9 Assay	Caspase-8 activity	0.5 hour	~1000 cells	96	Luminometer
Mitochondrial ToxGlo™ Assay	ATP and dead-cell protease	1 hour	10 viable cells 10 dead cells	96/384	Luminometer
NAD/NADH-Glo™ Assay	Total NAD or NADH	30–60 minutes		96/384/1536	Luminometer/CCD
NADP/NADPH-Glo™ Assay	Total NADP or NADPH	30–60 minutes		96/384/1536	Luminometer/CCD
ROS-Glo™ Assay	H_2O_2	30–60 minutes		96/384	Luminometer/CCD
GSH-Glo™ Assay	GSH	30 minutes		96/384	Luminometer
GSH/GSSG-Glo™ Assay	GSH/GSSG	1 hour		96/384	Luminometer

9481LA

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ApoTox-Glo™ Triplex Assay

Product	Size	Cat.#
ApoTox-Glo™ Triplex Assay	10 ml	G6320
	5 × 10 ml	G6321

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ApoTox-Glo™ Triplex Assay combines three assay chemistries to easily assess viability, cytotoxicity and apoptosis events in the same cell-based assay well. First, viability and cytotoxicity are determined by measuring two differential protease biomarkers simultaneously with the addition of a single nonlytic reagent containing two peptide substrates. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (GF-AFC Substrate). The substrate enters intact cells, where it is cleaved to generate a fluorescent signal proportional to the number of living cells. This live-cell protease activity marker becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, cell-impermeant, fluorogenic peptide substrate (bis-AAF-R110 Substrate) is used simultaneously to measure dead-cell protease activity that has been released from cells that have lost membrane integrity. This results in ratiometric, inversely correlated measures of cell viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. A second reagent containing luminogenic DEVD-peptide substrate for caspase-3/7 and Ultra-Glo™ Recombinant Thermostable Luciferase is added. Caspase-3/7 cleavage of the substrate releases luciferin, which is a substrate for luciferase and generates light. The light output, measured with a luminometer, correlates with caspase-3/7 activation as a key indicator of apoptosis.

Features:

- **Measure Viability, Cytotoxicity and Apoptosis in the Same Sample Well:** Determine mechanism of cell death for cells in the same sample well.
- **Easily Implement:** Assay follows a simple sequential "add-mix-measure" format.
- **Normalize Data with a Built-In Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and normalizes data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Flexible and Easily Automated:** The volumes of each assay component can be scaled to meet throughput needs and is amenable to automation in 96- and 384-well plates.
- **Improves Efficiency and Saves on Lab Budget:** Reduces cell culture and labor costs by performing three assays in a single well.

Storage Conditions: Store all components at –20°C protected from light.

ApoLive-Glo™ Multiplex Assay

Product	Size	Cat.#
ApoLive-Glo™ Multiplex Assay	10 ml	G6410
	5 × 10 ml	G6411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ApoLive-Glo™ Multiplex Assay measures both the number of viable cells as a marker of cytotoxicity and caspase activation as a marker of apoptosis within a single assay well to determine the mechanism of cell death. The first part of the assay measures the activity of a protease marker of cell viability. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (glycyl-phenylalanyl-amino fluorocoumarin; GF-AFC). The substrate enters intact cells, where it is cleaved by the live-cell protease activity to generate a fluorescent signal proportional to the number of living cells. This live-cell protease becomes inactive upon loss of cell membrane integrity and leakage into the surrounding culture medium. The second part of the assay uses the Caspase-Glo® Assay technology to detect caspase activation, a key biomarker of apoptosis. The Caspase-Glo® Assay provides a luminogenic caspase-3/7 substrate, which contains the tetrapeptide sequence DEVD, in a reagent optimized for caspase activity, luciferase activity and cell lysis. Adding the Caspase-Glo® 3/7 Reagent in an 'add-mix-measure' format results in cell lysis, followed by caspase cleavage of the substrate and generation of a 'glow-type' luminescent signal produced by luciferase. Luminescence is proportional to the amount of caspase activity present.

Features:

- **Measure Viability and Apoptosis in the Same Sample Well:** Accurately determine the mechanism of cell death in less time with less sample.
- **Easy to Implement:** The assay uses a simple sequential 'add-mix-measure' format.
- **Normalize Caspase Data with Viability Control:** The ratio of caspase activity to viable cell is useful for determining the extent of caspase activation and for normalizing cell numbers.
- **Flexible and Easily Automated:** The volumes of each assay component can be scaled to meet throughput needs, and the assay is amenable to automation in 96- and 384-well plates.
- **Reveal cell death even if the window of caspase activity is missed.**
- **Multiplex with Other Assays:** The nonlytic nature of the first step of the assay allows further multiplexing with spectrally distinct fluorescent assay chemistries.

Storage Conditions: Store all components at –20°C protected from light.

Caspase-Glo® 2 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 2 Assay	10 ml	G0940
	50 ml	G0941

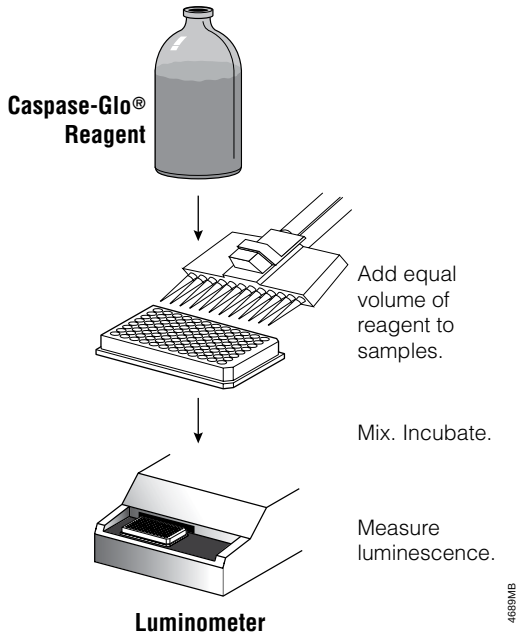
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 2 Assay is a homogeneous, luminescent assay that measures caspase-2 activity. Caspase-2 is a member of the cysteine aspartic acid-specific protease family. The Caspase-Glo® 2 Assay provides a luminogenic substrate (Z-VDVAD-aminoluciferin) in a reagent optimized for caspase-2 and luciferase activity. A single reagent is added to test samples, resulting in caspase cleavage of the substrate and generation of a glow-type luminescent signal produced by luciferase. Luminescence is proportional to the amount of caspase activity present. The assay system may be used with purified enzyme preparations and is ideal for automated high-throughput screening of inhibitors.

Features:

- **Broad Dynamic Range:** The assay is linear over four logs of caspase-2 concentration and can detect caspase-2 activity at concentrations as low as 0.2mU/ml.
- **High-Quality Assay:** The assay demonstrates an excellent Z´-factor value of 0.85 in 384-well plates using 0.05U/ml of enzyme.
- **Increased Accuracy:** The superior sensitivity over fluorescence-based caspase assays allows inhibitor studies to be performed below the K_m.
- **Batch Processing Capability:** The coupled-enzyme, homogeneous format results in a continuous signal, providing excellent stability and allowing plates to be read over an extended period of time. Luminometers with reagent injectors are not required.

Storage Conditions: Store at –20°C.



Schematic diagram of the Caspase-Glo® Assay protocol.

Available in the Helix® on-site stocking system

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Caspase-Glo® 3/7 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 3/7 Assay	2.5 ml	G8090
	10 ml	G8091
	10 × 10 ml	G8093
	100 ml	G8092

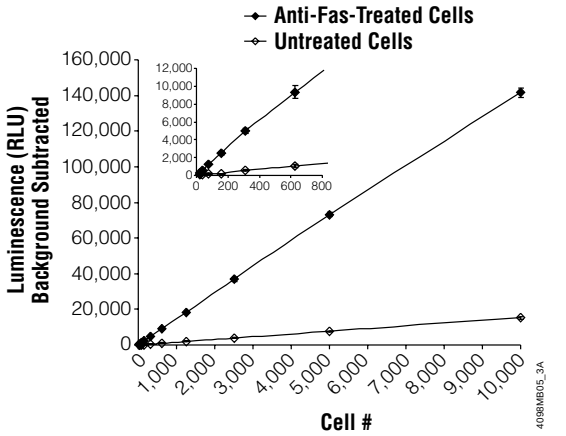
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 3/7 Assay provides a homogeneous luminescent assay that measures caspase-3/7 activities. The assay provides a proluminescent caspase-3/7 DEVD-aminoluciferin substrate and a proprietary thermostable luciferase in a reagent optimized for caspase-3/7 activity, luciferase activity and cell lysis. Adding the single Caspase-Glo® 3/7 Reagent in an "add-mix-measure" format results in cell lysis, followed by caspase cleavage of the substrate. This liberates free aminoluciferin, which is consumed by the luciferase, generating a "glow-type" luminescent signal. The signal is proportional to caspase-3/7 activity. The stabilized luciferase and proprietary buffer system improve assay performance across a wide range of assay conditions, and the assay is less likely to be affected by compound interference unlike fluorescent- or colorimetric-based assays. The Caspase-Glo® 3/7 Assay is designed for use with multiwell plate formats using either purified enzyme or cells in culture.

Features:

- **Simplify Apoptosis or Caspase Detection:** The "add-mix-measure" protocol makes the assay easy to automate; simply add an equal volume of reagent to sample volume.
- **Use Less Enzyme or Fewer Cells:** The low background luminescence results in excellent signal-to-noise ratios and superior sensitivity not achieved by other caspase formats, allowing assays to be performed in 96- or 384-well formats.
- **Decrease Assay Time:** No sample preparation or manipulation required, and no extended incubation times are necessary, as with fluorescence-based assays. Maximum sensitivity is achieved in as little as 0.25–1 hour.
- **Rely on a Performance-Tested Assay:** In cell and purified enzyme models, the assay delivers excellent Z′- factor values.
- **Process Plates in Batch Mode:** The extended-glow signal allows the plates to be read over a 3-hour period of time for batch processing; no injectors required.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.



The Caspase-Glo® 3/7 Assay produces luminescence that is linear over a broad range of cell numbers. Jurkat cells were treated with anti-Fas mAb for 4.5 hours to induce apoptosis or were left untreated. Caspase-Glo® 3/7 Reagent was added directly to the cells in 96-well plates and incubated for 1 hour before recording luminescence. Each point represents the average of 4 wells. The "no cell" blank control value has been subtracted from each.

Caspase-Glo® 6 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 6 Assay	10 ml	G0970
	50 ml	G0971

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 6 Assay is a homogeneous, luminescent assay that measures caspase-6 activity. Caspase-6 is a member of the cysteine aspartic acid-specific protease family and has a key effector role in the cleavage of specific target proteins during apoptosis. The Caspase-Glo® 6 Assay provides a luminogenic substrate, Z-VEID-aminoluciferin, in a buffer optimized for caspase-6 and luciferase activity. The addition of a single Caspase-Glo® 6 Reagent in an add-mix-measure format results in cleavage of the substrate, releasing aminoluciferin, and generation of a glow-type luminescent signal in the presence of Ultra-Glo™ Recombinant Luciferase. The luminescent signal is proportional to the amount of caspase-6 activity present. The homogeneous Caspase-Glo® 6 Assay is designed for use with purified enzyme preparations in multiwell plate formats, making it ideal for automated high-throughput screening for caspase-6 activity and inhibitors of caspase-6 activity.

Features:

- **Simplified Method:** The homogeneous "add-mix-measure" protocol makes the assay highly amenable to automation.
- **Greater Sensitivity:** The assay is more sensitive than fluorescence-based caspase-6 assays. This bioluminescent assay avoids inherent fluorescent background signals, providing excellent signal-to-noise ratios. The assay is linear over 3 logs of caspase-6 concentration and can detect 0.002U/ml.
- **Increased Accuracy:** The superior sensitivity over fluorescence-based caspase assays allows inhibitor studies at concentrations below the K_m.
- **Faster Results:** The maximum signal (and maximum sensitivity) of the assay is reached in as little as 30 minutes after reagent addition.
- **High-Quality Assay:** The assay demonstrates an excellent Z′-factor value of 0.86 when using 0.1U/ml of caspase-6 for assays in 384-well plates.
- **Batch Processing Capability:** The coupled-enzyme, homogeneous format results in a continuous signal, providing excellent stability and allowing plates to be read over an extended period of time.

Storage Conditions: Store at –20°C.

Caspase-Glo® 8 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 8 Assay	2.5 ml	G8200
	10 ml	G8201
	100 ml	G8202

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 8 Assay is a homogeneous luminescent assay that measures caspase-8 activity. The assay provides a proluminogenic caspase-8 substrate in a buffer system optimized for caspase activity, luciferase activity and cell lysis. The addition of a single Caspase-Glo® 8 Reagent in an "add-mix-read" format results in cell lysis, followed by caspase cleavage of the substrate and generation of a "glow-type" luminescent signal. The signal generated is proportional to the amount of caspase activity present. The Caspase-Glo® Reagent relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase), which generates the stable "glow-type" luminescent signal and improves performance across a wide range of assay conditions.

The system now includes a separate vial of a protease inhibitor, MG-132 Inhibitor, which may be used to reduce background, thus improving the performance of the Caspase-Glo® 8 Assay in cell-based applications.

Features:

- **Simplify Apoptosis or Caspase Detection:** The homogeneous "add-mix-read" protocol makes the assay easy to automate; simply add an equal volume of reagent to sample volume.
- **Use Less Enzyme:** The low background luminescence results in excellent signal-to-noise ratios and superior sensitivity not achieved by other caspase formats, allowing assays to be performed in 96- or 384-well formats.
- **Decrease Assay Time:** No sample preparation or manipulation required, and no extended incubation times are necessary as with fluorescent-based assays. Maximum sensitivity is achieved in as little as 0.5–1 hour.
- **Rely on a Performance-Tested Assay:** In both cell and purified enzyme models, the assay delivers excellent Z´ factors.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Experience Improved Caspase-8 Selectivity:** The Caspase-Glo® 8 Assay uses a luminogenic substrate containing the LETD sequence, which has been shown to be selective for caspase-8. The assay includes an optional proteasome inhibitor (MG-132), which when added to the Caspase-Glo® 8 Reagent significantly reduces nonspecific background in cell-based assays.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C protected from light.

Caspase-Glo® 9 Assay Systems

Product	Size	Cat.#
Caspase-Glo® 9 Assay	2.5 ml	G8210
	10 ml	G8211
	100 ml	G8212

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Caspase-Glo® 9 Assay is a homogeneous luminescent assay that measures caspase-9 activity. The assay provides a proluminogenic caspase-9 substrate in a buffer system optimized for caspase activity, luciferase activity and cell lysis. The addition of a single Caspase-Glo® 9 Reagent in an "add-mix-read" format results in cell lysis, followed by caspase cleavage of the substrate and generation of a "glow-type" luminescent signal. The signal generated is proportional to the amount of caspase activity present. The Caspase-Glo® Reagent relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase), which generates the stable "glow-type" luminescent signal and improves performance across a wide range of assay conditions.

The system now includes a separate vial of a protease inhibitor, MG-132 Inhibitor, which may be used to reduce background, thus improving the performance of the Caspase-Glo® 9 Assay in cell-based applications.

Features:

- **Simplify Apoptosis or Caspase Detection:** The homogeneous "add-mix-read" protocol makes the assay easy to automate; simply add an equal volume of reagent to sample volume.
- **Use Less Enzyme:** The low background luminescence results in excellent signal-to-noise ratios and superior sensitivity not achieved by other caspase formats, allowing assays to be performed in 96- or 384-well formats.
- **Decrease Assay Time:** No sample preparation or manipulation required, and no extended incubation times are necessary as with fluorescent-based assays. Maximum sensitivity is achieved in as little as 0.5–1 hour.
- **Rely on a Performance-Tested Assay:** The assay delivers excellent Z´ factors in cell and purified enzyme models.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Experience Improved Caspase-9 Selectivity:** The Caspase-Glo® 9 Assay uses a luminogenic substrate containing the LEHD sequence, which has been shown to be selective for caspase-9. The assay includes an optional proteasome inhibitor (MG-132), which when added to the Caspase-Glo® 9 Reagent significantly reduces nonspecific background in cell-based assays.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C protected from light.

Apo-ONE® Homogeneous Caspase-3/7 Assay

Product	Size	Cat.#
Apo-ONE® Homogeneous Caspase-3/7 Assay	1 ml	G7792
	10 ml	G7790
	100 ml	G7791
Available Separately	**Size**	**Cat.#**
Apo-ONE® Homogeneous Caspase-3/7 Buffer	100 ml	G7781

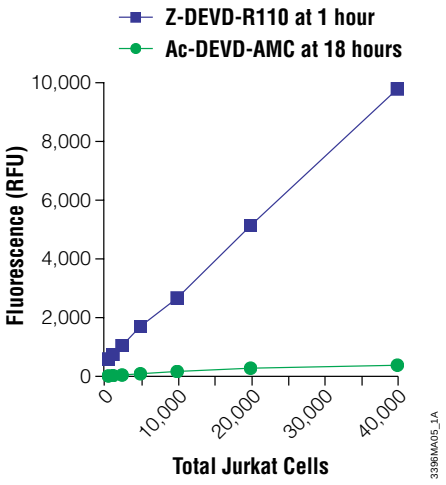
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Apo-ONE® Homogeneous Caspase-3/7 Assay provides the necessary reagents for fast and sensitive measurement of active caspase-3 and -7 in a homogeneous format. The assay includes a profluorescent caspase-3/7 consensus substrate, rhodamine 110 bis-(N-CBZ-L-aspartyl-L-glutamyl-L-valyl-aspartic acid amide) (Z-DEVD-R110), and an optimized bifunctional cell lysis/activity buffer. The buffer efficiently lyses cultured mammalian cells and supports optimal caspase-3/7 enzymatic activity. The substrate and buffer are combined to make the Apo-ONE® Caspase-3/7 Reagent that is added directly to samples. Upon cleavage on the C-terminal side of the aspartate residue in the DEVD peptide substrate sequence by caspase-3/7 enzymes, the rhodamine 110 becomes fluorescent when excited at a wavelength of 498nm. The emission maximum is 521nm. The amount of fluorescent product generated is representative of the amount of active caspase-3/7 present in the sample.

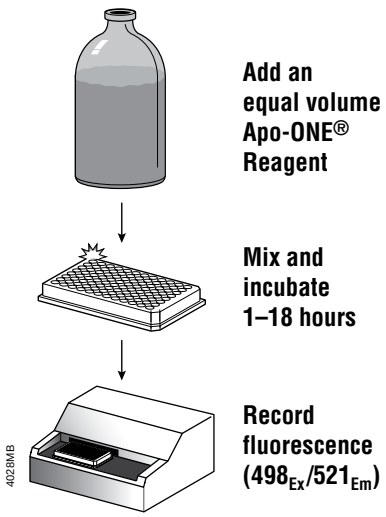
Features:

- **Get Results Faster:** The simple "add-mix-measure" format combined with the high sensitivity of the assay dramatically decreases the "time to first result" by eliminating cumbersome sample preparation and lengthy incubation steps.
- **Use Less Enzyme or Fewer Cells:** Optimized caspase-3/7 activity buffer, in conjunction with the R110-labeled substrate, allows for increased sensitivity over existing fluorescent caspase assay methods.
- **Adapt Format and Throughput:** The assay can be flexibly configured (from cuvette to 384-well plate) for use in high-throughput systems by maintaining a 1:1 ratio of sample to assay reagent and may be used with purified enzyme preparations, cell extracts or cultures of adherent, suspension or primary cells.
- **Get More Information:** Perform more than one assay on the same sample. This assay can be multiplexed with other assay methods such as the CellTiter-Blue® Assay (Cat.# G8080) or the Caspase-Glo® 8 or 9 Assays (Cat.# G8200 or G8210).
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

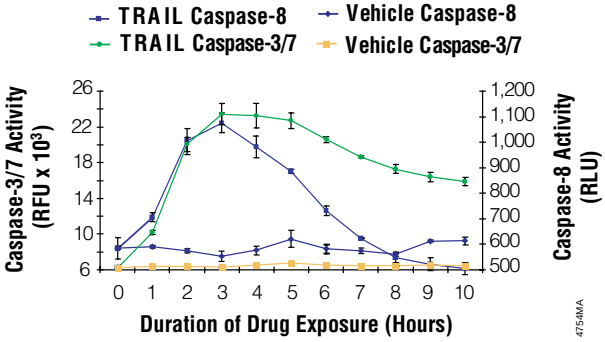
Storage Conditions: Store at –20°C protected from light and moisture.



Superior sensitivity of the Apo-ONE® Homogeneous Caspase-3/7 Assay compared to the AMC substrate-based assay.



Schematic overview of the Apo-ONE® Homogeneous Caspase-3/7 Assay protocol.



Multiplexing luminescent Caspase-Glo® 8 and Apo-ONE® Caspase-3/7 Assay. The time dependence of caspase-8 and caspase-3/7 activity is demonstrated.

CaspACE™ Assay System, Colorimetric

Product	Size	Cat.#
CaspACE™ Assay System, Colorimetric	50 assays	G7351
	100 assays	G7220

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CaspACE™ Assay System, Colorimetric, provides reagents for measuring the activity of caspase-3. The system includes a colorimetric substrate and a cell-permeant inhibitor that allow quantitative measurement of caspase-3 (DEVDase) protease activity. The colorimetric substrate (Ac-DEVD-pNA) provided is labeled with the chromophore *p*-nitroaniline (pNA). pNA is released from the substrate upon cleavage by DEVDase. Free pNA produces a yellow color that is monitored by a spectrophotometer at 405nm. The amount of yellow color produced upon cleavage is proportional to the amount of DEVDase activity present in the sample.

The potent, irreversible and cell-permeant pan-caspase inhibitor Z-VAD-FMK is provided in the CaspACE™ Assay System, Colorimetric. The addition of the Z-VAD-FMK Inhibitor prior to the induction of apoptosis in cell culture inhibits the activation of the caspase cascade, including caspase-3.

Features:

- **Timely:** Measures an early indicator of apoptosis.
- **Quantitative or Qualitative:** Determine total caspase-3 activity or screen for inducers or inhibitors of caspase activity.
- **Versatile:** May be used with purified enzyme preparations, cell extracts or tissue lysates.

Storage Conditions: Store at –20°C. Store substrates and inhibitors in aliquots at –20°C away from light and moisture.

CaspACE™ FITC-VAD-FMK In Situ Marker

Product	Size	Cat.#
CaspACE™ FITC-VAD-FMK In Situ Marker	50 µl	G7461
	125 µl	G7462

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: CaspACE™ FITC-VAD-FMK In Situ Marker is a fluorescent analog of the pan caspase inhibitor Z-VAD-FMK (carbobenzoxy-valyl-alanyl-aspartyl-[O-methyl]-fluoromethylketone). The fluorescein isothiocyanate (FITC) group has been substituted for the carbobenzoxy (Z) N-terminal blocking group to create the fluorescent apoptosis marker. This structure allows delivery of the inhibitor into the cell where it irreversibly binds to activated caspases. The FITC label allows for a single-reagent addition to assay for caspase activity in situ. The FITC-VAD-FMK is supplied as a 5mM solution in DMSO and is intended for in situ monitoring of caspase activity by fluorescence detection. The suggested concentration for use in anti-Fas-treated Jurkat cell culture is 10µM.

Features:

- **Simplify Your Protocol:** Add FITC-VAD-FMK, incubate, wash and view fluorescence.
- **Use a Variety of Detection Methods:** Detect apoptotic cells by fluorescence microscopy or flow cytometry; combine with other immunomarkers to assess cell populations or determine apoptotic frequency within a population; adaptable to high-throughput applications.
- **Get Results Faster:** Quick, single-reagent addition to cell culture; no preparation of cell extracts or long incubation steps. Use as a preliminary screen for apoptosis.
- **Get Reliable Results:** Synthesized peptide provides consistent results from every batch, unlike Annexin V, which can be highly variable between batches.
- **Use With Live Cells:** Easily moves in and out of cells and remains anchored inside cultured apoptotic cells.

Storage Conditions: Store at –20°C protected from light and moisture.

DeadEnd™ Colorimetric TUNEL System

Product	Size	Cat.#
DeadEnd™ Colorimetric TUNEL System	20 reactions	G7360
	40 reactions	G7130

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DeadEnd™ Colorimetric TUNEL System is a modified TUNEL Assay designed to provide simple, accurate and rapid detection of apoptotic cells in situ at the single-cell level. The DeadEnd™ Colorimetric TUNEL System measures nuclear DNA fragmentation, an important biochemical indicator of apoptosis. The system can be used to assay apoptotic cell death in both tissue sections and cultured cells. The DeadEnd™ Colorimetric TUNEL System end-labels the fragmented DNA of apoptotic cells using a modified TUNEL (TdT-mediated dUTP Nick-End Labeling) assay. Biotinylated nucleotide is incorporated at the 3´-OH DNA ends using the enzyme Terminal Deoxynucleotidyl Transferase (TdT). Horseradish-peroxidase-labeled streptavidin (Streptavidin HRP) is then bound to these biotinylated nucleotides, which are detected using the peroxidase substrate, hydrogen peroxide, and the stable chromogen, diaminobenzidine (DAB). Using this procedure, apoptotic nuclei are stained dark brown.

Note: The protocol for the DeadEnd™ TUNEL Assay recommends an optional DNase I treatment of samples as a positive control to detect DNA fragmentation. RQ1 RNase-Free DNase (Cat.# M6101) can be used to generate the positive control and is available separately.

Features:

- **Assay Cells or Tissue:** Detect apoptosis in thick tissue sections or assess cell morphology.
- **Simplify:** Includes DAB substrate and H_2O_2 for color detection and plastic coverslips that simplify sample handling.
- **Proven Applications:** Vibratome® sections of neuronal tissue, Jurkat cells, HL-60 cells.

Storage Conditions: Store the Equilibration Buffer, TdT Enzyme, Biotinylated Nucleotide Mix and Proteinase K at –20°C. Store the Streptavidin HRP, DAB 20X Chromogen, DAB Substrate 20X Buffer and Hydrogen Peroxide 20X at 4°C. Store the SSC 20X and Plastic Coverslips at room temperature.

Available in the Helix® on-site stocking system
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DeadEnd™ Fluorometric TUNEL System

Product	Size	Cat.#
DeadEnd™ Fluorometric TUNEL System	60 reactions	G3250

For Research Use Only. Not for Use in Diagnostic Procedures.

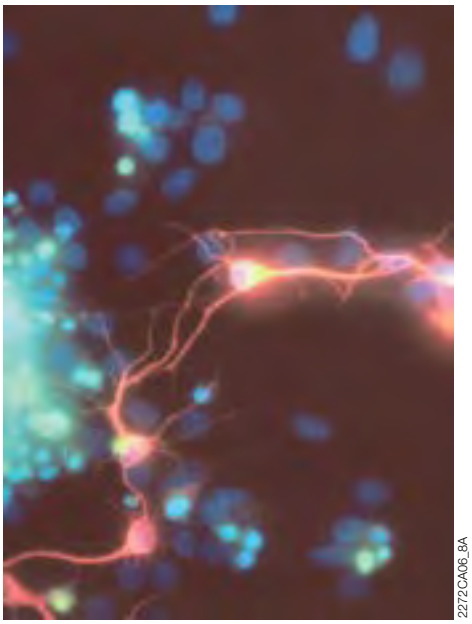
Description: The DeadEnd™ Fluorometric TUNEL System is a classic TUNEL Assay designed for the specific detection and quantitation of apoptotic cells within a cell population. The DeadEnd™ Fluorometric TUNEL System measures nuclear DNA fragmentation, an important biochemical hallmark of apoptosis in many cell types. The system is non-radioactive and provides simple, accurate and rapid detection of apoptotic cells in situ at the single-cell level or in cell suspensions. The DeadEnd™ Fluorometric TUNEL System measures the fragmented DNA of apoptotic cells by catalytically incorporating fluorescein-12-dUTP at 3′-OH DNA ends using the enzyme Terminal Deoxynucleotidyl Transferase (TdT), which forms a polymeric tail using the principle of the TUNEL (TdT-mediated dUTP Nick-End Labeling) assay. The fluorescein-12-dUTP-labeled DNA can then be visualized directly by fluorescence microscopy or quantitated by flow cytometry.

Note: The protocol for the DeadEnd™ TUNEL Assay recommends an optional DNase I treatment of samples as a positive control to detect DNA fragmentation. RQ1 RNase-Free DNase (Cat.# M6101) can be used to generate the positive control and is available separately.

Features:

- **Save Money:** System provides sufficient reagents for 60 assays of 50µl each.
- **Save Time:** Direct incorporation of fluorescent nucleotide reduces number of incubation steps.
- **Choose Sample Type:** Use to detect apoptosis in cultured cells and formalin-fixed, paraffin-embedded tissue sections.
- **Convenient:** Plastic coverslips provided simplify sample handling.

Storage Conditions: Store at –20°C. Store the Nucleotide Mix protected from light at –20°C.



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Neural progenitor cells migrating away from a spherical cluster of apoptotic cells. The condensed nuclei (green) contain fragmented DNA, as indicated by fluorescent labeling with the DeadEnd™ Fluorometric TUNEL System, in contrast with larger intact nuclei stained with DAPI (blue). The cells were also processed for immunocytochemical staining using a primary antibody to βIII Tubulin (Cat.# G7121) and a Cy®3-conjugated secondary antibody where immature process-bearing neurons (red) are distinctly labeled.

Caspase Inhibitor Z-VAD-FMK

Product	Size	Cat.#
Caspase Inhibitor Z-VAD-FMK, 20mM	50 µl	G7231
	125 µl	G7232

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Z-VAD-FMK (carbobenzoxy-valyl-alanyl-aspartyl-[O-methyl]-fluoromethylketone) is a cell-permeant pan caspase inhibitor that irreversibly binds to the catalytic site of caspase proteases and can inhibit induction of apoptosis. For inhibition of apoptosis, Z-VAD-FMK should be added at the same time that apoptosis is induced. Z-VAD-FMK is provided at 20mM in DMSO for convenient addition to cell culture or extracts. The peptide is O-methylated in the P1 position on aspartic acid, providing enhanced stability and increased cell permeability. The suggested concentration for use in the anti-Fas mAb-treated Jurkat cell culture model system is 20µM.

Storage Conditions: Store at –20°C protected from light and moisture.

Caspase Inhibitor Ac-DEVD-CHO

Product	Size Conc.	Cat.#
Caspase Inhibitor Ac-DEVD-CHO	100 µl 10 mM	G5961

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Ac-DEVD-CHO is an inhibitor of caspase-3/7 (DEVDase) activity. The concentration of inhibitor required to inhibit caspase activity must be determined empirically for each system. Ten micromolar inhibitor is sufficient to inhibit caspase activity in extracts of apoptotic THP-1 cells. Ac-DEVD-CHO is supplied as a 10mM solution in DMSO.

Storage Conditions: Store at –20°C protected from light and moisture.

Digitonin

Product	Size Conc.	Cat.#
Digitonin	40 µl 20 mg/ml in DMSO	G9441

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Digitonin is a detergent solution useful for permeabilizing cells and for creating a cytotoxicity chemistry positive control.

Storage Conditions: Store at -20°C protected from light.

Anti-ACTIVE® Caspase-3 pAb

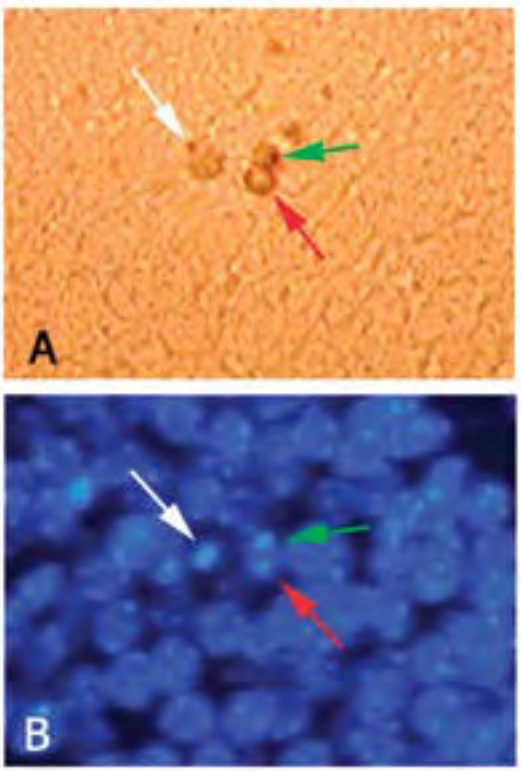
Product	Size	Cat.#
Anti-ACTIVE® Caspase-3 pAb	50 µl	G7481
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Anti-ACTIVE® Caspase-3 pAb is intended for use as a marker of apoptosis; it specifically stains apoptotic cells without staining nonapoptotic cells. Includes sufficient antibody to perform 125 immunocytochemical assays (100µl/assay) at a 1:250 dilution.

Features:

- **Immunogen:** Peptide derived from the p17 fragment of caspase-3 and having sequence homology in human, mouse, rat and hamster.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in Dulbecco's PBS.
- **Specificity:** Specifically recognizes the cleaved active form of caspase-3 in human, rat and mouse.

Storage Conditions: Store at –20°C.



Demonstration of Anti-ACTIVE® Caspase-3 pAb positive cells in postnatal day 0 (P0) mouse brain paraffin-embedded sections. Panel A. Three Anti-ACTIVE® Caspase-3 pAb-positive cells (colored arrows). **Panel B.** Corresponding DAPI-stained nuclei. Note the correspondence of Anti-ACTIVE® Caspase-3 pAb label with the typical apoptotic, condensed nuclear morphology in Panel B. Protocols developed and performed at Promega.

Anti-PARP p85 Fragment pAb

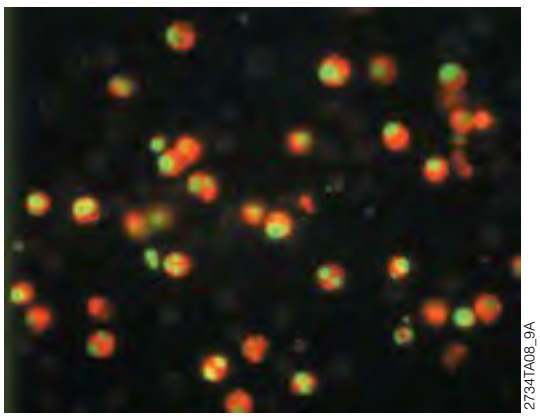
Product	Size	Cat.#
Anti-PARP p85 Fragment pAb	50 µl	G7341
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Poly (ADP-ribose) polymerase (PARP), a nuclear enzyme involved in DNA repair, is a well known substrate for caspase-3 cleavage during apoptosis. Anti-PARP p85 Fragment pAb is a rabbit polyclonal antibody specific for the p85 fragment of PARP that results from caspase cleavage of the 116kDa intact molecule and thus provides an in situ marker for apoptosis. The antibody is affinity-purified using a peptide that corresponds to a region of the p85 fragment of PARP. The PARP immunogen is a synthetic peptide, gly-val-asp-glu-val-ala-lys (GVDEVAK), representing the N-terminus of the large C-terminal fragment of human PARP that results from caspase-3 cleavage. Each batch of antibody is quality assurance tested for use in immunostaining applications and contains sufficient antibody for 50 immunocytochemical reactions at the suggested working dilution of 1:100.

Features:

- **Immunogen:** N-terminal peptide from p85 fragment.
- **Antibody Form:** Affinity-purified rabbit polyclonal antibody provided in Dulbecco's PBS.
- **Specificity:** Specifically detects PARP p85 fragment in human, rat and bovine cells and tissues. Does not recognize the 116kDa intact PARP protein.

Storage Conditions: Store at –20°C.



Anti-PARP p85 Fragment pAb and TUNEL double-labeling of apoptotic Jurkat cells. Cells were labeled with the Anti-PARP p85 Fragment pAb (red) and the DeadEnd™ Fluorometric TUNEL System (Cat.# G3250; green). The colocalization of cleaved PARP in cells containing TUNEL-positive nuclei demonstrates that the Anti-PARP p85 Fragment pAb specifically labels apoptotic cells. Protocols developed and performed at Promega.

Available in the Helix® on-site stocking system

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Cell Viability Assays

CellTiter-Glo® Luminescent Cell Viability Assay

Product	Size	Cat.#
CellTiter-Glo® Luminescent Cell Viability Assay	10 ml	G7570
	10 × 10 ml	G7571
	100 ml	G7572
	10 × 100 ml	G7573

For Research Use Only. Not for Use in Diagnostic Procedures.

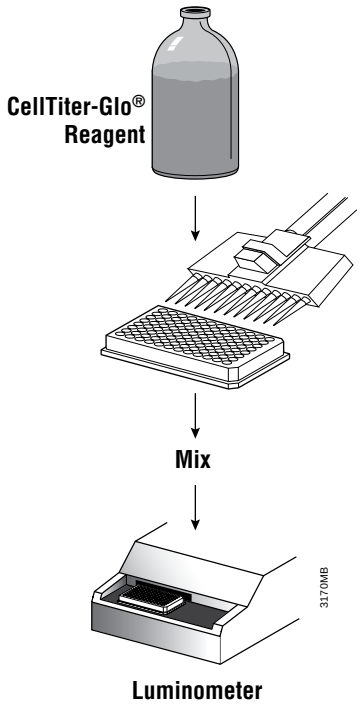
Description: The CellTiter-Glo® Luminescent Cell Viability Assay is a homogeneous method of determining the number of viable cells in culture based on quantitation of the ATP present, an indicator of metabolically active cells. The CellTiter-Glo® Assay is designed for use with multiwell formats, making it ideal for automated high-throughput screening (HTS), cell proliferation and cytotoxicity assays. The assay protocol involves adding a single CellTiter-Glo® Reagent directly to cells cultured in serum-supplemented medium. Cell washing, removal of medium and multiple pipetting steps are not required. The system detects as few as 15 cells/well in a 384-well format in 10 minutes after adding reagent and mixing.

The homogeneous "add-mix-measure" format results in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The amount of ATP is directly proportional to the number of cells present in culture. The CellTiter-Glo® Assay generates a "glow-type" luminescent signal, which has a half-life generally greater than five hours, depending on cell type and medium used. The extended half-life eliminates the need to use reagent injectors and provides flexibility for continuous or batch mode processing of multiple plates. The unique homogeneous format avoids errors that may be introduced by other ATP measurement methods that require multiple steps.

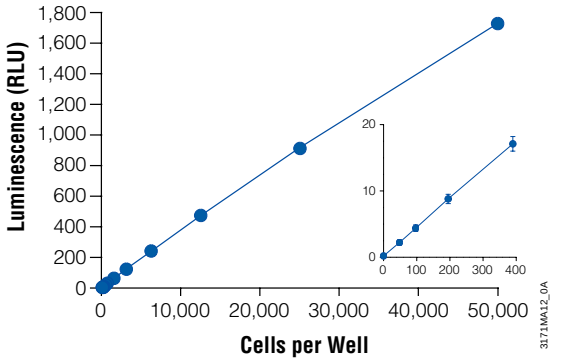
Features:

- **Simplify Cell Viability Assays:** Homogeneous "add-mix-measure" format dramatically reduces the number of plate handling steps required for similar assays.
- **Use Fewer Cells:** Detects as few as 15 cells/well in a 384-well format or 50 cells/well in a 96-well format. Accurately measures cells at numbers below the detection limits of standard colorimetric and fluorometric assays. Reduces the number of cells required per assay.
- **Get Results Quickly:** Data can be recorded 10 minutes after adding reagent.
- **Choose Your Format:** Can be used with various multiwell formats. Data can be recorded by luminometer or CCD camera imaging device.
- **Process Plates Consecutively:** Luminescent signal is very stable, with a half-life generally >5 hours, dependent on cell type and medium used, allowing batch processing; delivers excellent Z´-factor values for screening applications.
- **Get More Information:** Multiplex with other cell-based assays from Promega.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized CellTiter-Glo® Substrate and CellTiter-Glo® Buffer should be stored at –20°C. Reconstituted CellTiter-Glo® Reagent can be stored at 4°C for 48 hours with ~5% loss of activity or at 4°C for 4 days with ~20% loss of activity.



Flow diagram showing preparation and use of CellTiter-Glo® Reagent.



Excellent sensitivity and extended linearity. Serial twofold dilutions of Jurkat cells were made in RPMI 1640 and 10% PBS in a 96-well plate. The assay was performed as described in Technical Bulletin #TB288. Values represent the mean ± S.D. of four replicates for each cell number.

CellTiter-Glo® One Solution Assay

Product	Size	Cat.#
CellTiter-Glo® One Solution Assay	100 ml	G8461
	500 ml	G8462

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Glo® One Solution Assay is a homogeneous method of determining the number of viable cells in culture based on quantitation of the ATP present, which indicates the presence of metabolically active cells. This frozen, ready-to-use format is based on the original CellTiter-Glo® Luminescence Cell Viability Assay chemistry and eliminates the need to combine buffer with lyophilized substrate when preparing reagent. The CellTiter-Glo® Assay is designed for use with multiwell-plate formats, making it ideal for automated high-throughput screening (HTS) in 96- to 1536-well format, and cell proliferation and cytotoxicity assays.

The homogeneous "add-mix-measure" format results in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The amount of ATP is directly proportional to the number of cells present in culture. The CellTiter-Glo® One Solution Assay generates a stable "glow-type" luminescent signal with a half-life of greater than three hours. This extended half-life eliminates the need for reagent injectors and provides flexibility for continuous or batch-mode processing of multiple plates.

Features:

- **Convenient:** No reagent preparation is required; simply thaw and "add-mix-measure". Volumes convenient for HTS applications.
- **Homogeneous:** "Add-mix-measure" format reduces the number of plate-handling steps.
- **Fast:** Data can be recorded 10 minutes after reagent addition.
- **Sensitive:** Measures cells at numbers below the detection limits of standard colorimetric and fluorometric assays.
- **Flexible:** Can be used with various multiwell formats (96-, regular or low-volume 384- and 1536-well plates). Data can be recorded by luminometer or CCD camera imaging device.
- **Robust:** Stable luminescent signal with a half-life >3 hours, depending on cell type and culture medium used.
- **Ability to Multiplex:** Can be used with other nonlytic compatible assay chemistries from Promega.

Storage Conditions: Store the CellTiter-Glo® One Solution Assay below –10°C. CellTiter-Glo® One Solution Assay can be stored at 4°C for 48 hours or at 22°C for 10 hours with ~10–12% loss of activity. CellTiter-Glo® One Solution Assay can withstand two additional freeze-thaw cycles after the first thaw, with approximately 10% loss of activity with each additional freeze-thaw cycle.

BacTiter-Glo™ Microbial Cell Viability Assay

Product	Size	Cat.#
BacTiter-Glo™ Microbial Cell Viability Assay	10 ml	G8230
	10 × 10 ml	G8231
	100 ml	G8232
	10 × 100 ml	G8233
Available Separately	**Size Conc.**	**Cat.#**
rATP, 10mM	0.5 ml mM	P1132

G8230, G8231, G8232, G8233 For Research Use Only. Not for Use in Diagnostic Procedures. P1132 For Laboratory Use.

Description: The BacTiter-Glo™ Microbial Cell Viability Assay is a homogeneous method for determining the number of viable microbial cells in culture based on quantitation of the ATP present. ATP is an indicator of metabolically active cells. The homogeneous assay procedure involves adding a single reagent (BacTiter-Glo™ Reagent) directly to bacterial cells cultured in medium and measuring luminescence. The homogeneous format reduces pipetting errors that may be introduced during the multiple steps required by other methods of ATP measurement. The formulation of the reagent supports bacterial cell lysis and generation of a luminescent signal in a homogeneous "add-mix-measure" format. The luminescent signal is proportional to the amount of ATP present, which is directly proportional to the number of viable cells in culture. The assay relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase) and a proprietary buffer formulation for extracting ATP from bacteria. The assay has been shown to detect a variety of bacteria and fungi.

Features:

- **Simplify Microbial Detection:** The "add-mix-measure" format reduces the number of handling steps to fewer than that required for similar ATP assays, with no separate lysis step, and no injectors required, allowing easy automation.
- **Get Results Quickly:** Data can be recorded in 5 minutes or less after adding reagent and mixing. Superior sensitivity allows you to detect growth or toxicity quickly after inoculation.
- **Increase Your Sensitivity:** Measure ATP from as few as 10 bacterial cells, 1,000-fold more sensitive than absorbance (O.D.) readings.
- **Choose Your Format:** Can be used with various multiwell-plate or single-use formats. Data can be recorded by luminometer or CCD camera.
- **Process Plates Consecutively:** The "glow-type" luminescent signal is stable, with a half-life generally over 30 minutes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized BacTiter-Glo™ Substrate and BacTiter-Glo™ Buffer should be stored at –20°C.

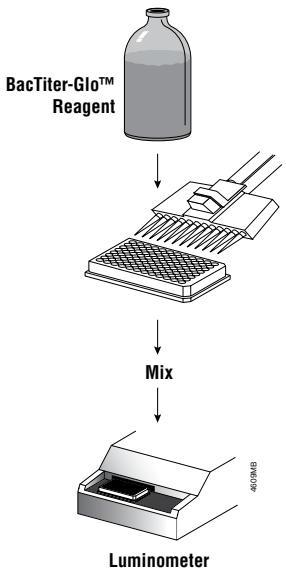
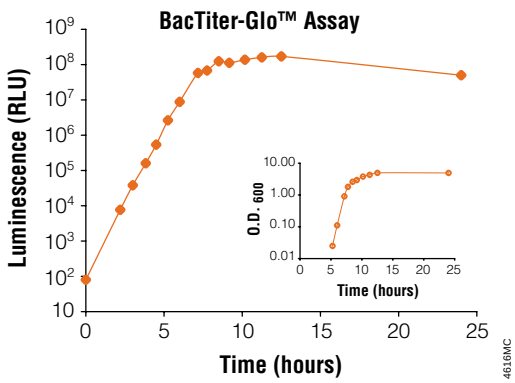


Diagram of the BacTiter-Glo™ Microbial Cell Viability Assay protocol.



Evaluate bacterial growth immediately after inoculation using the BacTiter-Glo™ Assay. When measuring growth by O.D., the first significant measurement (0.25 O.D. with *E. coli*) did not occur until 5 hours after inoculation.

Available in the Helix® on-site stocking system

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Fluorescent Cell Viability Assay

Product	Size	Cat.#
CellTiter-Fluor™ Cell Viability Assay	10 ml	G6080
	5 × 10 ml	G6081
	2 × 50 ml	G6082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Fluor™ Cell Viability Assay is a nonlytic, single-reagent-addition fluorescence assay that measures the relative number of viable cells in a population. The assay is based on measurement of a conserved and constitutive protease activity within live cells and therefore serves as a biomarker of cell viability. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (Gly-Phe-AFC). The substrate enters intact cells, where it is cleaved by the live-cell protease activity to generate a fluorescent signal proportional to the number of living cells. The live-cell protease becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium.

The CellTiter-Fluor™ Assay also can be used in a single-well, sequential, multiplex format with other downstream assay chemistries to normalize data by cell number. Data from the assay can serve as an internal control and allow identification of errors resulting from cell clumping or compound cytotoxicity. The assay is compatible with many Promega luminescence assays or spectrally distinct fluorescence assay methods, such as measuring caspase activation, reporter gene expression or orthogonal measures of viability.

Features:

- **Obtain Better Data from Every Well:** The assay can be performed in multiplex with many Promega luminescence assays or spectrally distinct fluorescence assays.
- **Normalize Data for Cell Number:** Normalizing data for live-cell number makes results more comparable well-to-well, plate-to-plate, day-to-day.
- **Save on Cell Culture Costs:** Multiplexing assays in the same well eliminates parallel plate processing, thus reducing cell culture costs.

Storage Conditions: Store at –20°C.

CellTiter 96® AQ_{ueous} One Solution Cell Proliferation Assay (MTS)

Product	Size	Cat.#
CellTiter 96® AQ_{ueous} One Solution Cell Proliferation Assay	200 assays	G3582
	1,000 assays	G3580
	5,000 assays	G3581

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter 96® AQ_{ueous} One Solution Cell Proliferation Assay is a colorimetric method for determining the number of viable cells in proliferation, cytotoxicity or chemosensitivity assays. The CellTiter 96® AQ_{ueous} One Solution Reagent contains a tetrazolium compound [3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium, inner salt; MTS] and an electron coupling reagent (phenazine ethosulfate; PES). PES has enhanced chemical stability, which allows it to be combined with MTS to form a stable solution. The CellTiter 96® AQ_{ueous} Assay uses phenazine methosulfate (PMS) as the electron coupling reagent, and PMS Solution and MTS Solution are supplied separately. PES has enhanced chemical stability, which allows it to be combined with MTS to form a stable solution.

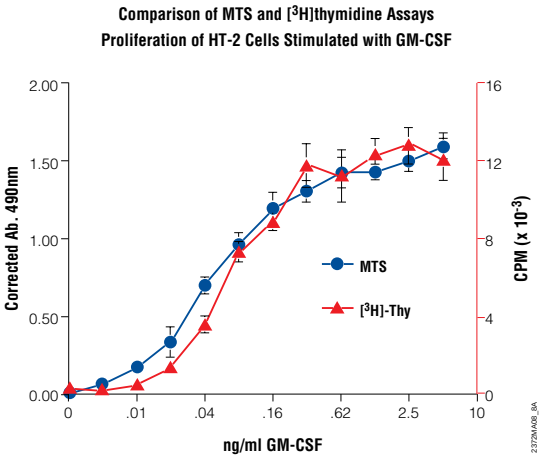
Assays are performed by adding a small amount of the CellTiter 96® AQ_{ueous} One Solution Reagent directly to culture wells, incubating for 1–4 hours and then recording absorbance at 490nm with a 96-well plate reader. The quantity of formazan product as measured by the amount of 490nm absorbance is directly proportional to the number of living cells in culture.

If you currently use a [^{3}H]-thymidine incorporation assay, addition of the CellTiter 96® AQ_{ueous} One Solution Reagent can be substituted for the pulse of [^{3}H]-thymidine at the time point in the assay when the pulse of radioactive thymidine is usually added. Previous bioassay data comparing [^{3}H]-thymidine incorporation to the MTS-based CellTiter 96® AQ_{ueous} Assay and the original MTT-based CellTiter 96® Assay demonstrate that tetrazolium reagents can be substituted for [^{3}H]-thymidine incorporation.

Features:

- **Simplify Colorimetric Viability Assays:** "Add-incubate-measure" format (single-step reagent addition) enables design of homogeneous high-throughput screening assays.
- **Use a Single Solution:** Use as a single solution, filter sterilized and ready to add to assay plates (unlike MTT).
- **Perform Fewer Steps:** Perform the assay in 96-well plates with no washing or cell harvesting. Also eliminates solubilization steps normally required for MTT assays.
- **Gain Flexibility:** Plates can be read and returned to incubator for further color development (unlike MTT).
- **Avoid Organic Solvents:** Requires no volatile organic solvent to solubilize the formazan product (unlike MTT).
- **Non-Radioactive:** Requires no scintillation cocktail or radioactive waste disposal (unlike [^{3}H]-thymidine incorporation assays).
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C, protected from light.



Measurement of GM-CSF-stimulated proliferation in HT-2 cells using the CellTiter 96® AQ_{ueous} Cell Proliferation Assay and a [^{3}H]thymidine incorporation assay. Similar results were obtained with both assays.

CellTitle 96® AQ_{ueous} Non-Radioactive Cell Proliferation Assay (MTS)

Product	Size	Cat.#
CellTiter 96® AQ_{ueous} Non-Radioactive Cell Proliferation Assay	1,000 assays	G5421
	5,000 assays	G5430
	50,000 assays	G5440
Available Separately	**Size**	**Cat.#**
CellTiter 96® AQ_{ueous} MTS Reagent Powder	1 g	G1111
	250 mg	G1112

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter 96® AQ_{ueous} Non-Radioactive Cell Proliferation Assay is a homogeneous, colorimetric method for determining the number of viable cells in proliferation, cytotoxicity or chemosensitivity assays. The CellTiter 96® AQ_{ueous} Assay is composed of solutions of a novel tetrazolium compound [3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium, inner salt; MTS] and an electron coupling reagent (phenazine methosulfate) PMS. MTS is bioreduced by cells into a formazan product that is soluble in tissue culture medium. The absorbance of the formazan product at 490nm can be measured directly from 96-well assay plates without additional processing. The conversion of MTS into the aqueous soluble formazan product is accomplished by dehydrogenase enzymes found in metabolically active cells. The quantity of formazan product as measured by the amount of 490nm absorbance is directly proportional to the number of living cells in culture.

If you currently use a [^{3}H]-thymidine incorporation assay, addition of the combined MTS/PMS solution can be substituted for [^{3}H]-thymidine at the time point in the assay when the pulse of radioactive thymidine is usually added. Data from proliferation bioassays comparing the CellTiter 96® AQ_{ueous} Assay and [^{3}H]-thymidine incorporation show similar results. This is in agreement with similar radioactivity incorporation studies performed using the original CellTiter 96® Assay.

CellTiter 96® AQ_{ueous} MTS Reagent Powder is a novel tetrazolium compound for use in colorimetric assays for determining the number of viable cells in proliferation, cytotoxicity or chemosensitivity assays. It is provided in powdered form.

Features:

- **Easy to Use:** Combine provided MTS and PMS solutions, add to cells, incubate and read absorbance.
- **Fast:** Perform assay in a 96-well plate with no washing or cell harvesting. Also eliminates solubilization steps because the MTS formazan product is soluble in tissue culture medium.
- **Non-Radioactive:** Requires no scintillation cocktail or radioactive waste disposal (unlike [^{3}H]-thymidine).
- **Flexible:** Plates can be read and returned to incubator for further color development (unlike MTT).
- **Safe:** Requires no volatile organic solvent to solubilize the formazan product (unlike MTT).

Storage Conditions: For long-term storage, store MTS and PMS Solutions at –20°C, protected from light.

CellTiter 96® Non-Radioactive Cell Proliferation Assay (MTT)

Product	Size	Cat.#
CellTiter 96® Non-Radioactive Cell Proliferation Assay	1,000 assays	G4000
	5,000 assays	G4100

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter 96® Assay is a collection of qualified reagents that provide a convenient method for determining viable cell number. The CellTiter 96® Assay is a modification of the MTT assay method described by Mosmann and incorporates several improvements to the method that address previous technical problems including: 1) serum protein precipitation caused by adding organic solvent; 2) interference by phenol red; 3) incomplete solubilization of the formazan crystals resulting in lower sensitivity; and 4) stability of the colored product.

The CellTiter 96® Assay is performed by adding a premixed, optimized Dye Solution to culture wells of a 96-well plate, usually containing various concentrations of growth factor or test substance. During a 4-hour incubation, living cells convert the MTT tetrazolium component of the Dye Solution into a formazan product. If you currently use a [^{3}H]-thymidine incorporation assay, the addition of Dye Solution can be substituted for the pulse of radioactive thymidine at the time point in the assay when the pulse of [^{3}H]-thymidine is usually added. The Solubilization/Stop Solution is then added to the culture wells to solubilize the formazan product, and the absorbance at 570nm is recorded using a 96-well plate reader. In addition, direct comparison between [^{3}H]-thymidine incorporation and tetrazolium conversion have demonstrated less than a 5% difference between the two assays for determination of growth factor content of several samples.

Features:

- **Gain Sensitivity:** Detect as few as 1,000 cells/well with a 96-well plate reader. Greater sensitivity than the neutral red assay procedure.
- **Use a Variety of Cells:** Assay mammalian, plant and yeast cells.
- **Non-Radioactive:** Requires no scintillation cocktail or radioactive waste disposal.
- **Save Time:** Perform the assay in a 96-well plate with no washing steps, no cell harvesting and no scintillation counting.
- **Adapt to Your Needs:** Follow either a 4-hour or overnight protocol.
- **Convenient:** Requires no weighing or mixing of dye components.

Storage Conditions: Store Dye Solution at –20°C and Solubilization/Stop Solution at room temperature.

Available in the Helix® on-site stocking system

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CellTiter-Blue® Cell Viability Assay

Product	Size	Cat.#
CellTiter-Blue® Cell Viability Assay	20 ml	G8080
	100 ml	G8081
	10 × 100 ml	G8082

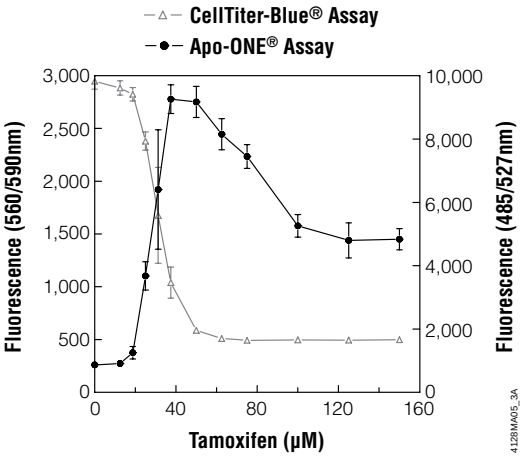
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTiter-Blue® Cell Viability Assay provides a homogeneous, fluorescent method for monitoring cell viability. The assay is based on the ability of living cells to convert a redox dye (resazurin) into a fluorescent end product (resorufin). Nonviable cells rapidly lose metabolic capacity and thus do not generate a fluorescent signal. The homogeneous assay procedure involves adding the single reagent directly to cells cultured in serum-supplemented medium. After an incubation step, data are recorded using either a plate-reading fluorometer (preferred) or spectrophotometer.

Features:

- **Save Time:** The homogeneous, add-incubate-measure format reduces the number of handling steps.
- **Perform More Than One Assay on the Same Sample:** The system can be multiplexed with other assay methods such as the Apo-ONE® Homogeneous Caspase-3/7 Assay (Cat.# G7790) or the Caspase-Glo® Assays (Cat.# G8090, G8200, G8210) for detecting apoptosis.
- **Gain Flexibility:** The CellTiter-Blue® Assay has an excellent Z′ factor and offers more flexibility in assay incubation times compared to other resazurin-based assays.
- **Safe:** The reagent is generally nontoxic to cells, allowing extended incubation periods in some situations. Requires no scintillation cocktail, radioactive waste disposal (unlike [^{3}H]-thymidine incorporation assays) or hazardous solvents (as required for MTT tetrazolium-based assays).
- **Adapt to Your Throughput Needs:** The reagent is designed to provide sufficient volumes for accurate pipetting into 96- or 384-well formats. Convenient product sizes available for high-throughput screening.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store frozen at –20°C protected from light.



Multiplexing cell-based assays. Collecting viability data (CellTiter-Blue® Assay) and apoptosis data (Apo-ONE® Caspase-3/7 Assay) from the same wells.

Viral ToxGlo™ Assay

Product	Size	Cat.#
Viral ToxGlo™ Assay	10 ml	G8941
	10 × 10 ml	G8942
	100 ml	G8943

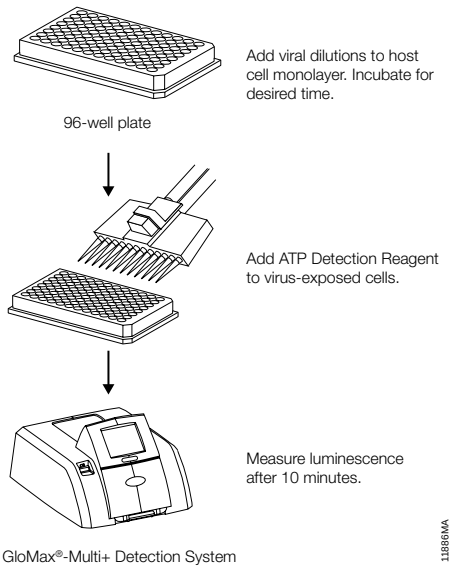
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Viral ToxGlo™ Assay is a simple, quantifiable method of determining viral-induced cytopathic effects (CPE) in host cells caused by lytic virions. The assay measures cellular ATP as a surrogate measure of host cell viability. When CPE occurs due to viral infection, ATP depletion can be measured and correlated with viral burden. The amount of ATP detected is directly proportional to the number of viable host cells in culture and can be used as a simple method to quantify viral-induced CPE. The homogeneous "add-mix-measure" assay procedure involves adding the single reagent (ATP Detection Reagent) directly to host cells following viral treatment. A "glow-type" luminescent signal is generated that is proportional to the amount of ATP present. Cell washing, multiple pipetting steps and visual assessment are not required to assess CPE. The system detects as few as 15 cells/well in a 384-well format in 10 minutes after reagent addition and mixing and is designed for use in multiwell formats, making it ideal for automated high-throughput screening (HTS).

Features:

- **Objectively Quantify CPE:** The assay provides quantifiable data by luminescence detection, which obviates subjective operator error associated with visual scoring methods.
- **Decrease Time to Results:** Record data and begin analysis as soon as 10 minutes after reagent addition.
- **Simplify Assessment of CPE:** The "add-mix-measure" protocol dramatically reduces the manual steps required for CPE assessment.
- **Choose Your Format:** The reagent is scalable from 96- to 1536-well plate formats.
- **Amenable to High Throughput Screening:** Luminescent signal is very stable with a half-life generally >5 hours dependent on cell type and medium used, allowing batch or consecutive processing. No fluorescence interference results in high signal to background and delivers excellent Z′ values in screening applications.
- **Choose Your Reagent Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized ATP Detection Substrate and ATP Detection Buffer should be stored at –30°C to –10°C.



The ATP Detection Reagent is added directly to virus-exposed cells cultured in serum-supplemented medium. Cell washing, multiple pipetting steps and visual analysis are not required for assessment of CPE.

ADCC Reporter Bioassay, Complete Kit (Raji)

Product	Size	Cat.#
ADCC Reporter Bioassay, Complete (Raji)	1 each	G7015
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 32.

ADCC Bioassay Effector Cells, Propagation Model

Product	Size	Cat.#
ADCC Bioassay Effector Cells, Propagation Model	1 each	G7102
Not For Medical Diagnostic Use.		

For additional information see page 35.

Cytotoxicity Assays

MultiTox-Glo Multiplex Cytotoxicity Assay

Product	Size	Cat.#
MultiTox-Glo Multiplex Cytotoxicity Assay	10 ml	G9270
	5 × 10 ml	G9271
	2 × 50 ml	G9272
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The MultiTox-Glo Multiplex Cytotoxicity Assay is a sequential-reagent-addition fluorescent and luminescent assay that measures the relative number of live and dead cells in cell populations. The MultiTox-Glo Assay sequentially measures two protease activities; one is a marker of viability, and the other is a marker of cytotoxicity. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (GF-AFC). This substrate enters intact cells, where it is cleaved by the live cell protease activity to release AFC and generate a fluorescent signal that is proportional to the number of viable cells. The live-cell protease becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, luminogenic cell-impermeant peptide substrate (AAF-aminoluciferin) is used to measure dead-cell protease activity, which is released from cells that have lost membrane integrity. The liberated aminoluciferin product is measured as "glow type" luminescence generated by Ultra-Glo™ Recombinant Luciferase provided in the assay reagent.

The MultiTox-Glo Assay gives ratiometric, inversely correlated measures of cell viability and cytotoxicity, which correlate with established methods for measuring viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. Having complementary cell viability and cytotoxicity measures reduces errors associated with pipetting and cell clumping, as well as serving as an internal control to allow identification of errors resulting from chemical interference from test compounds or media components.

Features:

- **Measure the Number of Live Cells and Dead Cells in Culture:** Sequential-reagent-addition assay with a homogeneous "add-mix-measure" protocol.
- **Normalize Data with a Built-In Internal Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and can be used to normalize data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Immediately Identify More False-Positives and False-Negatives:** Independent cell viability and cytotoxicity measurements serve as controls for each other. If test compounds interfere with one assay chemistry, the other serves as an internal control.
- **Improve your Data:** Reduce statistical probability of false-positives (or false-negatives), and eliminate fluorescence interference issues by luminescence readout.

Storage Conditions: Store at –20°C, protected from light.

Available in the Helix® on-site stocking system

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MultiTox-Fluor Multiplex Cytotoxicity Assay

Product	Size	Cat.#
MultiTox-Fluor Multiplex Cytotoxicity Assay	10 ml	G9200
	5 × 10 ml	G9201
	2 × 50 ml	G9202

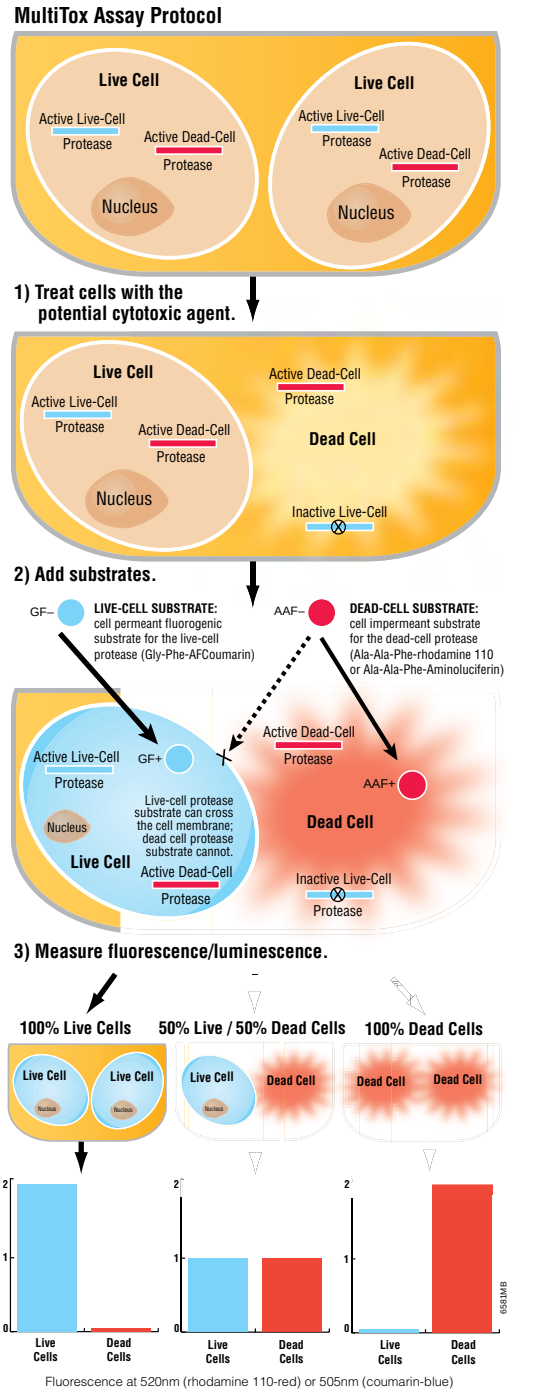
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MultiTox-Fluor Multiplex Cytotoxicity Assay is a single-reagent-addition, homogeneous, fluorescent assay that measures the number of live and dead cells simultaneously in culture wells. The assay simultaneously measures cell viability and cytotoxicity by detecting two distinct protease activities. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (GF-AFC Substrate). The substrate enters intact cells where it is cleaved to generate a fluorescent signal proportional to the number of living cells. This live-cell protease activity marker becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, cell-impermeant, fluorogenic peptide substrate (bis-AAF-R110 Substrate) is used to measure dead-cell protease activity that has been released from cells that have lost membrane integrity.

Features:

- **Measure the Number of Live and Dead Cells in Culture:** Homogeneous, "add-mix-measure" protocol eliminates parallel plate processing and reduces cell culture costs.
- **Normalize Data for Cell Number:** The ratio of live:dead cells is independent of cell number and normalizes data. Data normalization for cell number makes results more comparable well-to-well, plate-to-plate, day-to-day.
- **Reduce False-Positive and -Negative Results:** Complementary live- and dead-cell measures with independent chemistries serve as internal controls for each other.
- **Get More Data from Every Well:** Multiplex the MultiTox-Fluor Assay with most Promega bioluminescent cell-based apoptosis or genetic reporter assays.
- **Reduce Assay Variability:** The homogeneous "add-mix-measure" protocol avoids the cumulative error associated with multistep protocols.

Storage Conditions: Store at –20°C.



Overview of the MultiTox-Fluor Multiplex Cytotoxicity Assay protocol.

ApoTox-Glo™ Triplex Assay

Product	Size	Cat.#
ApoTox-Glo™ Triplex Assay	10 ml	G6320
	5 × 10 ml	G6321

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ApoTox-Glo™ Triplex Assay combines three assay chemistries to easily assess viability, cytotoxicity and apoptosis events in the same cell-based assay well. First, viability and cytotoxicity are determined by measuring two differential protease biomarkers simultaneously with the addition of a single nonlytic reagent containing two peptide substrates. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (GF-AFC Substrate). The substrate enters intact cells, where it is cleaved to generate a fluorescent signal proportional to the number of living cells. This live-cell protease activity marker becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, cell-impermeant, fluorogenic peptide substrate (bis-AAF-R110 Substrate) is used simultaneously to measure dead-cell protease activity that has been released from cells that have lost membrane integrity. This results in ratiometric, inversely correlated measures of cell viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. A second reagent containing luminogenic DEVD-peptide substrate for caspase-3/7 and Ultra-Glo™ Recombinant Thermostable Luciferase is added. Caspase-3/7 cleavage of the substrate releases luciferin, which is a substrate for luciferase and generates light. The light output, measured with a luminometer, correlates with caspase-3/7 activation as a key indicator of apoptosis.

Features:

- **Measure Viability, Cytotoxicity and Apoptosis in the Same Sample Well:** Determine mechanism of cell death for cells in the same sample well.
- **Easily Implement:** Assay follows a simple sequential "add-mix-measure" format.
- **Normalize Data with a Built-In Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and normalizes data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Flexible and Easily Automated:** The volumes of each assay component can be scaled to meet throughput needs and is amenable to automation in 96- and 384-well plates.
- **Improves Efficiency and Saves on Lab Budget:** Reduces cell culture and labor costs by performing three assays in a single well.

Storage Conditions: Store all components at –20°C protected from light.

CellTox™ Green Cytotoxicity Assay

Product	Size	Cat.#
CellTox™ Green Cytotoxicity Assay	10 ml	G8741
	50 ml	G8742
	100 ml	G8743
CellTox™ Green Express Cytotoxicity Assay	200 µl	G8731

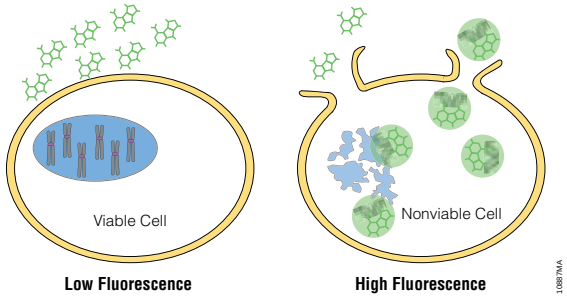
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CellTox™ Green Cytotoxicity Assay measures changes in membrane integrity that occur as a result of cell death. The assay is intended to assess cytotoxicity in cell culture after experimental manipulation. The assay system uses a proprietry asymmetric cyanine dye that is excluded from viable cells but preferentially stains the DNA from dead cells. When the dye binds DNA released from cells, its fluorescence properties are substantially enhanced. Viable cells produce no appreciable increases in fluorescence. Therefore, the fluorescence signal produced by the binding interaction with dead cell DNA is proportional to cytotoxicity. The CellTox™ Green Dye is nontoxic to cells, and the signal remains constant after exposure of 72 hours, making it ideal for determining toxic effects of treatments throughout an extended exposure or as an endpoint determination.

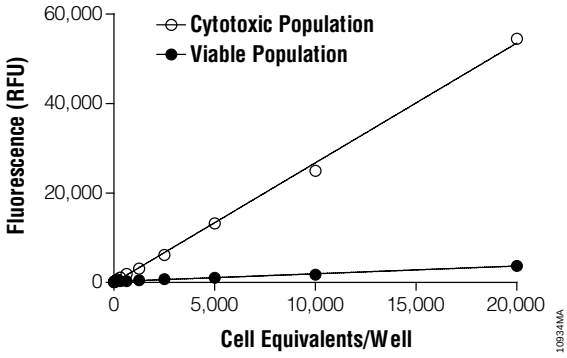
Features:

- **Accurate Cytotoxicity Determination:** The CellTox™ Green Dye stably binds DNA of cells that have lost membrane integrity throughout 72-hour exposure and won't underestimate cytotoxicity.
- **Kinetic Cytotoxicity Measures:** Measure cytotoxicity at convenient time points from the same sample well to detect onset of toxicity with no duplication of plates.
- **Simple and Flexible Protocols:** Add assay reagent directly to cells prior to plating or with dosing media to perform kinetic cytotoxicity measurements, eliminating a reagent dispensing step, or add diluted dye directly to cell culture wells as an endpoint add-mix-measure assay.
- **Multiplexing-Compatible:** Get more informative data per well and reduce cell culture expenses by multiplexing with fluorescent and luminescent cell-based assays in the same well with no sample manipulation.
- **Easily Automated:** Easily scale from 96- to 1536-well plate formats with "no-addition" or "single-addition" protocols.

Storage Conditions: Store at –20°C.



CellTox™ Green Dye binds DNA of cells with impaired membrane integrity.



CellTox™ Green Dye fluorescence is proportional to dead-cell number.

Lysis Solution

Product	Size	Cat.#
Lysis Solution	5 ml	G1821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Lysis Solution is a detergent solution useful for lysing cells and creating a cytotoxicity positive control.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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CytoTox-Glo™ Cytotoxicity Assay

Product	Size	Cat.#
CytoTox-Glo™ Cytotoxicity Assay	10 ml	G9290
	5 × 10 ml	G9291
	2 × 50 ml	G9292

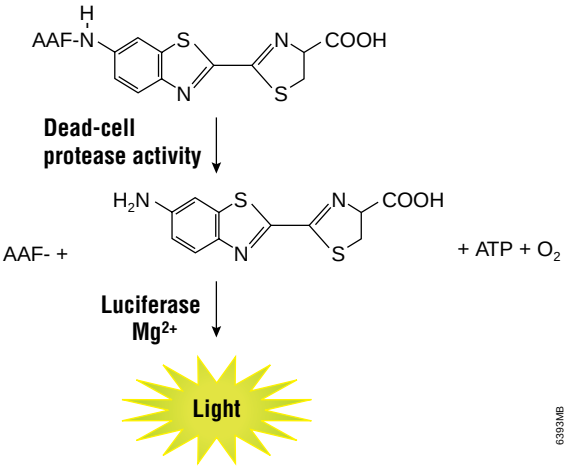
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CytoTox-Glo™ Assay is a luminescent cytotoxicity assay that measures the relative number of dead cells in cell populations. The CytoTox-Glo™ Assay measures the extracellular activity of a distinct intracellular protease activity (dead-cell protease) when the protease is released from membrane-compromised cells. A luminogenic cell-impermeant peptide substrate (AAF-aminoluciferin) is used to measure dead-cell protease activity. The liberated aminoluciferin product is measured as "glow type" luminescence generated by Ultra-Glo™ Recombinant Luciferase provided in the assay reagent. The AAF-aminoluciferin substrate cannot cross the intact membrane of viable cells and does not generate any appreciable signal from the live-cell population. The amount of luminescence directly correlates with the percentage of cells undergoing cytotoxic stress. With the addition of a lysis reagent (provided), the CytoTox-Glo™ Assay also can deliver the luminescent signal associated with the total number of cells in each assay well. Viability can be calculated by subtracting the luminescent dead-cell signal from the total luminescent value, thus allowing you to normalize assay data to cell number and mitigate assay interferences that may lead to erroneous conclusions. The cytotoxicity protease biomarker is constitutive and conserved across cell lines, and the CytoTox-Glo™ Assay demonstrates excellent correlation with other methods of assessing cell viability.

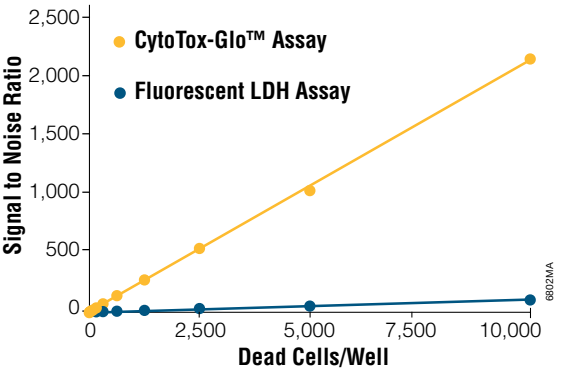
Features:

- **Measure the Relative Number of Dead Cells in Culture:** Measure cytotoxicity by adding a single reagent with the homogeneous "add-mix-measure" protocol.
- **Distinguish Between Small Differences in Viability:** The assay provides a linear response and can distinguish between small differences in viability across the entire spectrum of cytotoxicity, from modest cytotoxicity (100 to 95% viability) to profound cytotoxicity (5 to 0% viability).
- **Normalize Data for Cytotoxicity:** Data normalization for dead-cell number makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Measure the Relative Number of Remaining Viable Cells Using a Total Lysis Protocol:** Correlate increased cytotoxicity with a reduction in viable cells.
- **Improve your Data:** Reduce statistical probability of false-positives (or false-negatives), and eliminate fluorescence interference issues with a stable luminescence readout.

Storage Conditions: Store at –20°C, protected from light.



Cleavage of the luminogenic AAF-Glo™ Substrate by dead-cell protease activity.



Superior sensitivity and dynamic range of the CytoTox-Glo™ Assay compared to fluorescent LDH Assay.

CytoTox-Fluor™ Cytotoxicity Assay

Product	Size	Cat.#
CytoTox-Fluor™ Cytotoxicity Assay	10 ml	G9260
	5 × 10 ml	G9261
	2 × 50 ml	G9262

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CytoTox-Fluor™ Cytotoxicity Assay is a single-reagent-addition, homogeneous, fluorescent assay that measures the relative number of dead cells in cell populations. The assay measures a distinct protease activity associated with cytotoxicity and uses a fluorogenic peptide substrate (bis-alanyl-alanyl-phenylanlanyl-rhodamine 110; bis-AAF-R110) to measure "dead-cell activity," which has been released from cells that have lost membrane integrity. The bis-AAF-R110 substrate cannot cross the intact membrane of live cells and therefore gives no signal from live cells. The assay is designed to accommodate downstream multiplexing with several Promega luminescent assays or spectrally distinct fluorescent assay methods, such as assays to measure caspase activation, reporter gene expression or orthogonal measures of viability.

Features:

- **Measure the Relative Number of Dead Cells in Culture:** Homogeneous, "add-mix-measure" protocol eliminates parallel plate processing and reduces cell culture costs.
- **Get More Data from Every Well:** Multiplex the CytoTox-Fluor™ Assay with several Promega luminescent cell-based assays.
- **Normalize Downstream Multiplex Data for Cytotoxicity:** Data normalization for dead-cell number makes results more comparable well-to-well, plate-to-plate, day-to-day.
- **Reduce Assay Variability:** The homogeneous "add-mix-measure" protocol avoids the cumulative error associated with multistep protocols.

Storage Conditions: Store at –20°C.

CytoTox-ONE™ Homogeneous Membrane Integrity Assay

Product	Size	Cat.#
CytoTox-ONE™ Homogeneous Membrane Integrity Assay	200–800 assays	G7890
	1,000–4,000 assays	G7891
CytoTox-ONE™ Homogeneous Membrane Integrity Assay, HTP	1,000–4,000 assays	G7892

For Research Use Only. Not for Use in Diagnostic Procedures.

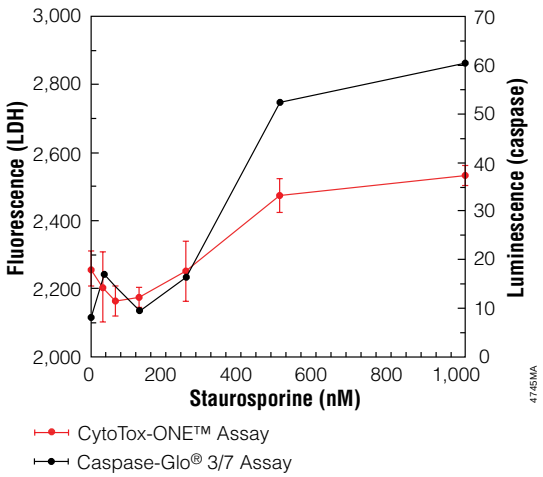
Description: The CytoTox-ONE™ Homogeneous Membrane Integrity Assay is a fluorometric method for estimating the number of nonviable cells present in multiwell plates. The CytoTox-ONE™ Assay rapidly measures the release of lactate dehydrogenase (LDH) from cells with a damaged membrane. LDH released into the culture medium is measured with a 10-minute coupled enzymatic assay that results in the conversion of resazurin into a fluorescent resorufin product. The amount of fluorescence produced is proportional to the number of lysed cells using a 96- or 384-well format. The CytoTox-ONE™ Reagent does not damage normal healthy cells; therefore the reactions to measure released LDH can be performed directly in a homogeneous format in assay wells containing a mixed population of viable and damaged cells.

The CytoTox-ONE™ Homogeneous Membrane Integrity Assay, HTP (Cat.# G7892), offers convenient, alternative packaging for processing multiple plates. Each bottle of reagent supplied with the system is sufficient to perform 500 assays in a 96-well format or 2,000 assays in a 384-well format when the recommended volumes are used.

Features:

- **Save Time:** Complete the assay in the cell culture plate, eliminating the sample transfer step common in many LDH assays; the plates are incubated for 10 minutes before reading data, compared to 30 minutes or more with classic LDH assays.
- **Multiplex This Assay:** Perform multiple assays on one sample with other homogeneous cell-based assays from Promega.
- **Adapt Protocol to Your Needs:** Completed assays can be read over several hours after the provided stop solution has been added while still maintaining good signal.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C protected from light.



Multiplexing the CytoTox-ONE™ Assay and the Caspase-Glo® 3/7 Assay. With most in vitro apoptosis assays, LDH release occurs relatively late during the process. The duration of drug exposure here was carefully chosen to demonstrate the early stages of cell lysis, while still retaining caspase activity.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

CytoTox 96® Non-Radioactive Cytotoxicity Assay

Product	Size	Cat.#
CytoTox 96® Non-Radioactive Cytotoxicity Assay	1,000 assays	G1780

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The CytoTox 96® Non-Radioactive Cytotoxicity Assay is a colorimetric alternative to radioactive cytotoxicity assays. The CytoTox 96® Assay quantitatively measures lactate dehydrogenase (LDH), a stable cytosolic enzyme that is released upon cell lysis, in much the same way as [^{51}Cr] is released in radioactive assays. Released LDH in culture supernatants is measured with a 30-minute coupled enzymatic assay that results in the conversion of a tetrazolium salt (INT) into a red formazan product. The amount of color formed is proportional to the number of lysed cells. Visible wavelength absorbance data are collected using a standard 96-well plate reader. The assay can be used to measure membrane integrity for cell-mediated cytotoxicity assays in which a target cell is lysed by an effector cell, or to measure lysis of target cells by bacteria, viruses, proteins, chemicals, etc.

Features:

- **Non-Radioactive:** Requires no radioactive waste disposal or [^{51}Cr].
- **Save Time:** Eliminates labeling of target cells prior to experiment.
- **Use Standard Equipment:** Collect absorbance (visible wavelength) data with a standard 96-well plate reader.
- **Adapt to Your Needs:** Used for a variety of applications including measurement of: 1) cell-mediated cytotoxicity; 2) chemical-mediated cytotoxicity; and 3) total cell number.
- **Gain Sensitivity:** Can reveal early, low-level damage to cell membranes that is often missed with other methodologies.

Storage Conditions: Store Substrate Mix and Assay Buffer at –20°C. Store LDH Positive Control, Lysis Solution (10X) and Stop Solution at 4°C.

Griess Reagent System

Product	Size	Cat.#
Griess Reagent System	1,000 assays	G2930

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Griess Reagent System measures nitrite (NO_2^-), which is one of two primary stable and nonvolatile breakdown products of nitric oxide (NO). Nitric oxide is an important physiological messenger and effector molecule in many biological systems, including immunological, neuronal and cardiovascular tissues. This assay relies on a diazotization reaction that was originally described by Griess in 1879. Through the years, many modifications to the original reaction have been described.

The Griess Reagent System is based on a chemical reaction that uses sulfanilamide and N-1-naphthylethylenediamine dihydrochloride (NED) under acidic (phosphoric acid) conditions. This system detects NO_2^- in a variety of biological and experimental liquid matrices such as plasma, serum, urine and tissue culture medium. The nitrite sensitivity is dependent on the matrix. The limit of detection is 2.5µM (125pmol) nitrite (in ultrapure, deionized, distilled water) using the protocol described in Technical Bulletin #TB229.

Storage Conditions: Store at 4°C. Keep all solutions in their original light-protective plastic bottles.

Toxicity Pathway Analysis

GloResponse™ Luciferase Reporter Cell Lines

Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line	2 vials	E8530

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloResponse™ Luciferase Reporter Cell Lines contain optimized, state-of-the-art luciferase reporter technology integrated into a cell line. This allows the rapid development of a reporter assay based on the pathway of interest regulating the luciferase gene. Assays configured using the GloResponse™ Cell Lines are amenable for high-throughput screening. These assays typically have greater response dynamics (fold of induction) than other assay formats, and they exhibit good quality as indicated by the high Z′ values. GloResponse™ Cell Lines were developed to study a variety of signaling pathways. Activators of these pathways may be native to the HEK293 cell line. Activity of non-native activators can be studied after they have been introduced by transfection.

GPCRs regulate a wide-range of biological functions and are one of the most important target classes for drug discovery. GPCR signaling pathways can be categorized into three classes based on the G protein α-subunit involved: Gs, Gi/o and Gq. The GloResponse™ CRE-*luc2P* HEK293 Cell Line can be used to study and configure screening assays for Gs- and Gi/o-coupled GPCRs, which signal through cAMP and the cAMP Response Element (CRE). For Gq-coupled GPCRs, which signal through calcium ion release and activate the Nuclear Factor of Activated T-Cells response element (NFAT-RE), the GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line should be used.

NF-κB-REs are the DNA binding sequences for the NF-κB transcription factor complex, which is responsible for regulating inflammation, immune response, cell growth and apoptosis. The GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line is designed for rapid and convenient analysis of any cellular response that results in modulation of NF-κB activities.

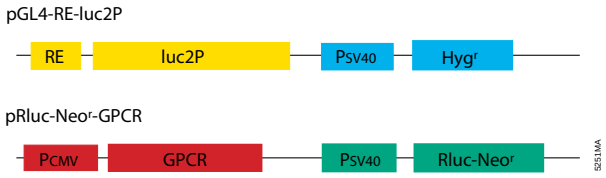
The GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line contains nine repeats of GAL4 UAS (Upstream Activator Sequence) driving the transcription of the luciferase reporter gene *luc2P* in response to binding of a fusion protein containing the GAL4 DNA Binding Domain, such as the Estrogen Receptor Ligand Binding Domain in pBIND-ERα Vector (Cat.# E1390) when activated by a ligand. This makes the cell line suitable for the study of nuclear receptors or can be used to study other types of protein:protein and protein:DNA interactions. The GAL4 DNA Binding Domain partner must be introduced to this cell line by transfection or other similar techniques.

The GloResponse™ Cell Lines were generated by clonal selection of HEK293 cells stably transfected with pGL4-based vectors carrying specific response elements for the pathway of interest. These cell lines incorporate the improvements developed for the pGL4 family of reporter vectors for enhanced performance. The destabilized *luc2P* luciferase reporter is used for improved responsiveness to transcriptional dynamics. The *luc2P* gene is codon optimized for enhanced expression in mammalian cells, and the pGL4 plasmid backbone was engineered to reduce background reporter expression. The result is a cell line with very high induction levels when the pathway of interest is activated.

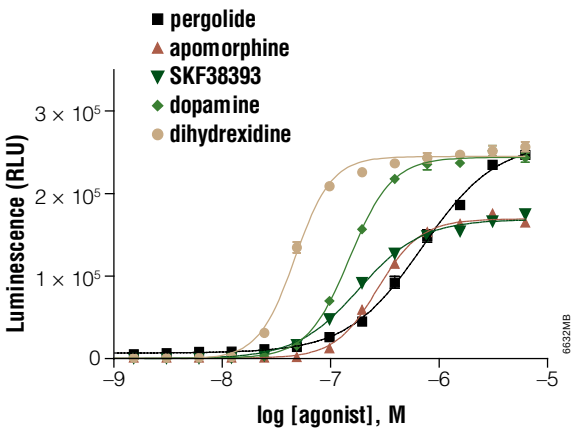
Features:

- **Convenient:** Prebuilt, optimized luciferase reporter cell lines.
- **Robust:** Large assay window provided by high levels of induction and low background expression.
- **Faster Results:** Improved responsiveness to transcriptional dynamics with destabilized luciferase.

Storage Conditions: Place frozen cells in storage at less than or equal to –140°C (mechanical deep freeze or vapor phase liquid nitrogen) until you are ready to thaw and propagate them. We strongly recommend that the cells are propagated, using the provided procedure, as soon as possible. This will ensure the optimal cell viability and assay performance.



Two plasmids involved in the dual-luciferase GPCR assay. RE, response element/promoter; *luc2P*, destabilized firefly luciferase with PEST sequence; P_{SV40}, SV40 promoter; Hyg^r, hygromycin resistance gene; P_{CMV}, CMV promoter; *Rluc*-neo^r, *Renilla* luciferase and neomycin resistance gene fusion. PEST sequences are associated with rapidly degraded proteins.



Ranking compound potency and detection of DRD1 partial agonists. A GloResponse™ CRE-*luc2P* clone stably expressing dopamine receptor D1 was plated at 10,000 cells/well in a 96-well plate. Each agonist was serially diluted 1:2, then added to wells in replicates of four, beginning with 50µM. Cells were incubated with agonist for four hours, harvested and analyzed using the Dual-Glo™ Luciferase Assay System (Cat.# E2920). Luciferase activity was measured on the GloMax® 96 Microplate Luminometer (Cat.# E6501).

Available in the Helix® on-site stocking system
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Signaling Pathway Analysis (Minimal Promoter-Driven) Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.37[*luc2P*/ARE/Hygro] Vector	20 µg	E3641
pGL4.38[*luc2P*/p53 RE/Hygro] Vector	20 µg	E3651
pGL4.39[*luc2P*/ATF6 RE/Hygro] Vector	20 µg	E3661
pGL4.40[*luc2P*/MRE/Hygro] Vector	20 µg	E4131
pGL4.41[*luc2P*/HSE/Hygro] Vector	20 µg	E3751
pGL4.42[*luc2P*/HRE/Hygro] Vector	20 µg	E4001
pGL4.43[*luc2P*/XRE/Hygro] Vector	20 µg	E4121
pGL4.44[*luc2P*/AP1 RE/Hygro] Vector	20 µg	E4111
pGL4.45[*luc2P*/ISRE/Hygro] Vector	20 µg	E4141
pGL4.47[*luc2P*/SIE/Hygro] Vector	20 µg	E4041
pGL4.48[*luc2P*/SBE/Hygro] Vector	20 µg	E3671
pGL4.49[*luc2P*/TCF-LEF RE/Hygro] Vector	20 µg	E4611
pGL4.52[*luc2P*/STAT5RE/Hygro] Vector	20 µg	E4651
pGL4.29[*luc2P*/CRE/Hygro] Vector	20 µg	E8471
pGL4.30[*luc2P*/NFAT-RE/Hygro] Vector	20 µg	E8481
pGL4.32[*luc2P*/NF-κB-RE/Hygro] Vector	20 µg	E8491
pGL4.33[*luc2P*/SRE/Hygro] Vector	20 µg	E1340
pGL4.34[*luc2P*/SRF-RE/Hygro] Vector	20 µg	E1350
Available Separately	**Size**	**Cat.#**
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.25[*luc2CP*/minP] Vector	20 µg	E8431
pGL4.26[*luc2*/minP/Hygro] Vector	20 µg	E8441
pGL4.27[*luc2P*/minP/Hygro] Vector	20 µg	E8451
pGL4.28[*luc2CP*/minP/Hygro] Vector	20 µg	E8461
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: See All pGL4 Vectors

Creating a cell line with an indicator of a functional signaling pathway is useful for deciphering the components in a signaling pathway. These tools are made by insertion of multiple repeats of a response element upstream of a minimal promoter (minP). Promega has designed vectors that report the activity of a variety of pathways using the optimized *luc2* firefly luciferase gene in the pGL4 backbone. These vectors also have a hygromycin resistance selectable marker, allowing use either in transient transfection experiments or for selection of a stable cell line.

Available vectors and the pathways each can measure.

Also available for construction of pathway reporters are minimal promoter (minP) vectors with three varieties of engineered firefly luciferase genes: *luc2, luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the luc2 gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The minP vectors are available with or without selectable markers (hygromycin). To speed research, several predesigned response element vectors are available already assembled in the pGL4.27 Vector. Some of these also are available stable cell lines (GloResponse™ Cell Lines).

Features:

- **Predesigned vectors remove the need to clone and validate an assay.**
- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology using destabilized luciferase genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.

Storage Conditions: Store at –20°C.

Oxidative Stress Assays

ROS H_2O_2 Assay

Product	Size	Cat.#
ROS-Glo™ H_2O_2 Assay	10 ml	G8820
	50 ml	G8821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ROS-Glo™ H_2O_2 Assay is a homogeneous, fast and sensitive bioluminescent assay that measures the level of hydrogen peroxide (H_2O_2), a reactive oxygen species (ROS), directly in cell culture or in defined enzyme reactions. A derivatized luciferin substrate is incubated with sample and reacts directly with H_2O_2 to generate a luciferin precursor. Addition of ROS-Glo™ Detection Solution converts the precursor to luciferin and provides Ultra-Glo™ Recombinant Luciferase to produce light signal that is proportional to the level of H_2O_2 present in the sample.

Features:

- **Direct Cell-Based Detection:** The assay can be performed in various cell culture media with or without serum, eliminating the need to remove the media from cultured cells before performing the assay.
- **Simple and Fast Assay:** The homogeneous assay uses a simple two-reagent-addition protocol that does not require sample manipulation. The assay can be completed in less than 2 hours after adding reagent.
- **Non-HRP-Based Detection:** The ROS-Glo™ H_2O_2 Substrate reacts directly with H_2O_2, obviating the need for horseradish peroxidase (HRP) as a coupling enzyme and thus eliminating false hits associated with HRP inhibition.
- **Automation-Compatible Format:** Easily scale from 96- to 384-well plate formats.
- **Flexible Assay:** The assay can be used to screen compounds in both cell-based and enzyme-based formats.
- **Multiplex-Compatible System:** Get more informative data per well and reduce cell culture expenses by multiplexing with this assay a real-time cytotoxicity assay (CellTox™ Green Cytotoxicity Assay) in the same well or with a viability assay.

Storage Conditions: Store all components at –30°C to –10°C.

GSH/GSSG-Glo™ Assay

Product	Size	Cat.#
GSH/GSSG-Glo™ Assay	10 ml	V6611
	50 ml	V6612

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GSH/GSSG-Glo™ Assay is a luminescence-based system for the detection and quantification of total glutathione (GSH +GSSG), GSSG and GSH/GSSG ratios in cultured cells. A change in GSH levels is important in the assessment of toxicological responses and is an indicator of oxidative stress, potentially leading to apoptosis or cell death. The assay provides a simple, rapid multiwell-plate format where stable luminescent signals are correlated with either the total GSH or the GSSG concentration of a sample directly in culture wells. Both total glutathione and GSSG determinations are based on the reaction where GSH-dependent conversion of a GSH probe, Luciferin-NT, to luciferin by a glutathione-S-transferase enzyme is coupled to a firefly luciferase reaction. Light from luciferase is dependent on the amount of luciferin formed, which is in turn dependent on the amount of GSH present. This makes the luminescent signal proportional to the amount of GSH. Determination of total glutathione and GSSG are performed in parallel reactions. In one configuration the assay reagents measure total glutathione using a reducing agent that converts all the glutathione, GSH and GSSG in a cell lysate to the reduced form, GSH. In a second configuration the assay reagents are used to measure only the oxidized form, GSSG. In this case, a reagent is added that blocks all the GSH while leaving the GSSG intact. This blocking step is followed by a reducing step that converts the GSSG to GSH for quantification in the luminescent reaction. Because the assays are performed directly on cells in culture wells, loss of GSH or GSSG is minimized, reducing variability.

Features:

- **Physiologically Relevant GSH/GSSG Ratios:** Actual levels of total glutathione and GSSG are measured directly in cell-culture wells, minimizing the loss of GSH and GSSG, compared to conventional assays that require upfront sample preparation and indirect GSSG calculation.
- **More Robust Performance:** Bioluminescent technology and a simple protocol minimize sample handling, reducing variability.
- **Simplified Protocol:** Assay reagents are added directly to cells cultured in multiwell plates. The homogeneous add-mix-read format eliminates time-consuming sample deproteination and centrifugation steps required of conventional assays.
- **Greater Sensitivity:** Fewer cells are required in these assays than in conventional assays because of the enhanced sensitivity.
- **Faster Results:** The homogeneous add-mix-read protocol minimizes hands-on time, and the bioluminescence technology minimizes incubation time.
- **Adaptable to Automation:** The glow-type signal is stable, with a half-life greater than two hours, and the protocol is adaptable to automation in 96- and 384-well plates.
- **No Fluorescence Interference:** Using luminescence readout eliminates the fluorescent interference between reagents and test compounds sometimes seen in fluorescence assays. Such overlap can confound analysis and present misleading or irrelevant data.

Storage Conditions: Store at –20ºC protected from light.

GSH-Glo™ Glutathione Assay

Product	Size	Cat.#
GSH-Glo™ Glutathione Assay	10 ml	V6911
	50 ml	V6912

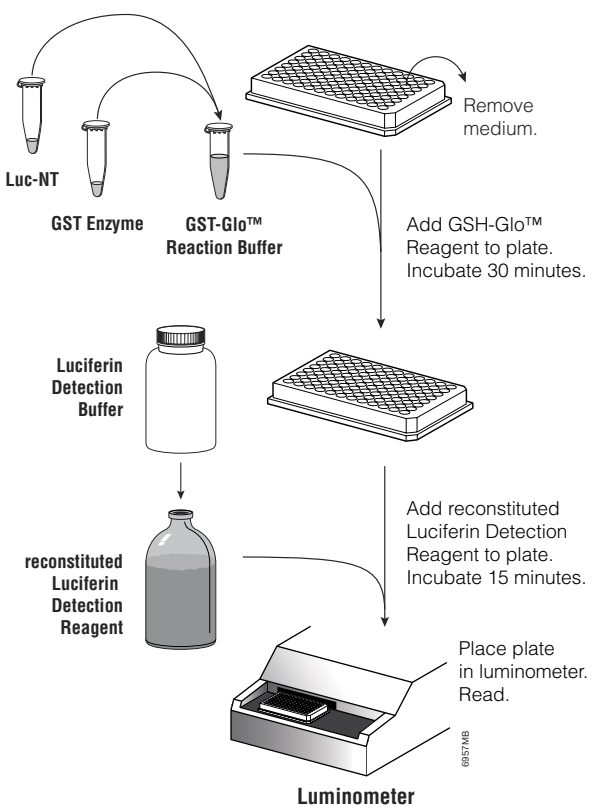
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GSH-Glo™ Assay is a luminescent-based assay for the detection and quantification of glutathione (GSH) in cells or in various biological samples. A change in GSH levels is important in assessment of toxicological responses and is an indicator of oxidative stress, potentially leading to apoptosis or cell death. The assay is based on the conversion of a luciferin derivative into luciferin in the presence of GSH. The reaction is catalyzed by a glutathione S-transferase (GST) enzyme supplied in the kit. The luciferin formed is detected in a coupled reaction using Ultra-Glo™ Recombinant Luciferase that generates a glow type luminescence that is proportional to the amount of glutathione present in cells. The assay provides a simple, fast and sensitive alternative to colorimetric and fluorescent methods and can be adapted easily to high-throughput applications.

Features:

- **Fast:** Results in as little as 30 minutes.
- **Simplified Method:** The simple two-reagent-addition assay minimizes the number of assay steps compared to conventional GSH assays and is adapted easily to higher throughput applications. No deproteination step required!
- **Greater Sensitivity:** The luminescent method avoids inherent background fluorescence associated with other methods thereby providing excellent signal-to-background ratios.
- **Stable Signal:** Half-life greater than 5 hours.

Storage Conditions: Store at –20°C protected from light.



Schematic showing GSH-Glo™ Assay procedure.

Available in the Helix® on-site stocking system

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Metabolism Assays

NAD(P)H-Glo™ Detection System

Product	Size	Cat.#
NAD(P)H-Glo™ Detection System	10 ml	G9061
	50 ml	G9062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The in vitro enzyme-based NAD(P)H-Glo™ Detection System is a homogeneous, bioluminescent assay that quantitatively monitors the concentration of the reduced forms of nicotimade adenine dinucleotides, NADH and NADPH, and does not discriminate between them. The oxidized forms, NAD^+ and $NADP^+$, are not detected and do not interfere with quantitation.

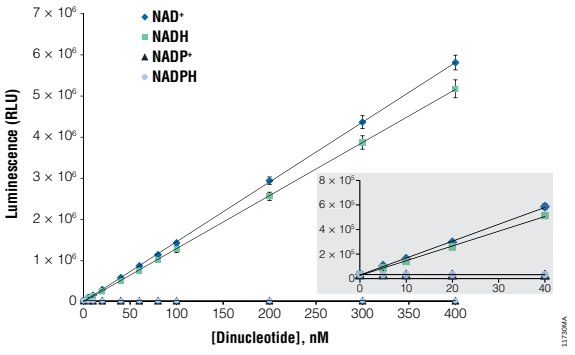
In the presence of NAD(P)H, a reductase enzyme reduces a proluciferin reductase substrate to form luciferin. Luciferin then is quantified using Ultra-Glo™ Recombinant Luciferase, and the light signal produced is proportional to the amount of NAD(P)H in the sample. The reductase and luciferase reactions are initiated by adding an equal volume of a single reagent, which contains reductase, proluciferin Reductase Substrate and Ultra-Glo™ Recombinant Luciferase, to a NAD(P)H-containing sample.

The assay is rapid, requiring only a 40- to 60-minute incubation, has a broad linear range and high signal-to background ratio. The assay is well suited to measuring NAD(P)H production or consumption in high-throughput formats.

Features:

- **Broad Linear Range:** The NAD(P)H-Glo™ Detection System detects 0.1µM to 25µM NAD(P)H.
- **High Sensitivity:** The limit of detection is ≤0.1µM NADH, with a maximum assay window (i.e., signal-to-background ratio) of 250. The system detects 1µM with a signal higher than fivefold over background.
- **Automation Compatible:** The add-and-read format is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1536-well plates.
- **Reliability and Reproducibility:** The NAD(P)H-Glo™ Detection System routinely yields Z´ factors >0.7.
- **Stable Signal:** The glow-type signal is stable, with a half-life greater than two hours, allowing batch plate processing.
- **Luminescence-Based NAD(P)H Detection:** The luminescent format avoids fluorescent interference due to reagents and test compounds sometimes seen in fluorescent assays.

Storage Conditions: Store all components at –20°C (–30°C to –10°C).



Linear range and specificity of the NAD Assays. NADH, NADPH, NAD^+ and $NADP^+$ stocks were prepared and diluted to the indicated concentrations in phosphate-buffered saline. Fifty-microliter samples at each dinucleotide concentration were incubated with 50µl of NAD/NADH-Glo™ Detection Reagent in white, 96-well luminometer plates. After a 30-minute incubation, luminescence was measured with a GloMax® 96 Microplate Luminometer. The limit of detection was approximately 1nM for this experiment.

NAD/NADH-Glo™ Assay

Product	Size	Cat.#
NAD/NADH-Glo™ Assay	10 ml	G9071
	50 ml	G9072

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The NAD/NADH-Glo™ Assay is a bioluminescent, homogeneous single-reagent-addition assay for detecting total oxidized and reduced nicotinamide adenine dinucleotides (NAD^+ and NADH, respectively) and determining their ratio in biological samples or in defined enzyme reactions. An NAD Cycling Enzyme is used to convert NAD^+ to NADH. In the presence of NADH, the provided reductase enzyme reduces a proluciferin reductase substrate to form luciferin. Luciferin then is quantified using Ultra-Glo™ Recombinant Luciferase, and the light signal produced is proportional to the amount of NAD^+ and NADH in the sample. Cycling between NAD^+ and NADH by the NAD Cycling Enzyme and Reductase increases assay sensitivity and provides selectivity for the nonphosphorylated NAD^+ and NADH compared to the phosphorylated forms $NADP^+$ and NADPH.

The NAD Cycling Enzyme, Reductase and luciferase reactions are initiated by adding an equal volume of NAD/NADH-Glo™ Detection Reagent, which contains NAD Cycling Enzyme and Substrate, Reductase, Reductase Substrate and Ultra-Glo™ Recombinant Luciferase, to an NAD^+- or NADH-containing sample. Detergent present in the reagent lyses cells, allowing detection of total cellular NAD^+ and NADH in a multiwell format with addition of a single reagent. An accessory protocol is provided to allow separate measurements of NAD^+ and NADH, and calculation of the NAD^+ to NADH ratio. The simple add-mix-read protocol and scalable assay chemistry make the NAD/NADH-Glo™ Assay well suited to monitor effects of small molecule compounds on NAD and NADH levels in high-throughput formats.

Features:

- **High Sensitivity:** High sensitivity of the assay enables detection of total NAD^+ and NADH directly in the wells. Fewer cells are required, with no sample preparation.
- **Homogeneous, One-Step Protocol:** Total NAD^+ and NADH is measured directly in wells of a 96- or 384-well cell culture plate with one reagent addition. A simple in-plate protocol is provided for individual NAD^+ and NADH measurements.
- **Large Assay Window:** The NAD/NADH-Glo™ Assay detects 10nM to 400nM NAD^+ or NADH. The assay detects 100nM with a signal higher than fivefold over background and an assay window (maximum signal-to-background ratio) of ≥100.
- **Automation Compatible:** The assay is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1536-well plates.
- **Reliability and Reproducibility:** The NAD/NADH-Glo™ Assay routinely yields Z´ factors >0.7.
- **Luminescence-Based NAD^+ and NADH Detection:** The luminescent format avoids fluorescent interference due to reagents and test compounds sometimes seen in fluorescent assays.

Storage Conditions: Store all components at –20°C (–30°C to –10°C).

NADP/NADPH-Glo™ Assay

Product	Size	Cat.#
NADP/NADPH-Glo™ Assay	10 ml	G9081
	50 ml	G9082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The NADP/NADPH-Glo™ Assay is a bioluminescent, homogeneous, single-reagent-addition method for rapid detection of total oxidized and reduced nicotinamide adenine dinucleotide phosphates ($NADP^+$ and NADPH, respectively) and for determination of their ratio in biological samples and defined enzyme reactions. An NADP cycling enzyme is used to convert $NADP^+$ to NADPH. In the presence of NADPH, a reductase enzyme reduces a proluciferin reductase substrate to form luciferin. Luciferin then is quantified using Ultra-Glo™ Recombinant Luciferase, and the light signal produced is proportional to the amount of $NADP^+$ and NADPH in the sample. Cycling between $NADP^+$ and NADPH by the NADP cycling enzyme and reductase increases assay sensitivity and provides selectivity for the phosphorylated $NADP^+$ and NADPH compared to the nonphosphorylated forms NAD^+ and NADH.

The NADP Cycling Enzyme, Reductase and luciferase reactions are initiated by adding an equal volume of NADP/NADPH-Glo™ Detection Reagent, which contains NADP cycling enzyme and substrate, reductase, proluciferin reductase substrate and Ultra-Glo™ Recombinant Luciferase, to an $NADP^+$- or NADPH-containing sample. Detergent present in the reagent lyses cells, allowing detection of total cellular $NADP^+$ and NADPH in a multiwell format with addition of a single reagent. The one-step protocol is useful for screening changes in total $NADP^+$ and NADPH levels. An accessory protocol is provided to allow separate measurements of $NADP^+$ and NADPH and calculation of the $NADP^+$ to NADPH ratio. The simple add-mix-read protocol and scalable assay chemistry make the NADP/NADPH-Glo™ Assay well suited to monitor effects of small-molecule compounds on NADP and NADPH levels in high-throughput formats.

Features:

- **High Sensitivity:** High sensitivity of the assay enables detection of total $NADP^+$ and NADPH directly in the wells. Fewer cells are required, with no sample preparation.
- **Homogeneous, One-Step Protocol:** Total $NADP^+$ and NADPH is measured directly in wells of a 96- or 384-well cell culture plate with one reagent addition. A simple in-plate protocol is provided for individual $NADP^+$ and NADPH measurements.
- **Large Assay Window:** The NADP/NADPH-Glo™ Assay detects 10nM to 400nM $NADP^+$ or NADPH. The assay detects 100nM with a signal higher than fivefold over background and an assay window (maximum signal-to-background ratio) of ≥100.
- **Automation Compatible:** The assay is compatible with automated and high-throughput protocols. Reactions are scalable and can be performed at low volumes in 96-, 384- and 1536-well plates.
- **Reliability and Reproducibility:** The NADP/NADPH-Glo™ Assay routinely yields Z´ factors >0.7.
- **Luminescence-Based $NADP^+$ and NADPH Detection:** The luminescent format avoids fluorescent interference due to reagents and test compounds sometimes seen in fluorescent assays.

Storage Conditions: Store all components at –20°C (–30°C to –10°C).

Mitochondrial Function Assays

Mitochondrial Toxicity Assay

Product	Size	Cat.#
Mitochondrial ToxGlo™ Assay	10 ml	G8000
	100 ml	G8001

For Research Use Only. Not for Use in Diagnostic Procedures.

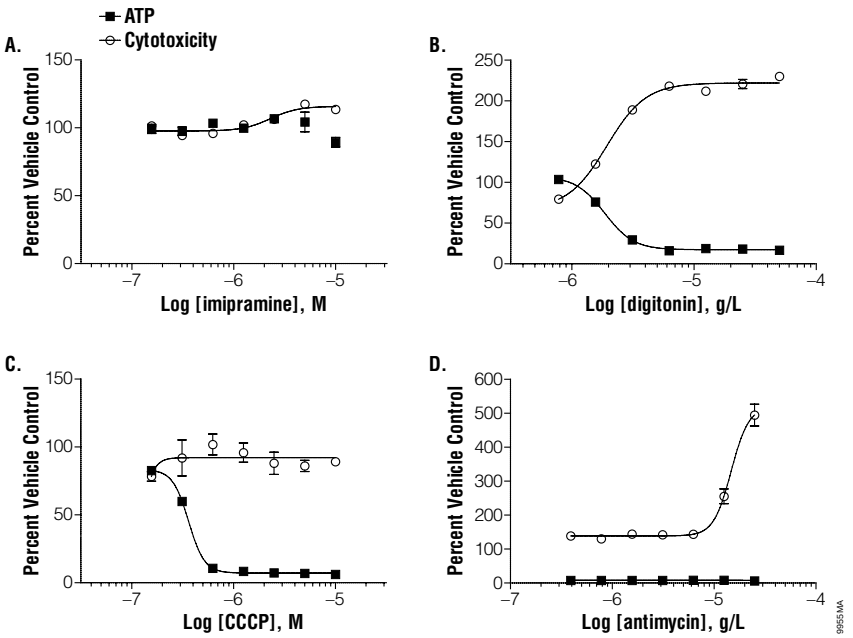
Description: The Mitochondrial ToxGlo™ Assay is a cell-based assay method that employs a sequential addition, multiplexed assay chemistry for predicting potential mitochondrial dysfunction as a result of xenobiotic exposure. The assay is based on the differential measurement of biomarkers associated with changes in cell membrane integrity and cellular ATP levels relative to vehicle-treated control cells during short exposure periods. Cell membrane integrity is first assessed by measuring the presence or abscence of a distinct protease activity associated with necrosis using a fluorogenic peptide substrate (bis-AAF-R110) to measure "dead cell protease activity". The bis-AAF-R110 Substrate cannot cross the intact membrane of live cells and therefore gives no signal with viable cells. Next, ATP is measured by adding an ATP detection reagent, resulting in cell lysis and generation of a luminescent signal proportional to the amount of ATP present. The two sets of data can be combined to produce profiles representative of mitochondrial dysfunction or non-mitochondrial related cytotoxic mechanisms.

Mammalian cells generate ATP by mitochondrial (oxidative phosphorylation) and non-mitochondrial (glycolysis) methods. To achieve optimal mitochondrial responsiveness, it may be necessary to refine cell culture conditions. Replacing glucose-supplemented medium with galactose-containing medium may increase cellular oxygen consumption and augment mitochondrial susceptibility to mitotoxicants.

Features:

- **Distinguish Primary Mitochondrial Dysfunction from Secondary Cytotoxic Events:** Cell-based, multiplexed method measures ATP (a proximal measure of mitochondrial function) in conjunction with a membrane integrity biomarker to distinguish primary mitochondrial dysfunction from secondary cytotoxic events directly in the same sample well.
- **Predictive for Mitochondrial Toxicities:** Produces profiles that are consistent with mitochondrial toxicity and discernible from other non-mitotoxic mechanisms of cell death.
- **Easy to Implement:** The assay uses a simple sequential "add-mix-read" format.
- **Fast:** Quickly assess potential mitochondrial liabilities in under an hour.
- **Cost-Effective:** Assays are performed directly in cell culture plates using standard multimode detection instrumentation.
- **Flexible and Easily Automated:** The volume of reagent addition can be scaled to meet throughput needs; the assay is amenable to automation in 96- and 384-well plates.

Storage Conditions: Store the Mitochondrial Tox-Glo™ Assay components at –20°C.



Representative profiles of mitochondrial toxicity with the Mitochondrial ToxGlo™ Assay. K562 cells were plated at 10,000 cells/well in white 96-well plates (Costar®) and treated with serial dilutions of compounds resuspended in glucose-free (galactose-supplemented) RPMI 1640 media for 2 hours. **Panel A** shows no changes in ATP or membrane integrity (MI), which indicates that the compound is not a mitochondrial toxin. **Panel B.** The reduction in ATP with commensurate MI changes indicate that the compound is not a mitochondrial toxin; instead primary necrosis is taking place. **Panel C.** The reduction in ATP with no changes in MI indicates that the compound is a mitochondrial toxin. **Panel D.** The reduction in ATP with discordant changes in MI indicate that the compound is a mitochondrial toxin. **Note:** If a decrease in fluorescence, or both fluorescence and luminescence are observed, it is typically due to color quenching interferences adversely affecting assay measures. If the cells are dosed in glucose-containing medium, compounds producing ATP-depletion effects should be counter-screened in galactose-containing medium to rule out inhibition of glycolysis.

5 Cell Signaling

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

AMP Detection System

AMP-Glo™ Assay

Product	Size	Cat.#
AMP-Glo™ Assay	1,000 assays	V5011
	10,000 assays	V5012
	50,000 assays	V5013

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The AMP-Glo™ Assay generates a luminescent signal from any biochemical reaction that produces AMP as a reaction product. This versatile system can measure the activity of a broad range of enzymes, such as cyclic AMP-specific phosphodiesterases, aminoacyl-tRNA synthetases, DNA ligases and ubiquitin ligases or enzymes modulated by AMP. The AMP-Glo™ Assay is designed to quantitatively monitor the concentration of AMP in a biochemical reaction in a wide range of plate formats, including high-throughput formats. The stable luminescent signal of the assay eliminates the need for an injector-equipped luminometer and allows batch-mode processing of multiple plates. The assay can be used to determine the AMP produced either in the presence or absence of ATP as a substrate.

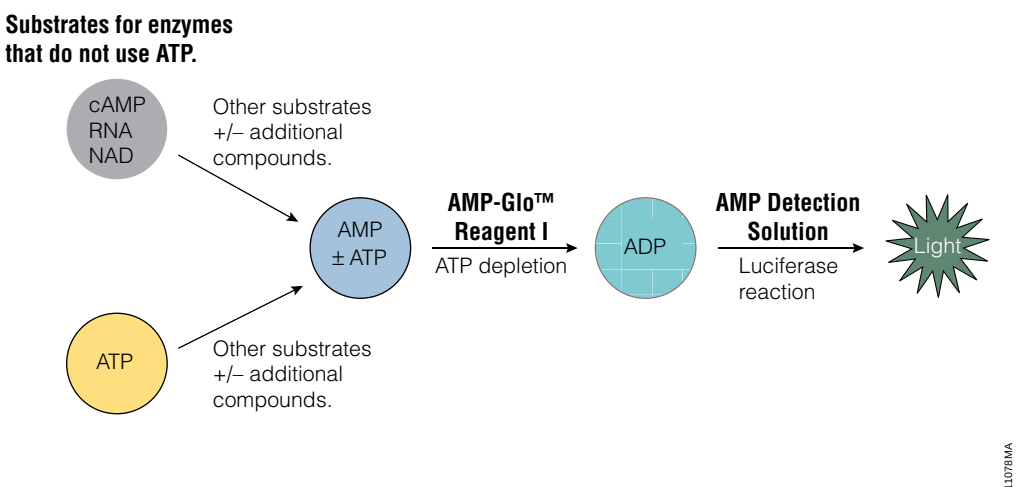
The assay contains two reagents: one to terminate the AMP-generating enzymatic reaction and simultaneously remove ATP and convert AMP produced into ADP, and a second reagent that converts the ADP to ATP followed by conversion of the ATP into a luminescent signal using the luciferin/luciferase reaction. The assay also is well suited for monitoring AMP produced in biochemical reactions catalyzed by enzymes that do not use ATP as a substrate, such as cAMP-dependent phosphodiesterases (PDE) and bacterial DNA ligases.

The AMP-Glo™ Assay exhibits a high dynamic range and produces a strong signal at low substrate conversion, making it well suited for screening low activity enzymes. The assay produces minimal false hits and Z′ values greater than 0.7.

Features:

- **High Signal Strength at Low Substrate Conversion:** Measure enzyme activity that more closely mimics physiological conditions—very well suited for low-activity enzymes.
- **Sensitive to Low Concentrations of AMP:** Requires less enzyme than other assays; cost savings.
- **Universal:** Use the assay with virtually with any AMP-producing enzyme—enables screening of a wider range of enzymes using a single platform.
- **Accurately Measures AMP Levels at a Wide Range of Starting Substrate Concentrations:** Activity measured truly reflects enzyme activity and is well suited for measuring the effects of inhibitor on enzyme activity.
- **Luminescent Readout:** Much less susceptible to interference from library compounds than fluorescent-based methods.

Storage Conditions: Store the system at –30 to –10°C. Before use, thaw all components completely at room temperature, except for the AMP-Glo™ Reagent II, which should be kept on ice after thawing. Once thawed, mix all components thoroughly before use. Once prepared, the Kinase-Glo® One Solution should be dispensed into aliquots and stored at –20°C. See the product label for expiration date.



AMP-Glo™ Assay principle. The AMP-Glo™ Assay can be used to detect activity of enzymes that catalyze any reaction that produces AMP as a reaction product, including enzymes that do not use ATP as a substrate (e.g., cAMP-specific PDE, poly(A) deadenylases, ribonucleases, bacterial DNA ligase) as well as enzymes that use ATP as a substrate (e.g., ubiquitin ligase, aminoacyl tRNA synthetase, eukaryotic DNA ligase, succinyl CoA synthetase). After completing the enzymatic reaction, adding AMP-Glo™ Reagent I terminates the reaction, removes any remaining ATP, and converts AMP to ADP. Adding AMP Detection Solution drives the conversion of ADP to ATP and the detection of ATP through the luciferase reaction. The amount of AMP produced by the reaction is proportional to the light measured and can be extrapolated using a standard curve.

cAMP-Glo™ Assay

Product	Size	Cat.#
cAMP-Glo™ Assay	300 assays	V1501
	3,000 assays	V1502
	30,000 assays	V1503

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The cAMP-Glo™ Assay is a homogeneous, bioluminescent and high-throughput assay for measuring cAMP levels in cells. The cAMP-Glo™ Assay monitors cAMP production in cells in response to the effects of test compounds on G protein-coupled receptors (GPCR). GPCRs that couple with adenylate cyclase will increase or decrease intracellular cAMP. The assay is based on the principle that cyclic AMP (cAMP) stimulates protein kinase A (PKA) holoenzyme activity, decreasing available ATP and leading to decreased light production in a coupled luciferase reaction.

The cAMP-Glo™ Assay can be performed in 96-, 384- or 1536-well plates. The cells are induced with a test compound for an appropriate period of time to modulate cAMP levels. After induction, cells are lysed to release cAMP, then the cAMP detection solution, which contains protein kinase A, is added. The Kinase-Glo® Reagent is then added to terminate the PKA reaction and detect the remaining ATP via a luciferase reaction. Plates are read using a microplate-reading luminometer. Luminescence can be correlated to the cAMP concentrations by using a cAMP standard curve. The half-life for the luminescent signal is greater than 4 hours. This extended signal half-life eliminates the need for luminometers with reagent injectors and allows batch-mode processing of multiple plates.

Features:

Fast and Easy to Use

- Assay can be completed in approximately 45 minutes.
- Homogeneous.
- Two steps following lysis of cells.

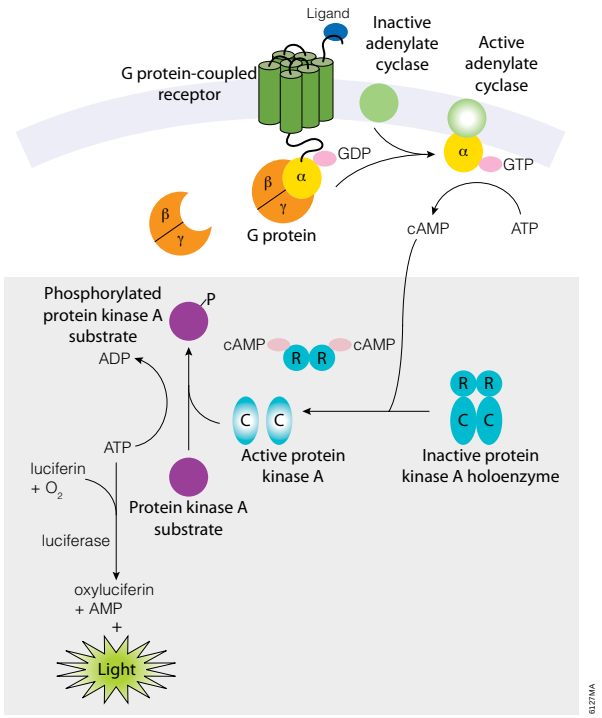
Excellent Signal-to-Noise Ratios

- Best signal:background ratio of all the cAMP assays.
- Signal:Background >200 (with cAMP), >15 (on cells).
- Easily scalable to 1536-well plate formats and beyond.

Proven Luminescent Technology

- Powered by Ultra-Glo™ Recombinant Luciferase.
- No interference by fluorescent compounds.
- Non-radioactive.

Storage Conditions: Store the system at –20°C. Once prepared, the cAMP detection solution (cAMP-Glo™ Reaction Buffer with Protein Kinase A) should not be frozen. Once prepared, the Kinase-Glo® Reagent should be dispensed into aliquots and stored at –20°C. See the product label for the expiration date.



Schematic diagram of cAMP production in cells and the cAMP-Glo™ Assay.

Available in the Helix® on-site stocking system

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cAMP-Glo™ Max Assay

Product	Size	Cat.#
cAMP-Glo™ Max Assay	2 plates	V1681
	20 plates	V1682
	10 × 20 plates	V1683

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The cAMP-Glo™ Max Assay is a homogeneous, bioluminescent and high-throughput assay to measure cyclic AMP (cAMP) levels in cells. Compounds that modulate GPCRs coupled with adenylate cyclase typically alter intracellular cAMP levels. The cAMP-Glo™ Max Assay monitors cAMP levels in cells in response to the effect of agonists, antagonists or test compounds on G protein-coupled receptors (GPCRs). The assay is based on the principle that cyclic AMP (cAMP) stimulates protein kinase A (PKA) holoenzyme activity, decreasing available ATP, leading to decreased light production in a coupled luciferase reaction.

This improved version combines the lysis and cAMP reaction buffers into the cAMP-Glo™ ONE Buffer. This new format streamlines the protocol and reduces the time needed to complete the assay. The new ONE Buffer is supplied at a 5X concentration, which provides increased flexibility for starting cell culture volumes.

The cAMP-Glo™ Max Assay can be performed in 96-, 384- or 1536-well plates. The cells are induced with a test compound for an appropriate period of time to modulate cAMP levels. After induction, cells are lysed, and the cAMP released stimulates protein kinase A in the reagent (Figure 1). The Kinase-Glo® Reagent is then added to terminate the PKA reaction and detect the remaining ATP via a luciferase reaction. Plates are read using a microplate-reading luminometer. The half-life for the luminescent signal is greater than four hours, allowing ample time to read the plates and eliminating the need for luminometers with reagent injectors.

Features:

Fast and Easy to Use

- Improved—Lysis and cAMP detection steps combined (cAMP-Glo™ ONE Buffer).
- ONE Buffer—5X concentration provides better flexibility for starting cell culture volumes.
- Assay can be completed in approximately 30 minutes.

Excellent Signal-to-Noise Ratios

- Best signal:background ratio of all the cAMP assays.
- Signal:Background >200 (with cAMP), >15 (on cells).
- Easily scalable to 1536-well plate formats and beyond.

Proven Luminescent Technology Powered by Ultra-Glo™ Recombinant Luciferase.

- No interference by fluorescent compounds.
- Non-radioactive.

Storage Conditions: Store the system at –20°C. Before use, completely thaw all components at room temperature, except for the Protein Kinase A, which should be kept on ice when not at –20°C. After thawing, mix all components thoroughly before use. Do not freeze the cAMP detection solution (cAMP-Glo™ ONE Buffer with Protein Kinase A) once it has been prepared. Once prepared, the Kinase-Glo® Reagent should be dispensed into aliquots and stored at –20°C. See the product label for the expiration date.

GloSensor™ cAMP Assay

Product	Size	Cat.#
GloSensor™ cAMP HEK293 Cell Line	2 vials	E1261
pGloSensor™-22F cAMP Plasmid	20 µg	E2301
pGloSensor™-20F cAMP Plasmid	20 µg	E1171
GloSensor™ cAMP Reagent	25 mg	E1290
	250 mg	E1291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloSensor™ cAMP Assay presents a novel approach to measuring cAMP levels in live cells. cAMP is a key second messenger involved in signal transduction of GPCRs acting through Gα-s and Gα-i proteins. The new assay is based on the GloSensor™ Technology, a genetically modified form of firefly luciferase into which a cAMP-binding protein moiety has been inserted. Upon binding of cAMP, conformational change is induced leading to increased light output. This live-cell assay excels at kinetic and modulation studies of signaling through cAMP.

Researchers can use the GloSensor™ cAMP Assay by transiently expressing a receptor of interest and the biosensor in their cell line of choice. Alternatively, researchers can choose to make stably transfected cell lines with both the biosensor and the receptor of interest. The protocol is simple: Cells are pre-equilibrated with GloSensor™ cAMP Reagent for approximately two hours; then cells are treated with specific agonists/antagonists or compounds, and luminescence is measured after 10–30 minutes. No other reagent additions or manipulations are required. Most any common luminometer with injectors is sufficient to read the assay. GloSensor™ cAMP Reagent is required for use with this assay per the GloSensor™ Limited Use Label License.

Choosing the Appropriate Plasmid

We offer two variants of the biosensor, and we recommend the pGloSensor™-22F cAMP Plasmid as the first choice for most applications.

pGloSensor™-22F cAMP Plasmid. Following cell-free expression in vitro, the version encoded by this construct shows an increased EC_{50} for activation together with increased signal-to-background ratio at cAMP saturation relative to the version encoded by the pGloSensor™-20F cAMP construct. In general, we have observed similar relationships between the two constructs when their performance is compared in living cells.

pGloSensor™-20F cAMP Plasmid. The version encoded by this construct performs well in HEK293 cells at 37°C. Luminescence from the pGloSensor™-22F cAMP Plasmid construct can be more difficult to detect at physiologic temperatures.

For a more thorough explanation of the general performance differences between the two plasmids, please consult Section 3.B, Recommendations on Choice of GloSensor™ Plasmid, in the *Technical Manual* (#TM076).

Features:

Best-in-Class Performance

- High Z′ values and large signal:background ratio values.
- Ideally suited to HTS/uHTS.
- Up to 1,000-fold changes in light output obtained.

Live-Cell, Non-Lytic Assay Format

- "Zero-step assay" greatly facilitates HTS/uHTS.
- Easy monitoring of cAMP in live cells enables a more complete analysis of receptor biology.

High Sensitivity and Increased Biological Relevance

- Easy detection of low-abundance, endogenous receptors.
- Direct detection of G_i-coupled receptor activation and inverse agonist activity in the absence of added forskolin.
- PDE inhibitors not needed.

Storage Conditions: Store the pGloSensor™ cAMP Plasmid at –20°C and store the GloSensor™ cAMP Reagent at –70°C. Store the resuspended GloSensor™ cAMP Reagent at –70°C in single-use aliquots.

PDE-Glo™ Phosphodiesterase Assay

Product	Size	Cat.#
PDE-Glo™ Phosphodiesterase Assay	1,000 assays	V1361
	10,000 assays	V1362

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PDE-Glo™ Phosphodiesterase Assay is a luminescent, high-throughput screening (HTS) method for measuring cyclic nucleotide phosphodiesterase activity from **purified** sources. Cyclic nucleotide phosphodiesterases (PDEs) are involved in a myriad of cellular processes due to their ability to hydrolyze, and thus control, the levels of the second-messenger signaling molecules cAMP and cGMP.

The availability of selective inhibitors for PDEs has facilitated their use as tools to study cyclic nucleotide signaling and paved the way to investigate the role of PDEs in cellular and tissue pathologies. The PDE-Glo™ Phosphodiesterase Assay allows lead candidates to be identified from compound libraries. The assay is designed for 384-well plates, but assay volumes can easily be scaled for 96- or 1536-well plates. The PDE-Glo™ Phosphodiesterase Assay is optimized to work with both cAMP- and cGMP-dependent phosphodiesterases. The total time required for the assay from start to finish is less than 1 hour after the PDE reaction is complete.

Features:

Versatile

- Works with **both** cAMP and cGMP PDEs.

Sensitive

- Excellent signal:background ratios.
- Scalable to 1536-well plate formats.

Fast and Easy to Use

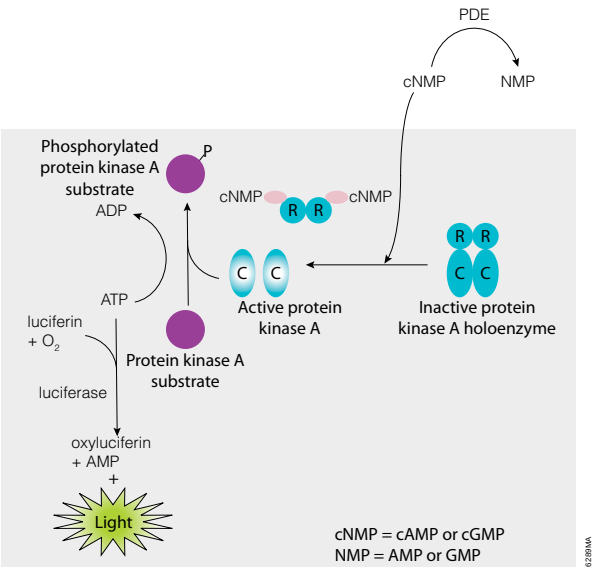
- Assay can be completed in <1 hour.
- Homogeneous.

Proven Luminescent Technology

- Powered by Ultra-Glo™ Luciferase.
- Non-radioactive.

No Interference by Fluorescent Compounds.

Storage Conditions: Store the system at –20°C. See the product label for the expiration date.



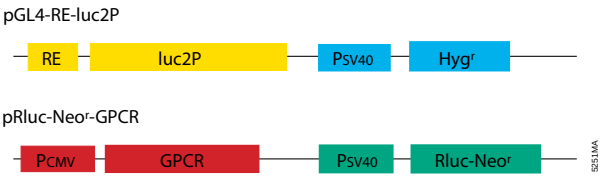
The PDE-Glo™ Phosphodiesterase Assay.

GloResponse™ Luciferase Reporter Cell Lines

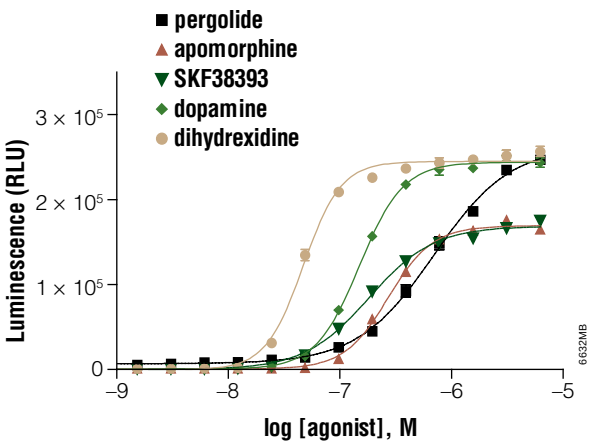
Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line	2 vials	E8530

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 69.



Two plasmids involved in the dual-luciferase GPCR assay. RE, response element/promoter; *luc2P*, destabilized firefly luciferase with PEST sequence; P_{SV40}, SV40 promoter; Hygr, hygromycin resistance gene; P_{CMV}, CMV promoter; *Rluc*-neor, *Renilla* luciferase and neomycin resistance gene fusion. PEST sequences are associated with rapidly degraded proteins.



Ranking compound potency and detection of DRD1 partial agonists. A GloResponse™ CRE-*luc2P* clone stably expressing dopamine receptor D1 was plated at 10,000 cells/well in a 96-well plate. Each agonist was serially diluted 1:2, then added to wells in replicates of four, beginning with 50µM. Cells were incubated with agonist for four hours, harvested and analyzed using the Dual-Glo™ Luciferase Assay System (Cat.# E2920). Luciferase activity was measured on the GloMax® 96 Microplate Luminometer (Cat.# E6501).

Available in the Helix® on-site stocking system
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Growth Factors

Epidermal Growth Factor, Human, Recombinant

Product	Size	Cat.#
rhEGF	100 µg	G5021
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Epidermal Growth Factor, Human, Recombinant (rhEGF) is a 6.2kDa protein that is mitogenic for a variety of mammalian cell types. rhEGF is produced from recominbant DNA expressed in *E. coli.*

Activity: rhEGF exhibits an ED_{50} value below 0.2ng/ml in the serum-free BALB/3T3 bioassay using the CellTiter 96® Non-Radioactive Cell Proliferation Assay.

Storage Conditions: Store lyophilized product at –20°C. Rehydrated rhEGF is stable for 3 months at –20°C. Avoid repeated freeze-thaw cycles. When stored and handled properly, lyophilized rhEGF is stable for at least 6 months from the date of purchase.

Human Brain Derived Neurotrophic Factor (BDNF)

Product	Size	Cat.#
rhBDNF	5 µg	G1491
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Brain Derived Neurotrophic Factor, Human, Recombinant (rhBDNF) is a 27kDa homodimer originally shown to promote the outgrowth of spinal sensory neurons. rhBDNF is produced from recombinant DNA expressed in *E. coli.*

Storage Conditions: Stable for 6 months when stored desiccated at –20°C. Store reconstituted product in working aliquots at –20°C, where it is stable for 3 months. Avoid multiple freeze-thaw cycles.

Human Glial Cell-Line Derived Neurotrophic Factor (GDNF)

Product	Size	Cat.#
rhGDNF	5 µg	G2781
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Human Glial Cell-Lined Derived Neurotrophic Factor (rhGDNF) is a 30kDa homodimer consisting of two disulfide-linked, 134 amino acid subunits. GDNF promotes dopamine uptake and survival of midbrain neurons and is also a survival factor for developing motor neurons, purified rat embryo spinal neurons and nodose sensory neurons. rhGDNF is produced from recombinant DNA expressed in *E. coli.*

Storage Conditions: Stable for 6 months when stored desiccated at –20°C. Store reconstituted product in working aliquots at –20°C, where it is stable for 3 months from date of purchase. Avoid multiple freeze-thaw cycles.

Nerve Growth Factor, 2.5S, Murine

Product	Size	Cat.#
mNGF, 2.5S	100 µg	G5141
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Murine 2.5S Nerve Growth Factor (2.5S mNGF) mediates phosphorylation of specific intracellular proteins. Target cells of this molecule include sympathetic and sensory neurons and derivatives of nerve cells such as adrenal medulla pheochromocytoma (PC12) cells. 2.5S mNGF is a 26kDa protein composed of two identical 118 amino acid chains. Murine 2.5S Nerve Growth Factor is purified from male mouse submaxillary glands by the method of Bocchini and Angeletii.

Activity: 2.5S mNGF exhibits an ED_{50} value below 2ng/ml using a PC-12 serum-free survival assay.

Storage Conditions: Store lyophilized Murine 2.5S NGF desiccated at –20°C, where it is stable for at least six months from the date of purchase. Store reconstituted Murine 2.5S NGF in working aliquots at –20°C, where it is stable for up to 6 months. Avoid multiple freeze-thaw cycles.

rhFGF, Basic

Product	Size	Cat.#
rhFGF, Basic	25 µg	G5071
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Fibroblast Growth Factor, Basic, Human, Recombinant (rhFGF, Basic), is a 17.5kDa polypeptide containing 154 amino acids. It induces proliferation of multiple types of cells in vitro and demonstrates potent angiogenic activity in vivo. rhFGF, Basic, is produced from recombinant DNA expressed in *E. coli.*

rhIGF-I

Product	Size	Cat.#
rhIGF-I	25 µg	G5111
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Insulin-Like Growth Factor-I, Human, Recombinant (rhIGF-I), is a 7.6kDa protein containing 70 amino acid residues. It stimulates the proliferation of a wide range of cell types. rhIGF-I is a highly purified, biologically active, recombinant molecule, produced in *E. coli.*

rhTNF-α

Product	Size	Cat.#
rhTNFα	10 µg	G5241
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Tumor Necrosis Factor-α, Human, Recombinant (rhTNF-α), is a pleiotropic cytokine produced predominantly by activated monocytes/macrophages. Biological effects of this molecule include induction of apoptosis, cytolysis or cytostasis of tumor cells, activation of polymorphonuclear leukocytes, antiviral activity and induction of IL-1 or colony-stimulating factor expression. rhTNF-α is a 17kDa protein containing 157 amino acid residues that is produced from a recombinant DNA expressed in *E. coli.*

Histone Deacetylase Assays

HDAC-Glo™ I/II Assays and Screening Systems

Product	Size	Cat.#
HDAC-Glo™ I/II Assay	10 ml	G6420
	5 × 10 ml	G6421
	100 ml	G6422
HDAC-Glo™ I/II Screening System	10 ml	G6430
	5 × 10 ml	G6431

Available Separately	Size	Conc.	Cat.#
Trichostatin A	10 µl	10 mM	G6560
HeLa Nuclear Extract	10 µl	5 mg/ml	G6570
HDAC-Glo™ I/II Control Substrate	10 µl		G6550

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HDAC-Glo™ I/II Assays and Screening Systems are single-reagent-addition, homogeneous, luminescent assays that measure the relative activity of histone deacetylase (HDAC) class I and II enzymes from cells, extracts or purified enzyme sources. The assays use an acetylated, live-cell-permeant, luminogenic peptide substrate that can be deacetylated by HDAC activities. Deacetylation of the peptide aminoluciferin substrate is measured by a coupled enzymatic system in which a protease in the Developer Reagent cleaves the deacetylated peptide from the aminoluciferin substrate, releasing aminoluciferin, which is quantified in a reaction using Ultra-Glo™ recombinant firefly luciferase. The assay reaction is typically complete within 15–45 minutes with no sample manipulation. The HDAC-mediated luminescent signal is persistent, with a half-life of greater than 3 hours, allowing batch processing of multiwell plates. The HDAC assay is broadly useful for class I and II enzymes.

The Trichostatin A, included in the HDAC-Glo™ I/II Screening Systems or available separately, is a known pan HDAC inhibitor that may be used as a positive control inhibitor. The Trichostatin A is supplied at a concentration of 10mM in DMSO.

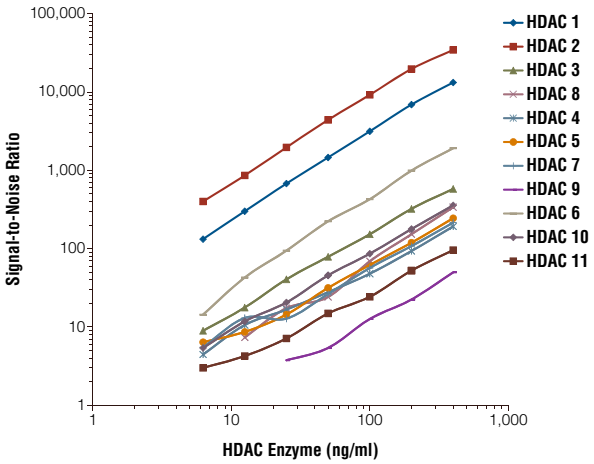
The HeLa Nuclear Extract, included in the HDAC-Glo™ I/II Screening Systems or available separately, may be used as a source of histone deacetylase activity. The diluted extract also can be used as an HDAC-Glo™ I/II Assay chemistry control.

The HDAC-Glo™ I/II Control Substrate, only available separately, is a non-acetylated form of the HDAC-Glo™ I/II Substrate with the same amino acid sequence and can be used with the HDAC-Glo™ I/II Assays and Screening Systems to confirm true HDAC inhibition in secondary screens. The Control Substrate is supplied at a concentration of 10mM and is sufficient for 480 assays in 96-well plate format when combined with the HDAC-Glo™ Reagent prepared with components in the HDAC-Glo™ I/II Assays or Screening Systems.

Features:

- **Simple Measurement of Deacetylating Activities:** Use a single-reagent-addition, homogeneous, add-mix-measure protocol for easy implementation from benchtop to screening.
- **Highly Sensitive:** Obtain 10- to 100-fold higher sensitivity than comparable fluorescence methods.
- **Fast Data Acquisition:** Maximum signal in as little as 15 minutes with persistent glow-type steady-state signal, making the protocol amenable to automation in high-throughput formats and compatible with luminometers without injectors.
- **Flexible to Sample Type:** Use with viable cells, extracts or purified recombinant enzyme sources.

Storage Conditions: Store HDAC-Glo™ Assay components and HDAC-Glo™ I/II Control Substrate (sold separately) at –20°C. Store HeLa Nuclear Extract at –70°C.



Broad linearity with HDAC Class I and II enzymes.

Available in the Helix® on-site stocking system

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SIRT-Glo™ Assays and Screening Systems

Product	Size	Cat.#
SIRT-Glo™ Assay	10 ml	G6450
	5 × 10 ml	G6451
	100 ml	G6452
SIRT-Glo™ Screening System	10 ml	G6470
	5 × 10 ml	G6471

Available Separately	Size	Conc.	Cat.#
Nicotinamide	30 µl	1 M	G6540
HeLa Nuclear Extract	10 µl	5 mg/ml	G6570
SIRT-Glo™ Control Substrate	35 µl		G6460

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SIRT-Glo™ Assays and Screening Systems are single-reagent-addition, homogeneous, luminescent assays that measure the relative activity of the NAD$^+$-dependent histone deacetylase (HDAC) class III enzymes (sirtuins; SIRTs) from purified enzyme sources. The assays use an acetylated, luminogenic peptide substrate that can be deacetylated by SIRT activities. Deacetylation of the peptide aminoluciferin substrate is measured using a coupled enzymatic system in which a protease in the Developer Reagent cleaves the deacetylated peptide from the aminoluciferin substrate, releasing aminoluciferin, which is quantified in a reaction using Ultra-Glo™ recombinant firefly luciferase. The assay reaction is typically complete within 15–45 minutes with no sample manipulation. The SIRT-mediated luminescent signal is persistent with a half-life of greater than 3 hours, allowing batch processing of multiwell plates. The SIRT-Glo™ Assay is broadly useful for NAD$^+$-dependent Sirtuin enzymes.

Nicotinamide, included in the SIRT-Glo™ Screening Systems or available separately, is a known inhibitor of SIRTs and used as a positive control inhibitor. Nicotinamide is supplied at a concentration of 1M in SIRT-Glo™ Buffer.

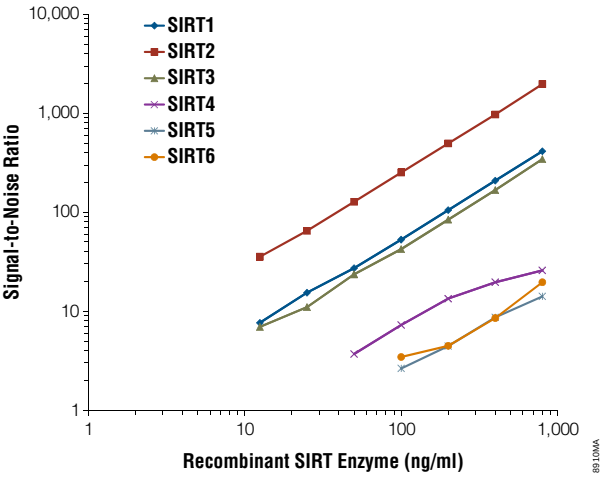
The HeLa Nuclear Extract, included in the SIRT-Glo™ Screening Systems or available separately, may be used as an assay chemistry control. HeLa Nuclear Extract is supplied at a concentration of 5mg/ml.

The SIRT-Glo™ Control Substrate, only available separately, is a non-acetylated form of the SIRT-Glo™ Substrate with the same amino acid sequence and can be used with the SIRT-Glo™ Assays and Screening Systems to confirm true SIRT inhibition in secondary screens. The Control Substrate is supplied at a concentration of 10mM and is sufficient for 480 assays in 96-well plate format when combined with the SIRT-Glo™ Reagent prepared with components in the SIRT-Glo™ Assays or Screening Systems.

Features:

- **Simple Measurement of Deacetylating Activities:** Use a single-reagent-addition, homogeneous, add-mix-measure protocol for easy implementation from benchtop to screening.
- **Highly Sensitive:** Achieve 10- to 100-fold higher sensitivity than comparable fluorescence methods.
- **Fast Data Acquisition:** Measure maximum signal in as little as 10–15 minutes with persistent glow-type steady-state signal.

Storage Conditions: Store the SIRT-Glo™ Assay components and SIRT-Glo™ Control Substrate at –20°C. Store HeLa Nuclear Extract at –70°C.



Broad linearity and isoenzyme utility.

Lipid Kinase Assays and Reagents

Product	Size	Cat.#
PI3K-Glo™ Class I Profiling Kit	1 each	V1690
ADP-Glo™ Kinase Assay with PI:3PS	10,000 assays	V1782
ADP-Glo™ Kinase Assay with PIP2:3PS	10,000 assays	V1792
ADP-Glo™ Kinase Assay with PI:3PS	1,000 assays	V1781
ADP-Glo™ Kinase Assay with PIP2:3PS	1,000 assays	V1791
Available Separately	**Size**	**Cat.#**
PI3K (p110α/p85α), 20µg	200 µl	V1721
PI3K (p110α[E545K]/p85α), 20µg	200 µl	V1731
PI3K (p110α[H1047R]/p85α), 20µg	200 µl	V1741
PI3K (p110β/p85α), 20µg	200 µl	V1751
PI3K (p120γ), 20µg	200 µl	V1761
PI3K (p110δ/p85α), 20µg	200 µl	V1771
PIP2:3PS Lipid Kinase Substrate, 0.25mg	0.25 ml	V1701
PI:3PS Lipid Kinase Substrate, 0.5mg	0.5 ml	V1711

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Phosphatidylinositol (PI) and its phosphorylated derivates, collectively called phosphoinositides, are important second messengers that are critical as signaling molecules and for cellular membrane remodeling. These derivatives are generated by a family of kinases called phosphoinositide lipid kinases (PIKs). Nineteen PIK isoforms have been identified in mammals. Based on their ability to preferentially phosphorylate the hydroxyl group of the inositol ring on position 3, 4 or 5, they have been broadly classified into three major families: phosphoinositide 3-kinases (PI3Ks), phosphoinositide 4-kinases (PI4Ks) and phosphoinositide phosphate-kinases (PIP5Ks and PIP4Ks).

Promega lipid kinase enzymes, substrates and detection systems provide a complete set of reagents for performing phosphoinositide lipid kinase (PIK) reactions using a luminescent ADP-detection platform, the ADP-Glo™ Kinase Assay. The reagents include purified human recombinant proteins of Class I PI3Ks, optimized reaction buffer and ready-to-use lipid kinase substrates. The enzymes are available separately or can be purchased as part of the **PI3K-Glo™ Class I Profiling Kit**, which contains PI3Ks (α, β, γ and δ; 5µg each), PIP2:3PS Lipid Kinase Substrate (0.25mg) and the ADP-Glo™ Kinase Assay, 1,000 assays. The lipid substrates are supplied as frozen small unilamellar vesicles containing a mixture of phosphatidylinositol (PI) or phosphoinositol-4,5-bisphosphate (PIP2) at a 1:3 ratio with phosphatidylserine (PS) as carrier lipid. A substrate composed of PIP2 and PS at a 1:3 ratio was optimized to use with class I PI3Ks. A substrate composed of PI and PS at a 1:3 ratio was demonstrated to be recognized by the majority of family members and provides a universal PI lipid kinase substrate.

Assay Principle. The lipid kinase reaction is performed by incubating lipid substrate (PI:3PS or PIP2:3PS) with a recombinant enzyme and ATP, and the kinase activity is measured using the ADP-Glo™ Kinase Assay. The ADP-Glo™ Kinase Assay is performed in two steps. After the kinase reaction, an ATP-depletion reagent is added to terminate the lipid kinase reaction and deplete any remaining ATP, leaving only ADP. Next, a detection reagent is added to simultaneously convert ADP to ATP and allow the newly synthesized ATP to be converted to light using a coupled luciferase/luciferin reaction.

Features:

Employ Complete Solutions for Class I PI3Ks

- Purified human recombinant enzymes with high specific activity.
- Ready-to-use lipid substrate (PI or PIP2).
- Universal reaction buffer formulation.
- Highly sensitive detection assay.

Observe Excellent Selectivity: High signal-to-background ratios even at low % conversion of substrate.

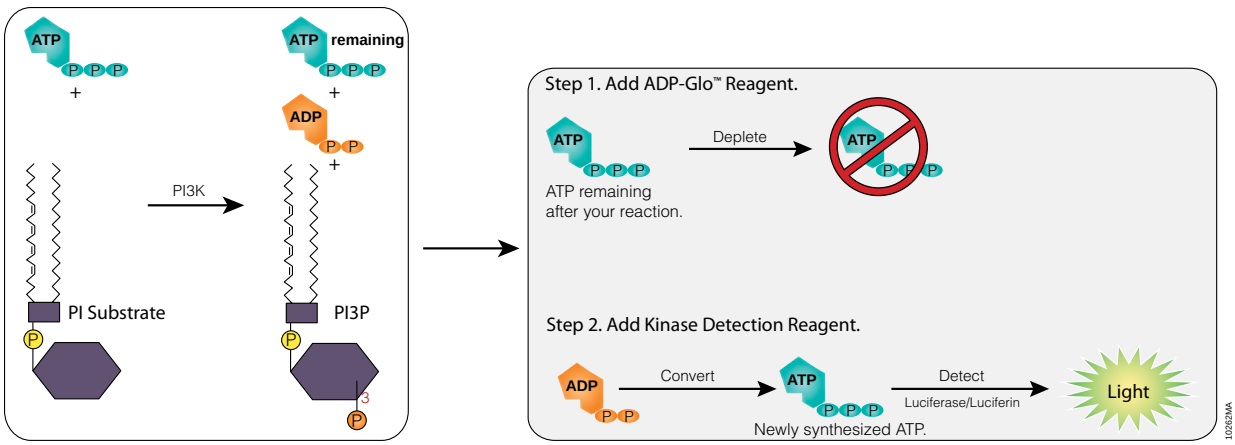
Obtain Reliable Results: The broad dynamic range, low background and excellent sensitivity result in less ambiguous data.

Save Time: Homogeneous assay with simple "add-and-read" format.

Avoid False Hits: The special formulation and luminescent signal results in low false-hit rate.

Save Money: Easily scalable to 1,536-well format, reducing cost per well.

Storage Conditions: Recombinant PI3K Enzymes: Store recombinant PI3K enzymes below –65°C. **Lipid Substrates:** Store lipid substrates below –65°C. **Buffers:** Store 5X PI3K Reaction Buffer, 10X Lipid Dilution Buffer and 1M $MgCl_2$ at –30°C to –10°C. **ADP-Glo™ Kinase Assay:** Upon receiving ADP-Glo™ Kinase Assay, remove ATP and store it below –65°C. Store the rest of the components at –30º to –10ºC.



Lipid Kinase Reaction

ADP-Glo™ Assay

Principle of the ADP-Glo™ Lipid Kinase Assay.

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ADP-Glo™ Kinase Assay

Product	Size	Cat.#
ADP-Glo™ Kinase Assay	1,000 assays	V9101
	10,000 assays	V9102
	100,000 assays	V9103
ADP-Glo™ Kinase Assay, Bulk Packaged	100,000 assays	V9104

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ADP-Glo™ Kinase Assay is a luminescent kinase assay that measures ADP formed from a kinase reaction; ADP is converted into ATP, which is converted into light by Ultra-Glo™ Luciferase. The luminescent signal positively correlates with kinase activity. The assay is well suited for measuring the effects chemical compounds have on the activity of a broad range of purified kinases, making it ideal for both primary screening as well as kinase selectivity profiling. The ADP-Glo™ Kinase Assay can be used to monitor the activity of virtually any ADP-generating enzyme (e.g., kinase or ATPase) using up to 1mM ATP.

The assay is performed in two steps; first, after the kinase reaction, an equal volume of ADP-Glo™ Reagent is added to terminate the kinase reaction and deplete the remaining ATP. In the second step, the Kinase Detection Reagent is added, which simultaneously converts ADP to ATP and allows the newly synthesized ATP to be measured using a coupled luciferase/luciferin reaction (see figure).

The ADP-Glo™ Kinase Assay has a high dynamic range and produces a strong signal at low ATP to ADP conversion, making it well suited for screening low activity kinases such as growth factor receptor tyrosine kinases. The assay produces minimal false hits and Z′ values of greater than 0.8.

Several Kinase Enzyme Systems are available. Visit **www.promega.com/kinase/** to see the collection.

Features:

- **High Signal Strength at Low ATP Conversion:** Users can measure kinase activity that more closely mimics physiological conditions, making the assay very well suited for low-activity kinases such as receptor tyrosine kinases.
- **Sensitive:** The assay is sensitive to low concentrations of ADP, requiring less enzyme than other assays; cost savings.
- **Universal:** The assay can be used with virtually with any kinase—enables researchers to screen a wider range of kinases in-house, reducing dependency on costly outsourcing of kinase selectivity profiling.
- **Accurate:** Accurately measures ADP levels at a wide range of starting ATP concentrations; users assured that activity measured truly reflects kinase activity and produces accurate IC_{50} values comparable to radioactivity-based assays.
- **Accommodate Wide Range of ATP Levels:** The assay can be used at ATP concentrations up to 1mM, important for kinases with high K_m values for ATP.
- **Stable Luminescent Signal:** Users can perform batch plate processing without need for strictly timed incubations; flexible.

Storage Conditions: Store the system at –20°C. Before use, thaw all reagents completely at room temperature. Once thawed, components should be thoroughly mixed before use. Once prepared, the Kinase Detection Reagent (Kinase Detection Buffer + Substrate) should be divided into aliquots and stored at –20°C.

ADP-Glo™ Max Assay

Product	Size	Cat.#
ADP-Glo™ Max Assay	1,000 assays	V7001
	10,000 assays	V7002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ADP-Glo™ Max Assay is a luminescent ADP detection assay that provides a universal, homogeneous, high-throughput screening method to measure ATPase or kinase activity by quantifying the amount of ADP produced in a reaction. The assay can be used to monitor the activity of virtually any ADP-generating enzyme (e.g., kinase or ATPase) when higher ATP concentration is required (up to 5mM). The ADP-Glo™ Max Assay produces a strong signal that positively correlates with enzyme activity and can be adapted to a multitude of plate formats.

The assay is performed in two steps: first, after the completion of the ADP-producing reaction, an equal volume of ADP-Glo™ Reagent is added to terminate the reaction and deplete the remaining ATP. Second, the ADP-Glo™ Max Detection Reagent is added to simultaneously convert ADP to ATP, and the latter is converted to light in a coupled reaction with luciferase/luciferin.

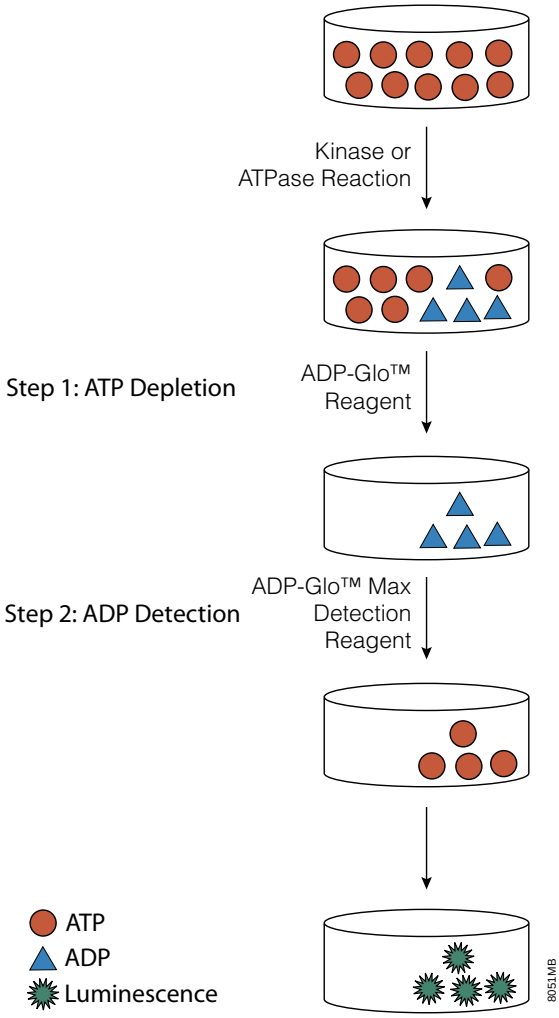
The ADP-Glo™ Max Assay has a high dynamic range and produces a strong signal at low ATP to ADP conversion, making it well suited for screening low-activity ATPases such as drug membrane transporters and heat shock proteins. The assay produces minimal false hits and Z′ values of greater than 0.7.

Several Kinase Enzyme Systems are available. Visit **www.promega.com/kinase/** to see the collection.

Features:

- **High Signal Strength at Low ATP Conversion:** Users can measure enzyme activity that more closely mimics physiological conditions. This makes the assay very well suited for low-activity ATPases/kinases.
- **Sensitive:** The assay is sensitive to low concentrations of ADP, requiring less enzyme than other assays; cost savings.
- **Universal:** The assay can be used with virtually with any ADP-producing enzyme—enables researchers to screen a wider range of enzymes using a single platform.
- **Accommodate Wide Range of ATP Levels:** The assay can be used at ATP concentrations up to 5mM, important for enzymes with high K_m values for ATP and for mode of action studies.
- **Accurate:** Accurately measures ADP levels at a wide range of starting ATP concentrations; users assured that activity measured truly reflects enzyme activity and produces accurate IC_{50} values comparable to radioactivity-based assays.

Storage Conditions: Store the system at –20°C. Before use, thaw all components completely at room temperature. Once thawed, mix all components thoroughly before use. Because ATP is naturally prone to hydrolysis after freeze-thaw cycles dispense into single-use aliquots and store at –20°C. Once prepared, dispense, ADP-Glo™ Max Detection Reagent (ADP-Glo™ Max Detection Buffer + Substrate) into aliquots and store at –20°C. ADP-Glo™ Max Detection Buffer may form a precipitate when thawed. See Section 3.A of the Technical Manual for a protocol to dissolve any precipitate. For convenience, ADP-Glo™ Reagent and ADP-Glo™ Max Detection Reagent may be kept at room temperature (22°C) for 24 hours without loss of signal.



Principle of the ADP-Glo™ Max Assay. The assay is performed in two steps: 1) after the ATPase or kinase reaction, ADP-Glo™ Reagent is added to terminate the reaction and deplete the remaining ATP; and 2) the ADP-Glo™ Max Detection Reagent is added to convert ADP to ATP and allow the newly synthesized ATP to be measured using a luciferase/luciferin reaction. The light generated correlates to ADP present and ATPase activity.

Kinase Enzyme Systems

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
ABL1 Kinase Enzyme System	V1901	10µg	ABL1, 10µg (Human, recombinant; amino acids 27–end)	~135kDa	Abltide (EAIYAAPFAKKK); derived from the C-terminus of ABL	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ABL1 Kinase Enzyme System	V9051	1 each				
ABL1 (E255K) Kinase Enzyme System	V5098	10µg	ABL1 (E255K), 10µg (Human, recombinant; amino acids 27–end)	~160kDa	Abltide (EAIYAAPFAKKK); derived from the C-terminus of ABL	Reaction Buffer A, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + ABL1 (E255K) Kinase Enzyme System	V5099	1 each				
ABL1 (T315I) Kinase Enzyme System	V5320	10µg	ABL1 (T315I), 10µg (Human, recombinant; amino acids 27–end)	~160kDa	Abltide (EAIYAAPFAKKK); derived from the C-terminus of ABL	Reaction Buffer A, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + ABL1 (T315I) Kinase Enzyme System	V5321	1 each				
ABL1 (Y253F) Kinase Enzyme System	V5086	10µg	ABL1 (Y253F), 10µg (Human, recombinant; amino acids 27–end)	~160kDa	Abltide (EAIYAAPFAKKK); derived from the C-terminus of ABL	Reaction Buffer A, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + ABL1 (Y253F) Kinase Enzyme System	V5087	1 each				
ACK Kinase Enzyme System	V4050	10µg	ACK, 10µg (Human, recominant; amino acids 110–476)	~66kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + ACK Kinase Enzyme System	V4051	1 each				
AKT1 Kinase Enzyme System	V1911	10µg	AKT1, 10µg (Human, recombinant full-length)	~85kDa	Akt (PKB) substrate (CKRPRAASFAE); derived from the N-terminus of GSK3	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + AKT1 Kinase Enzyme System	V9061	1 each				
AKT2 Kinase Enzyme System	V3861	10µg	AKT2, 10µg (Human, recombinant full-length)	~85kDa	Modified AKT substrate peptide (modified CKRPRAASFAE); based on the N-terminus of GSK3	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + AKT2 Kinase Enzyme System	V9041	1 each				
AKT3 Kinase Enzyme System	V4010	10µg	AKT3, 10µg (Human, recombinant full-length)	~85kDa	Akt (SGK) substrate peptide (RPRAATF); derived from the N-terminus of GSK3	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + AKT3 Kinase Enzyme System	V4011	1 each				
ALK2 Kinase Enzyme System	V4492	10µg	ALK2, 10µg (Human, recombinant; amino acids 147–end)	~67kDa	Native Casein Protein; purified from bovine milk	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ALK2 Kinase Enzyme System	V4493	1 each				
ALK4 Kinase Enzyme System	V4508	10µg	ALK4, 10µg (Human, recombinant; amino acids 150–end)	~64kDa	Native Casein Protein; purified from bovine milk	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ALK4 Kinase Enzyme System	V4509	1 each				
ALK6 Kinase Enzyme System	V4052	10µg	ALK6, 10µg (Human, recombinant; amino acids 149–end)	~68kDa	TGFBR1 Peptide (KKKVLTQMGSPSIRC-S(pS)VS); derived from human SMAD3 (215–230)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ALK6 Kinase Enzyme System	V4053	1 each				
AMPK (A1/B1/G1) Kinase Enzyme System	V1921	10µg	AMPK (A1/B1/G1), 10µg (Human, recombinant full-length)	~68kDa (A1) ~38kDa (B1) ~40kDa (G1)	SAMStide (HMRSAMSGLHLVKRR); derived from the mouse acetyl-Coenzyme A carboxylase alpha (amino acids 73-85).	Reaction Buffer, DTT, AMP Solution
ADP-Glo™ Kinase Assay + AMPK (A1/B1/G1) Kinase Enzyme System	V9021	1 each				
AMPK (A1/B1/G2) Kinase Enzyme System	V4012	10µg	AMPK (A1/B1/G2), 10µg (Human, recombinant full-length)	~68kDa (A1) ~38kDa (B1) ~65kDa (G2)	SAMStide (HMRSAMSGLHLVKRR); derived from the mouse acetyl-Coenzyme A carboxylase alpha (amino acids 73–85)	Reaction Buffer, DTT, AMP Solution
ADP-Glo™ Kinase Assay + AMPK (A1/B1/G2) Kinase Enzyme System	V4013	1 each				
AMPK (A2/B1/G1) Kinase Enzyme System	V4014	10µg	AMPK (A2/B1/G1), 10µg (Human, recombinant full-length)	~69kDa (A2) ~38kDa (B1) ~40kDa (G1)	SAMStide (HMRSAMSGLHLVKRR); derived from the mouse acetyl-Coenzyme A carboxylase alpha (amino acids 73–85)	Reaction Buffer, DTT, AMP Solution
ADP-Glo™ Kinase Assay + AMPK (A2/B1/G1) Kinase Enzyme System	V4015	1 each				
ASK1 Kinase Enzyme System	V3881	10µg	ASK1, 10µg (Human, recombinant; amino acids 649–946)	~60kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ASK1 Kinase Enzyme System	V9481	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
Aurora A Kinase Enzyme System	V1931	10µg	Aurora A, 10µg (Human, recombinant full-length)	~72kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + Aurora A Kinase Enzyme System	V9081	1 each				
Aurora B Kinase Enzyme System	V3971	10µg	Aurora B, 10µg (Human, recombinant full-length)	~68kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + Aurora B Kinase Enzyme System	V9181	1 each				
AXL Kinase Enzyme System	V3961	10µg	AXL, 10µg (Human, recombinant; amino acids 473–end)	~55kDa	Axltide (KKSRGDYMTMQIG); derived from the mouse insulin receptor substrate 1 (amino acids 979-989)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + AXL Kinase Enzyme System	V9171	1 each				
BMX Kinase Enzyme System	V4512	10µg	BMX, 10µg (Human, recombinant full-length)	~110kDa	Poly (4:1 Glu, Tyr) peptide	Reaction Buffer, $MnCL_2$, DTT
ADP-Glo™ Kinase Assay + BMX Kinase Enzyme System	V4513	1 each				
BRK Kinase Enzyme System	V4054	10µg	BRK, 10µg (Human, recombinant full-length)	~80kDa	Poly (4:1 Glu, Tyr) peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + BRK Kinase Enzyme System	V4055	1 each				
BTK Kinase Enzyme System	V2941	10µg	BTK, 10µg (Human, recombinant full-length)	~78kDa	Poly (4:1 Glu, Tyr) peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + BTK Kinase Enzyme System	V9071	1 each				
CAMK1γ Kinase Enzyme System	V4016	10µg	CAMK1γ, 10µg (Human, recombinant full-length)	~80kDa	Autocamtide 2 peptide (KKALRRQETVDAL-amide); derived from the autophosphorylation site (amino acids 283–290) on CaMKII	Reaction Buffer, DTT, Ca^{2+}/Calmodulin solution
ADP-Glo™ Kinase Assay + CAMK1γ Kinase Enzyme System	V4017	1 each				
CAMK2α Kinase Enzyme System	V4018	10µg	CAMK2α, 10µg (Human, recombinant full-length)	~74kDa	Autocamtide 2 peptide (KKALRRQETVDAL-amide); derived from the autophosphorylation site (amino acids 283–290) on CaMKII	Reaction Buffer, DTT, Ca^{2+}/Calmodulin solution
ADP-Glo™ Kinase Assay + CAMK2α Kinase Enzyme System	V4019	1 each				
CAMK2γ Kinase Enzyme System	V3531	10µg	CAMK2γ, 10µg (Human, recombinant; C-terminal truncation)	~60kDa	Autocamtide-2 (KKALRRQETVDAL-amide); derived from the autophosphorylation site (amino acids 283-290) on CaMKII	Reaction Buffer, DTT, Ca^{2+}/Calmodulin solution
ADP-Glo™ Kinase Assay + CAMK2γ Kinase Enzyme System	V9201	1 each				
CAMK4 Kinase Enzyme System	V2951	10µg	CAMK4, 10µg (Human, recombinant full-length)	~79kDa	Autocamtide-2 (KKALRRQETVDAL-amide); derived from the autophosphorylation site (amino acids 283-290) on CaMKII	Reaction Buffer, DTT, Ca^{2+}/Calmodulin solution
ADP-Glo™ Kinase Assay + CAMK4 Kinase Enzyme System	V9091	1 each				
CAMKK1 Kinase Enzyme System	V4470	10µg	CAMKK1, 10µg (Human, recombinant full-length)	~94kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT, Ca^{2+}/Calmodulin Solution
ADP-Glo™ Kinase Assay) CAMKK1 Kinase Enzyme System	V4471	1 each				
CDC7/DBF4 Kinase Enzyme System	V5088	10µg	CDC7/DBF4, 10µg (Human, recombinant full-length)	~94kDa (CDC7) ~125kDa (DBF4)	PDKtide (KTFCGTPEYLAPEVRREPRILSEEEQEM-FRDFDYIADWC); derived from two human proteins: residues 1–14 are based on AKT1 (307–320) and residues 16–39 are based on PKN2/PRK2 (961–984)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDC7/DBF4 Kinase Enzyme System	V5089	1 each				
CDK1/CyclinA2 Kinase Enzyme System	V2961	10µg	CDK1/CyclinA2, 10µg (Human, recombinant full-length)	~59kDa (CDK1) ~78kDa (CyclinA2)	Histone H1- Native histone H1; purified from calf thymus tissues	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK1/CyclinA2 Kinase Enzyme System	V9211	1 each				
CDK2/CyclinA2 Kinase Enzyme System	V2971	10µg	CDK2/CyclinA2, 10µg (Human, recombinant full-length)	~58kDa (CDK2) ~78kDa (CyclinA2)	Histone H1- Native histone H1; purified from calf thymus tissues	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK2/CyclinA2 Kinase Enzyme System	V9221	1 each				
CDK2/CyclinE1 Kinase Enzyme System	V4488	10µg	CDK2/CyclinE1, 10µg (Human, recombinant full-length)	~58kDa (CDK2) ~73kDa (CyclinE1)	Native Histone H1 Protein; purified from calf thymus tissues	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK2/CyclinE1 Kinase Enzyme System	V4489	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Available in the Helix® on-site stocking system

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
CDK3/CyclinE1 Kinase Enzyme System	V4490	10µg	CDK3/CyclinE1, 10µg (Human, recombinant full-length)	~60kDa (CDK3) ~73kDa (CyclinE1)	Native Histone H1 Protein; purified from calf thymus tissues	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK3/CyclinE1 Kinase Enzyme System	V4491	1 each				
CDK5/p25 Kinase Enzyme System	V3231	10µg	CDK5/p25, 10µg (Human, recombinant full-length)	~59kDa (CDK) ~49kDa (p25)	Histone H1 protein	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK5/p25 Kinase Enzyme System	V9541	1 each				
CDK5/p35 Kinase Enzyme System	V3271	10µg	CDK5/p35, 10µg (Human, recombinant full-length)	~59kDa (CDK) ~60kDa (p35)	Histone H1 protein	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK5/p35 Kinase Enzyme System	V9551	1 each				
CDK6/CyclinD3 Kinase Enzyme System	V4510	10µg	CDK6/CyclinD3, 10µg (Human, recombinant full-length)	~40kDa (CDK6) ~35kDa (CyclinD3)	Native Histone H1 Protein; purified from calf thymus tissues	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK5/CyclinD3 Kinase Enzyme System	V4511	1 each				
CDK9/CyclinK Kinase Enzyme System	V4104	10µg	CDK9/CyclinK, 10µg (Human, recombinant full-length)	~68kDa (CDK9) ~67kDa (CyclinK)	PDKtide (KTFCGTPEYLAPEVRREPRIL-SEEEQEMFRDFDYIADWC); residues 1–14 derived from AKT1 (307–320), and residues 16–39 derived from PKN2/PRK2 (961–984)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CDK9/CyclinK Kinase Enzyme System	V4105	1 each				
CHK1 Kinase Enzyme System	V1941	10µg	CHK1, 10µg (Human, recombinant full-length)	~82kDa	CHKtide (KKKVSRSGLYRSPSMPENLNRPR); derived from the human CDC25C protein isoform A (amino acids 205-225)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CHK1 Kinase Enzyme System	V9241	1 each				
CHK2 Kinase Enzyme System	V4020	10µg	CHK2, 10µg (Human, recombinant full-length)	~88kDa	Chktide (KKKVSRSGLYRSPSMPENLNRPR); derived from human CDC25C protein isoform A (amino acids 205–225)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CHK2 Kinase Enzyme System	V4021	1 each				
CK1α1 Kinase Enzyme System	V4484	10µg	CK1α1, 10µg (Human, recombinant full-length)	~62kDa	Casein, dephosphorylated; native protein purified from bovine milk	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CK1α1 Kinase Enzyme System	V4485	1 each				
CK1ε Kinase Enzyme System	V4160	10µg	CKε1, 10µg (Human recombinant full-length)	~72kDa	Casein, dephosphorylated; native protein purified from bovine milk	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CK1ε Kinase Enzyme System	V4161	1 each				
CK1γ1 Kinase Enzyme System	V4100	10µg	CK1γ1, 10µg (Human, recombinant amino acids 21–end)	~70–76kDa	Native Casein Protein; purified from bovine milk	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CK1γ1 Kinase Enzyme System	V4101	1 each				
CK2α1 Kinase Enzyme System	V4482	10µg	CK2α1, 10µg (Human, recombinant full-length)	~70kDa	Native Casein Protein; purified from bovine milk	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CK2α1 Kinase Enzyme System	V4483	1 each				
c-KIT Kinase Enzymer System	V4498	10µg	c-KIT, 10µg (Human, recombinant; amino acids 544–end)	~73kDa	Poly (4:1 Glu, Tyr) peptide	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + c-KIT Kinase Enzyme System	V4499	1 each				
CLK1 Kinase Enzyme System	V4056	10µg	CLK1, 10µg (Human, recombinant; amino acids 129–end)	~66kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CLK1 Kinase Enzyme System	V4057	1 each				
CLK3 Kinase Enzyme System	V4162	10µg	CLK3, 10µg (Human, recombinant full-length)	~86kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + CLK3 Kinase Enzyme System	V4163	1 each				
CSK Kinase Enzyme System	V2981	10µg	CSK, 10µg (Human, recombinant full-length)	~78kDa	Poly (4:1 Glu, Tyr) peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + CSK Kinase Enzyme System	V9251	1 each				
DAPK1 Kinase Enzyme System	V4096	10µg	DAPK1, 10µg (Human, recombinant; amino acids 1–363)	~71kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT, Ca2+/Calmodulin Solution
ADP-Glo™ Kinase Assay + DAPK1 Kinase Enzyme System	V4097	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
DDR2 Kinase Enzyme System	V4058	10µg	DDR2, 10µg (Human, recombinant amino acids 467–end)	~70kDa	Axlitude (CKKSRGDYMTMQIG); derived from mouse insulin receptor substrate 1 (amino acids 979-989)	Reaction Buffer, DTT, MnCl2
ADP-Glo™ Kinase Assay + DDR2 Kinase Enzyme System	V4059	1 each				
DYRK2 Kinase Enzyme System	V5090	10µg	DYRK2, 10µg (Human, recombinant, full-length)	~95kDa	DYRKtide (RRRFRPASPLRGPPK)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + DYRK2 Kinase Enzyme System	V5091	1 each				
DNA-PK Kinase Enzyme System	V4106	2,500 units	DNA-PK, 2,500 units (Human, native full-length)	~460kDa (catalytic subunit) ~85kDa (Ku subunit 1) ~70kDa (Ku subunit 2)	DNA-Dependent Protein Kinase Peptide Substrate (EPPLSQEAFADLWKK)	Reaction Buffer, DNA-PK Activation Buffer, DTT
ADP-Glo™ Kinase Assay + DNA-PK Kinase Enzyme System	V4107	1 each				
EGFR Kinase Enzyme System	V3831	10µg	EGFR, 10µg (Human, recombinant; amino acids 695–end)	~89kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + EGFR Kinase Enzyme System	V9261	1 each				
EGFR (L858R) Kinase Enzyme System	V5322	10µg	EGFR (L858R), 10µg (Human, recombinant; amino acids 695–end)	~89kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + EGFR (L858R) Kinase Enzyme System	V5323	1 each				
EGFR (L861Q) Kinase Enzyme System	V4102	10µg	EGFR (L861Q), 10µg (Human, recombinant; amino acids 695–end)	~89kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + EGFR (L861Q) Kinase Enzyme System	V4103	1 each				
EGFR (T790M) Kinase Enzyme System	V4506	10µg	EGFR (T790M), 10µg (Human, recombinant; amino acids 695–end)	~89kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + EGFR (T790M) Kinase Enzyme System	V4507	1 each				
EGFR (T790M, L858R) Kinase Enzyme System	V5324	10µg	EGFR (T790M, L858R), 10µg (Human, recombinant; amino acids 695–end)	~89kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + EGFR (T790M, L858R) Kinase Enzyme System	V5325	1 each				
EIF2AK2 Kinase Enzyme System	V5328	10µg	EIF2AK2, 10µg (Human, recombinant; amino acids 252–end)	~64kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™Kinase Assay + EIF2AK2 Kinase Enzyme System	V5329	1 each				
EPHA1 Kinase Enzyme System	V3561	10µg	EPHA1, 10µg (Human, recombinant; amino acids 569–end)	~71kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + EPHA1 Kinase Enzyme System	V9271	1 each				
ERK1 Kinase Enzyme System	V1951	10µg	ERK1, 10µg (Human, recombinant full-length)	~44kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ERK1 Kinase Enzyme System	V9281	1 each				
ERK2 Kinase Enzyme System	V1961	10µg	ERK2, 10µg (Human, recombinant full-length)	~68kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ERK2 Kinase Enzyme System	V9291	1 each				
FAK Kinase Enzyme System	V1971	10µg	FAK, 10µg (Human, recombinant; amino acids 393–698)	~35kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + FAK Kinase Enzyme System	V9301	1 each				
FES Kinase Enzyme System	V1981	10µg	FES, 10µg (Human, recombinant full-length)	~125kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + FES Kinase Enzyme System	V9311	1 each				
FGFR1 Kinase Enzyme System	V2991	10µg	FGFR1, 10µg (Human, recombinant; amino acids 399–822)	~73kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer; DTT
ADP-Glo™ Kinase Assay + FGFR1 Kinase Enzyme System	V9321	1 each				
FGFR2 Kinase Enzyme System	V4060	10µg	FGFR2, 10µg (Human, recombinant; amino acids 285–end)	~72kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + FGFR2 Kinase Enzyme System	V4061	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Available in the Helix® on-site stocking system

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
FGFR3 (K650E) Kinase Enzyme System	V5082	10µg	FGFR3 (K650E), 10µg (Human recombinant, amino acids 397–end)	~73kDa	Poly (Ala_6, Glu_2, Lys_5, Tyr_1) (AAAAAAEEK-KKKKY)	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + FGFR3 (K650E) Kinase Enzyme System	V5083	1 each				
FGFR4 Kinase Enzyme System	V4062	10µg	FGFR4, 10µg (Human, recombinant, amino acids 460–end)	~65kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Bffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + FGFR4 Kinase Enzyme System	V4063	1 each				
FLT1 Kinase Enzyme System	V3001	10µg	FLT1, 10µg (Human, recombinant; amino acids 784-end)	~94kDa	IGF1Rtide (KKKSPGEYVNIEFG); derived from human IRS-1 protein residues 891-902	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + FLT1 Kinase Enzyme System	V9331	1 each				
FLT3 Kinase Enzyme System	V4064	10µg	FLT3, 10µg (Human, recombinant, amino acids 571–993)	~73kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + FLT3 Kinase Enzyme System	V4065	1 each				
FLT3 (D835Y) Kinase Enzyme System	V4514	10µg	FLT3 (D835Y), 10µg (Human, recombinant, amino acids 571–993)	~73kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + FLT3 (D835Y) Kinase Enzyme System	V4515	1 each				
FMS Kinase Enzyme System	V4022	10µg	FMS, 10µg (Human, recombinant, amino acids 539–end)	~76kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + FMS Kinase Enzyme System	V4023	1 each				
FYN A Kinase Enzyme System	V3571	10µg	FYN A, 10µg (Human, recombinant full-length)	~85kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + FYN A Kinase Enzyme System	V9341	1 each				
GRK5 Kinase Enzyme System	V3981	10µg	GRK5, 10µg (Human, recombinant full-length)	~95kDa	Native Casein Protein; purified from bovine milk	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + GRK5 Kinase Enzyme System	V9351	1 each				
GSK3α Kinase Enzyme System	V3051	10µg	GSK3α, 10µg (Human, recombinant full-length)	~81kDa	GSK3 Substrate (YRRAAVPPSPSLSRHS-SPHQ(pS)EDEEE); derived from human muscle glycogen synthase 1 (amino acids 636-661)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + GSK3α Kinase Enzyme System	V9361	1 each				
GSK3β Kinase Enzyme System	V1991	10µg	GSK3β, 10µg (Human, recombinant full-length)	~73kDa	GSK3 Substrate (YRRAAVPPSPSLSRHS-SPHQ(pS)EDEEE); derived from human muscle glycogen synthase 1 (amino acids 636-661)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + GSK3β Kinase Enzyme System	V9371	1 each				
HER2 Kinase Enzyme System	V3891	10µg	HER2, 10µg (Human, recombinant; amino acids 676-end)	~116kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + HER2 Kinase Enzyme System	V9381	1 each				
HER4 Kinase Enzyme System	V3101	10µg	HER4, 10µg (Human, recombinant; amino acids 682-993)	~57kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + HER4 Kinase Enzyme System	V9391	1 each				
HIPK1 Kinase Enzyme System	V4066	10µg	HIPK1, 10µg (Human, recombinant, amino acids 156–555)	~71kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + HIPK1 Kinase Enzyme System	V4067	1 each				
HIPK3 Kinase Enzyme System	V4164	10µg	HIPK3, 10µg (Human, recombinant, amino acids 163–562)	~49kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + HIPK3 Kinase Enzyme System	V4165	1 each				
HPK1 Kinase Enzyme System	V4098	10µg	HPK1, 10µg (Human, recombinant, amino acids 1–346)	~65kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + HPK1 Kinase Assay System	V4099	1 each				
IGF1R Kinase Enzyme System	V3581	10µg	IGF1R, 10µg (Human, recombinant; amino acids 960-end)	~53kDa	IGF1Rtide (KKKSPGEYVNIEFG); derived from human IRS-1 protein residues 891-902	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + IGF1R Kinase Enzyme System	V9401	1 each				
IKKα Kinase Enzyme System	V4068	10µg	IKKα, 10µg (Human, recombinant full-length)	~114kDa	IKKtide (KKKKERLLDDRHDSG-LDSMK-DEE); derived from human IkBA (amino acids 21–41)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + IKKα Kinase Enzyme System	V4069	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
IKKβ Kinase Enzyme System	V4502	10µg	IKKβ, 10µg (Human, recombinant, full-length)	~105kDa	IKKtide (KKKKERLLDDRHDSG-LDSMKDEE); derived from human IkBA (amino acids 21–41)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + IKKβ Kinase Enzyme System	V4503	1 each				
InsR Kinase Enzyme System	V3901	10µg	InsR, 10µg (Human, recombinant; amino acids 1011-end)	~70kDa	Axltide (KKSRGDYMTMQIG); derived from the mouse insulin receptor substrate 1 (amino acids 979-989)	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + InsR Kinase Enzyme System	V9411	1 each				
IRAK4 Kinase Enzyme System	V2621	10µg	IRAK4, 10µg (Human, recombinant full-length)	~81kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + IRAK4 Kinase Enzyme System	V9421	1 each				
ITK Kinase Enzyme System	V3191	10µg	ITK, 10µg (Human, recombinant; amino acids 352–end)	~53kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + ITK Kinase Enzyme System	V9431	1 each				
JAK3 Kinase Enzyme System	V3701	10µg	JAK3, 10µg (Human, recombinant; amino acids 781–end)	~64kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + JAK3 Kinase Enzyme System	V9441	1 each				
JNK1 Kinase Enzyme System	V4070	10µg	JNK1, 10µg (Human, recombinant full-length)	~70kDa	p38 Substrate (IPTTPITTTYFFFKKK)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + JNK1 Kinase Enzyme System	V4071	1 each				
JNK3 Kinase Enzyme System	V3821	10µg	JNK3, 10µg (Human, recombinant full-length)	~71kDa	p38 peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + JNK3 Kinase Enzyme System	V9461	1 each				
KDR Kinase Enzyme System	V2681	10µg	KDR, 10µg (Human, recombinant; amino acids 789–end)	~110kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + KDR Kinase Enzyme System	V9471	1 each				
KHS1 Kinase Enzyme System	V4108	10µg	KHS1, 10µg (Human, recombinant full-length)	~135kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + KHS1 Kinase Enzyme System	V4109	1 each				
LCK Kinase Enzyme System	V2691	10µg	LCK, 10µg (Human, recombinant full-length)	~84 kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + LCK Kinase Enzyme System	V9491	1 each				
LRRK2 Kinase Enzyme System	V4474	10µg	LRRK2, 10µg (Human, recombinant; amino acids 968–end)	~210kDa	LRRKtide (RLGRDKYKTLRQIRQ)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + LRRK2 Kinase Enzyme System	V4475	1 each				
LYN B Kinase Enzyme System	V3711	10µg	LYN B, 10µg (Human, recombinant full-length)	~85kDa	SRC substrate (KVEKIGEGTYGVVYK-amide); derived from human p34cdc2 (amino acids 6-20)	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + LYN B Kinase Enzyme System	V9501	1 each				
MAPKAPK2 Kinase Enzyme System	V4024	10µg	MAPKAPK2, 10µg (Human, recombinant, amino acids 46–end)	~41kDa	HSP27tide (RRLNRQLSVA-amide); derived from the mouse HSP27 (amino acids 80–85)	Reaction Buffer, DTT
ADP-Glo™ Kinase ASsay + MAPK APK2 Kinase Enzyme System	V4025	1 each				
MAPKAPK3 Kinase Enzyme System	V4026	10µg	MAPKAPK3, 10µg (Human, recombinant full-length)	~69kDa	HSP27tide (RRLNRQLSVA-amide); derived from the mouse HSP27 (amino acids 80–85)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MAPK APK3 Kinase Enzyme System	V4027	1 each				
MAPKAPK5 Kinase Enzyme System	V4166	10µg	MAPKAPK5, 10µg (Human, recombinant full-length)	~79kDa	HSP27tide peptide (RRLNRQLSVA-amide); derived from the mouse HSP27 (amino acids 80–85)	Reaction Buffer, DTT
ADP-Glo™ Kinase ASsay + MAPK APK5 Kinase Enzyme System	V4167	1 each				
MARK1 Kinase Enzyme System	V4028	10µg	MARK1, 10µg (Human, recombinant full-length)	~125kDa	Chktide (KKKVSRSGLYRSPSMPENLNRPR); derived from human CDC25C protein isoform A (amino acid 205–225)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MARK1 Kinase Enzyme System	V4029	1 each				
MELK Kinase Enzyme System	V4150	10µg	MELK, 10µg (Human, recombinant, amino acids 1–340)	~61kDa	ZIPtide (KKLNRTLSFAEPG)	Reaction Buffer, DTT
ADP-GLo™ Kinase Assay + MELK Kinase Enzyme System	V4151	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Available in the Helix® on-site stocking system

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
c-MER Kinase Enzyme System	V3541	10µg	c-MER, 10µg (Human, recombinant; amino acids 578–872)	~58kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + c-MER Kinase Enzyme System	V9561	1 each				
MET Kinase Enzyme System	V3361	10µg	MET, 10µg (Human, recombinant; amino acids 956–end)	~81kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MET Kinase Enzyme System	V9571	1 each				
MET (M1250T) Kinase Enzyme System	V4168	10µg	MET (M1250T), 10µg (Human, recominant; amino acids 956–end)	~81kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCL_2$
ADP-Glo™ Kinase ASsay + MET (M1250T) Kinase Enzyme System	V4169	1 each				
MINK1 Kinase Enzyme System	V3911	10µg	MINK1, 10µg (Human, recombinant; amino acids 1–320)	~61kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer; DTT
ADP-Glo™ Kinase Assay + MINK1 Kinase Enzyme System	V8001	1 each				
MLCK Kinase Enzyme System	V4496	10µg	MLCK, 10µg (Human, recombinant; amino acids 1425–1776)	~70kDa	MRCL3 Peptide (KKRPQRATSN-VFAM-NH2); derived from human myosin regulatory light chain MRCL3 (amino acids 11–24)	Reaction Buffer, DTT, CA^{2+}/Calmodulin Solution
ADP-Glo™ Kinase Assay + MLCK Kinase Enzyme System	V4497	1 each				
MLK1 Kinase Enzyme System	V4072	10µg	MLK1, 10µg (Human, recombinant; amino acids 1–433)	~77kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MLK1 Kinase Enzyme System	V4073	1 each				
MLK2 Kinase Enzyme System	V4476	10µg	MLK2, 10µg (Human, recombinant; amino acids 1–446)	~76kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MLK2 Kinase Enzyme System	V4477	1 each				
MRCKα Kinase Enzyme System	V5710	10µg	MRCKα, 10µg (Human, recombinant; amino acids 1–473)	~73kDa	S6K substrate (KRRRLASLR); derived from human 40S ribosomal protein S6 (amino acids 230–238)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MRCKα Kinase Enzyme System	V5711	1 each				
MSK1 Kinase Enzyme System	V5092	10µg	MSK1, 10µg (Human, recombinant full-length)	~120kDa	RSK Substrate (KRRRLSSLRA); derived from human 40S ribosomal protein S6 (amino acids 230–239)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MSK1 Kinase Enzyme System	V5093	1 each				
MSK2 Kinase Enzyme System	V5080	10µg	MSK2, 10µg (Human, recombinant full-length)	~114kDa	RSK Substrate (KRRRLSSLRA); derived from human 40S ribosomal protein S6 (amino acids 230–239)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MSK2 Kinase Enzyme System	V5081	1 each				
MST1 Kinase Enzyme System	V4152	10µg	MST1, 10µg (Human, recombinant full-length)	~83kDa	Axltide (KKSRGDYMTMQIG); derived from mouse Insulin receptor substrate 1 (amino acids 979–989)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MST1 Kinase Enzyme System	V4153	1 each				
MYO3β Kinase Enzyme System	V4074	10µg	MYO3β , 10µg (Human, recombinant; amino acids 1–326)	~63kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + MYO3β Kinase Enzyme System	V4075	1 each				
NEK2 Kinase Enzyme System	V3871	10µg	NEK2, 10µg (Human, recombinant full-length)	~76kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + NEK2 Kinase Enzyme System	V9231	1 each				
NEK3 Kinase Enzyme System	V4500	10µg	NEK3, 10µg (Human, recombinant full-length)	~86kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + NEK3 Kinase Enzyme System	V4501	1 each				
NIK Kinase Enzyme System	V4076	10µg	NIK, 10µg (Human, recombinant; amino acids 325–end)	~108kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + NIK Kinase Enzyme System	V4077	1 each				
NUAK2 Kinase Enzyme System	V5096	10µg	NUAK2, 10µg (Human, recombinant full-length)	~110kDa	CHKtide (KKKVSRSGLYRSPSMPENLNRPR); derived from human CDC25C protein isoform A (amino acids 205–225)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + NUAK2 Kinase Enzyme System	V5097	1 each				
p38α Kinase Enzyme System	V2701	10µg	p38α, 10µg (Human, recombinant full-length)	~67kDa	p38 peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + p38α Kinase Enzyme System	V9591	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
p38β Kinase Enzyme System	V4154	10µg	p38β, 10µg (Human, recombinant full-length)	~71kDa	p38 Substrate (IPTTPITTTYFFFKKK)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + p38β Kinase Enzyme System	V4155	1 each				
p38δ Kinase Enzyme System	V4078	10µg	p38δ, 10µg (Human, recombinant full-length)	~71kDa	p38 Substrate (IPTTPITTTYFFFKKK)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + p38δ Kinase Enzyme System	V4079	1 each				
p38γ Kinase Enzyme System	V3371	10µg	p38γ, 10µg (Human, recombinant full-length)	~71kDa	p38 peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + p38γ Kinase Enzyme System	V9601	1 each				
p70S6K Kinase Enzyme System	V2741	10µg	p70S6K, 10µg (Human, recombinant full-length)	~76 kDa	S6K substrate (KRRRLASLR); derived from human 40S ribosomal protein S6 (amino acids 230-238)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + p70S6K Kinase Enzyme System	V9611	1 each				
p70S6Kb Kinase Enzyme System	V4030	10µg	p70S6Kb, 10µg (Human, recombinant full-length)	~85kDa	RSK Substrate (KRRRLSSLRA); derived from human 40S ribosomal protein S6 (amino acids 230–239)	Kinase Assay Buffer I, DTT
ADP-Glo™ Kinase Assay + p70S6Kb Kinase Enzyme System	V4031	1 each				
PAK1/CDC42 Kinase Enzyme System	V4478	10µg	PAK1/CDC42, 10µg (Human, recombinant full-length)	~96kDa (PAK1)	PAKtide (RRRLSFAEPG)	Reaction Buffer, DTT, GTP Solution
ADP-Glo™ Kinase Assay + PAK1/CDC42 Kinase Enzyme System	V4479	1 each				
PAK3 Kinase Enzyme System	V4080	10µg	PAK3, 10µg (Mouse, recombinant full-length)	~89kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PAK3 Kinase Enzyme System	V4081	1 each				
PAK4 Kinase Enzyme System	V3201	10µg	PAK4, 10µg (Human, recombinant full-length)	~90kDa	Modified AKT Substrate II peptide (modified-CKRPRAASFAE); based on the N-terminus of GSK3	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PAK4 Kinase Enzyme System	V9451	1 each				
PASK Kinase Enzyme	V4240	10µg	PASK, 10µg (Human recombinant; amino acids 981–end)	~66kDa	ZIPtide (KKLNRTLSAEPG)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PASK Kinase Enzyme System	V4241	1 each				
PDGFRα Kinase Enzyme System	V3721	10µg	PDGFRα, 10µg (Human, recombinant; amino acids 550–end)	~95kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PDGFRα Kinase Enzyme System	V8011	1 each				
PDGFRα (D842V) Kinase Enzyme System	V4480	10µg	PDGFRα (D842V), 10µg (Human, recombinant; amino acids 550–end)	~95kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + PDGFRα (D842V) Kinase Enzyme System	V4481	1 each				
PDGFRα (T6741) Kinase Enzyme System	V4486	10µg	PDGFRα (D842V), 10µg (Human, recombinant; amino acids 550–end)	~95kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + PDGFRα (T6741) Kinase Enzyme System	V4487	1 each				
PDGFRβ Kinase Enzyme System	V3731	10µg	PDGFRβ, 10µg (Human, recombinant; amino acids 557–end)	~104kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PDGFRβ Kinase Enzyme System	V8021	1 each				
PDK1 Kinase Enzyme System	V2761	10µg	PDK1, 10µg (Human, recombinant full-length)	~67 kDa	PDKtide (KTFCGTPEYLAPEVRREPRILSEE-EQEMFRDFDYIADWC); derived from two human proteins: residues 1–14 are based on AKT1 (307–320) and residues 16–39 are based on PKN2/PRK2 (961–984)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PDK1 Kinase Enzyme System	V9681	1 each				
PIM1 Kinase Enzyme System	V4032	10µg	PIM1, 10µg (Human, recombinant full-length)	~62kDa	S6K Substrate (KRRRLASLR); derived from human 40S ribosomal protein S6 (amino acids 230–238)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PIM1 Kinase Enzyme System	V4033	1 each				
PIM2 Kinase Enzyme System	V4034	10µg	PIM2, 10µg (Human, recombinant full-length)	~61kDa	S6K Substrate (KRRRLASLR); derived from human 40S ribosomal protein S6 (amino aicd 230–238)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PIM2 Kinase Enzyme System	V4035	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Available in the Helix® on-site stocking system

Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
PKA Kinase Enzyme System	V4246	2,500 units	PKA, 2,500 units (Bovine, recombinant full-length)	~40kDa	Kemptide (LRRASLG)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PKA Kinase Enzyme System	V4247	1 each				
PKC Kinase Enzyme System	V4504	0.5µg	PKC, 0.5µg (rat brain, native full-length)	various (contains α, β and γ isoforms with lesser amounts of δ and ζ isoforms)	Neurogranin$_{(28–43)}$ (PKC) Peptide Substrate (AAKIQASFRGHMARKK)	PKC Activation 5X Buffer, PKC Coactivation Buffer
ADP-Glo™ Kinase Assay + PKC Kinase Enzyme System	V4505	1 each				
PKCα Kinase Enzyme System	V3381	10µg	PKCα, 10µg (Human, recombinant full-length)	~103kDa	CREBtide (KRREILSRRPSYR); derived from human CREB1 isoform A (amino acids 109-121)	Reaction Buffer, DTT, Lipid Solution
ADP-Glo™ Kinase Assay + PKCα Kinase Enzyme System	V9691	1 each				
PKCβI Kinase Enzyme System	V5094	10µg	PKCβI, 10µg (Human, recombinant full-length)	~102kDa	PCKtide (ERMRPRKRQGSVRRRV); derived from protein kinase C epsilon (amino acids 149–164)	Reaction Buffer, DTT, Lipid Activator Solution
ADP-Glo™ Kinase Assay + PKCβ1 Kinase Enzyme System	V5095	1 each				
PKCβ II Kinase Enzyme System	V3741	10µg	PKCβ II, 10µg (Human, recombinant full-length)	~105kDa	CREBtide (KRREILSRRPSYR); derived from human CREB1 isoform A (amino acids 109-121)	Reaction Buffer, DTT, Lipid solution
ADP-Glo™ Kinase Assay + PKCβ II Kinase Enzyme System	V9701	1 each				
PKCγ Kinase Enzyme System	V3391	10µg	PKCγ, 10µg (Human, recombinant full-length)	~105kDa	PKCtide (ERMRPRKRQGSVRRRV); derived from protein kinase C epsilon (amino acids 149-164)	Reaction Buffer, DTT, Lipid solution
ADP-Glo™ Kinase Assay + PKCγ Kinase Enzyme System	V9711	1 each				
PKCδ Kinase Enzyme System	V3401	10µg	PKCδ, 10µg (Human, recombinant full-length)	~104kDa	CREBtide (KRREILSRRPSYR); derived from human CREB1 isoform A (amino acids 109-121)	Reaction Buffer, DTT, Lipid solution
ADP-Glo™ Kinase Assay + PKCδ Kinase Enzyme System	V9721	1 each				
PKCζ Kinase Enzyme System	V2781	10µg	PKCζ, 10µg (Human, recombinant full-length)	~93kDa	CREBtide (KRREILSRRPSYR); derived from human CREB1 isoform A (amino acids 109-121)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PKCζ Kinase Enzyme System	V9731	1 each				
PKCι Kinase Enzyme System	V3751	10µg	PKCι, 10µg (Human, recombinant full-length)	~98kDa	CREBtide (KRREILSRRPSYR); derived from human CREB1 isoform A (amino acids 109-121)	Reaction Buffer, DTT, Lipid solution
ADP-Glo™ Kinase Assay + PKCι Kinase Enzyme System	V9751	1 each				
PKCε Kinase Enzyme System	V4036	10µg	PKCε, 10µg (Human, recombinant full-length)	~110kDa	PKCtide (ERMRPRKRQGSVRRRV); derived from protein kinase C epsilon (amino acids 149–164)	Reaction Buffer, DTT, Lipid Solution
ADP-Glo™ Kinase Assay + PKCε Kinase Enzyme System	V4037	1 each				
PKCμ Kinase Enzyme System	V4038	10µg	PKCμ, 10µg (Human, recombinant full-length)	~131kDa	CREBtide (KRREILSRRPSYR); derived from human CREB1 isoform A (amino acids 109–121)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PKCμ Kinase Enzyme System	V4039	1 each				
PKCθ Kinase Enzyme System	V4040	10µg	PKCθ, 10µg (Human, recombinant full-length)	~110kDa	PKCtide (ERMRPRKRQGSVRRRV); derived from protein kinase C epsilon (amino acids 149–164)	Reaction Buffer, DTT, Lipid Solution
ADP-Glo™ Kinase Assay + PKCθ Kinase Enzyme System	V4041	1 each				
PKD2 Kinase Enzyme System	V4042	10µg	PKD2, 10µg (Human, recombinant full-length)	~130kDa	CREBtide (KRREILSRRPSYR); derived from human CREB1 isoform A (amino acids 109–121)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + PDK2 Kinase Enzyme System	V4043	1 each				
PLK1 Kinase Enzyme System	V2841	10µg	PLK1, 10µg (Human, recombinant full-length)	~70kDa	Casein, Dephosphorylated (Bovine)	Reaction Buffer; DTT
ADP-Glo™ Kinase Assay + PLK1 Kinase Enzyme System	V8041	1 each				
PYK2 Kinase Enzyme System	V4082	10µg	PYK2, 10µg (Human, recombinant; amino acids 360–690)	~39kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + PYK2 Kinase Enzyme System	V4083	1 each				
RET Kinase Enzyme System	V3761	10µg	RET, 10µg (Human, recombinant; amino acids 658–end)	~74kDa	IGF1Rtide (KKKSPGEYVNIEFG); derived from human IRS-1 protein residues 891–902	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + RET Kinase Enzyme System	V8061	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

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Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
RET (V804L) Kinase Enzyme System	V4472	10µg	RET (V804L), 10µg (Human, recombinant; amino acids 658–end)	~74kDa	IGF1Rtide (KKKSPGEYVNIEFG); derived from human IRS-1 protein residues 892–902	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + RET (V804L) Kinase Enzyme System	V4473	1 each				
RET (Y791F) Kinase Enzyme System	V5326	10µg	RET (Y791F), 10µg (Human, recombinant; amino acids 658–end)	~74kDa	IGF1Rtide (KKKSPGEYVNIEFG); derived from human IRS-1 protein residues 891–902	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + RET (Y791F) Kinase Enzyme System	V5327	1 each				
RIPK2 Kinase Enzyme System	V4084	10µg	RIPK2, 10µg (Human, recombinant; amino acids 1–299)	~59kDa	Native Swine Myelin Basic Protien (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + RIPK2 Kinase Enzyme System	V4085	1 each				
ROCK1 Kinase Enzyme System	V3411	10µg	ROCK1, 10µg (Human, recombinant; amino acids 17–535)	~85kDa	S6K substrate (KRRRLASLR); derived from human 40S ribosomal protein S6 (amino acids 230–238)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ROCK1 Kinase Enzyme System	V9581	1 each				
ROCK2 Kinase Enzyme System	V4044	10µg	ROCK2, 10µg (Human, recombinant; amino acids 5–554)	~88kDa	S6K Substrate (KRRRLASLR); derived from human 40S ribosomal protein S6 (amino acids 230–238)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ROCK2 Kinase Enzyme System	V4045	1 each				
RON Kinase Enzyme System	V3921	10µg	RON, 10µg (Human, recombinant; amino acids 983–end)	~71kDa	Axltide (KKSRGDYMTMQIG); derived from the mouse Insulin receptor substrate 1 (amino acids 979–989)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + RON Kinase Enzyme System	V8071	1 each				
RSK1 Kinase Enzyme System	V4046	10µg	RSK1, 10µg (Human, recombinant full-length)	~108kDa	S6K Substrate (KRRRLASLR); derived from human 40S ribosomal protein S6 (amino acids 230–238)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + RSK1 Kinase Enzyme System	V4047	1 each				
RSK2 Kinase Enzyme System	V3501	10µg	RSK2, 10µg (Human, recombinant full-length)	~112kDa	RSK Substrate (KRRRLSSLRA); derived from human 40S ribosomal protein S6 (amino acids 230–239)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + RSK2 Kinase Enzyme System	V9651	1 each				
SGK1 Kinase Enzyme System	V2911	10µg	SGK1, 10µg (Human, recombinant; amino acids 1–303)	~73kDa	Akt (PKB) substrate (CKRPRAASFAE)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + SGK1 Kinase Enzyme System	V9671	1 each				
SIK Kinase Enzyme System	V4156	10µg	SIK, 10µg (Human, recombinant; amino acids 60–end)	~36kDa	AMARA Peptide (AMARAASAAALARRR)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + SIK Kinase Enzyme System	V4157	1 each				
SLK Kinase Enzyme System	V4242	10µg	SLK, 10µg (Human, recombinant full-length)	~180kDa	Native Histone H3 Protein; purified from calf thymus tissues	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + SLK Kinase Enzyme System	V4243	1 each				
SRC Kinase Enzyme System	V2921	10µg	SRC, 10µg (Human, recombinant full-length)	~83kDa	SRC substrate (KVEKIGEGTYGVVYK-amide); derived from human p34cdc2 (amino acids 6-20)	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + SRC Kinase Enzyme System	V9741	1 each				
STK33 Kinase Enzyme System	V4086	10µg	STK33, 10µg (Human, recombinant full-length)	~94kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + STK33 Kinase Enzyme System	V4087	1 each				
SYK Kinase Enzyme System	V3801	10µg	SYK, 10µg (Human, recombinant full-length)	~100kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer; DTT
ADP-Glo™ Kinase Assay + SYK Kinase Enzyme System	V8271	1 each				
TAK1-TAB1 Kinase Enzyme System	V4088	10µg	TAK1-TAB1, 10µg (Human, recombinant; TAK1 (1–303) and TAB1 (437–end))	~74kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + TAK1-TAB1 Kinase Enzyme System	V4089	1 each				
TAOK1 Kinase Enzyme System	V4090	10µg	TAOK1, 10µg (Human, recombinant; amino acids 1–314)	~63kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + TAOK1 Kinase Enzyme System	V4091	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

9526LJ

Available in the Helix® on-site stocking system

Kinase Enzyme Systems-continued

Product	Cat.#	Size	Kinase	Molecular Weight	Substrate	Other
TBK1 Kinase Enzyme System	V3991	10µg	TBK1, 10µg (Human, recombinant full-length)	~105kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + TBK1 Kinase Enzyme System	V8291	1 each				
TGFβR1 Kinase Enzyme System	V4092	10µg	TGFβR1, 10µg (Human, recombinant; amino acids 80–end)	~66kDa	TGFBR1 Peptide (KKKVLTQMGSPSIRC-S(pS)VS); derived from human SMAD3 (215–230)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + TGFβR1 Kinase Enzyme System	V4093	1 each				
TGFβR2 Kinase Enzyme System	V3931	10µg	TGFβR2, 10µg (Human, recombinant full-length)	~68kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + TGFβR2 Kinase Enzyme System	V8301	1 each				
TNIK Kinase Enzyme System	V4158	10µg	TNIK, 10µg (Human, recombinant; amino acids 1–367)	~67kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + TNIK Kinase Enzyme System	V4159	1 each				
TOPK Kinase Enzyme System	V4094	10µg	TOPK, 10µg (Human, recombinant full-length)	~68kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + TOPK Kinase Enzyme System	V4095	1 each				
TRKA Kinase Enzyme System	V2931	10µg	TRKA, 10µg (Human, recombinant; amino acids 440–end)	~66kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + TRKA Kinase Enzyme System	V9761	1 each				
TRKB Kinase Enzyme System	V4048	10µg	TRKB, 10µg (Human, recombinant; amino acids 455–end)	~67kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + TRKB Kinase Enzyme System	V4049	1 each				
ULK1 Kinase Enzyme System	V3521	10µg	ULK1, 10µg (Human, recombinant; amino acids 1–649)	~125kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ULK1 Kinase Enzyme System	V9191	1 each				
VRK2 Kinase Enzyme System	V4494	10µg	VRK2, 10µg (Human, recombinant; amino acids 1–375)	~66kDa	Native Casein Protein was purified from bovine milk	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + VRK2 Kinase Enzyme System	V4495	1 each				
WNK1 Kinase Enzyme System	V5084	10µg	WNK1, 10µg (Human recombinant; amino acids 181–507)	~67kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, $MnCl_2$, DTT
ADP-Glo™ Kinase Assay + WNK1 Kinase Enzyme System	V5085	1 each				
ZAK Kinase Enzyme System	V4244	10µg	ZAK, 10µg (Human recombinant full-length)	~82kDa	Native Swine Myelin Basic Protein (MBP)	Reaction Buffer, DTT
ADP-Glo™ Kinase Assay + ZAK Kinase Enzyme System	V4245	1 each				
ZAP70 Kinase Enzyme System	V3811	10µg	ZAP70, 10µg (Human, recombinant full-length)	~96kDa	Poly (4:1 Glu, Tyr) Peptide	Reaction Buffer, DTT, $MnCl_2$
ADP-Glo™ Kinase Assay + ZAP70 Kinase Enzyme System	V8311	1 each				

Note: 1mg sizes of each Kinase Enzyme System are available upon request.

9526LK

Kinase-Glo® Luminescent Kinase Assays

Product	Size	Cat.#
Kinase-Glo® Luminescent Kinase Assay	10 ml	V6711
	10 × 10 ml	V6712
	100 ml	V6713
	10 × 100 ml	V6714
Kinase-Glo® Max Luminescent Kinase Assay	10 ml	V6071
	10 × 10 ml	V6072
	100 ml	V6073
	10 × 100 ml	V6074
Kinase-Glo® Plus Luminescent Kinase Assay	10 ml	V3771
	10 × 10 ml	V3772
	100 ml	V3773
	10 × 100 ml	V3774

For Research Use Only. Not for Use in Diagnostic Procedures.

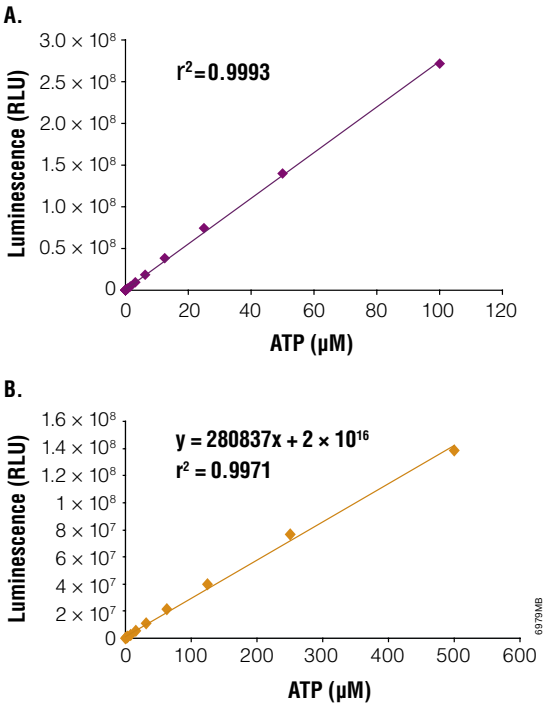
Description: The Kinase-Glo® Luminescent Kinase Assays are homogeneous non-radioactive methods for determining the activity of purified kinases by quantifying the amount of ATP remaining in solution following a kinase reaction. The assays are designed for use with multiwell plate formats, making them ideal for automated high-throughput screening (HTS), and they can be used to assay protein, lipid and sugar kinases. The assay procedure involves adding a single reagent directly to a completed kinase reaction, which results in generation of a luminescent signal correlated with the amount of ATP present and inversely proportional to the amount of kinase activity. The Kinase-Glo® Assays generate a "glow-type" luminescent signal produced using a patented stabilized luciferase (Ultra-Glo™ Luciferase) coupled with a proprietary buffer system. When assayed in the presence of kinase reaction buffers, such as the reaction buffer for PKA, the half-life of the luminescent output is greater than five hours, eliminating the need for luminometers with injectors and allowing for batch plate processing. The assay produces excellent Z′ values of greater than 0.7 in 96- and 384-well formats, easily detects known kinase inhibitors and provides IC_{50} values comparable to those reported in the literature.

The Kinase-Glo® Assay systems are differentiated by their linear response to ATP (see figure below). The original Kinase-Glo® Assay is linear to 10µM ATP, while Kinase-Glo® Plus Assay is linear to 100µM ATP. The newest assay, Kinase-Glo® Max, is linear to 500µM ATP, making it well suited for use with kinases with high K_m for ATP as well as for screening for kinase inhibitors that do not compete at the ATP binding site.

Features:

- **Assay a Variety of Kinases:** Use with a wide range of kinases (including lipid, sugar and alcohol kinases) and substrates (peptides, proteins, lipids, sugars and alcohols).
- **Obtain Reliable Results:** Luminescence is much less susceptible to interference from library compounds than other luciferase-based ATP detection reagents. Z′-factors greater than 0.7 in either 96- or 384-well plate formats.
- **Simplify Your Assay:** Homogeneous—everything is performed in a single well.
- **Non-Radioactive:** No radioactive waste disposal and safety issues.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**
- **Screen for Non-ATP Binding Site Inhibitors:** Use ATP concentrations as high as 500µM (Kinase-Glo® Max Assay).

Storage Conditions: Store at –20°C. Avoid multiple freeze-thaw cycles and exposure to frequent temperature changes. These fluctuations can greatly alter product stability.



Luminescent output correlates with amount of ATP. A direct relationship exists between luminescence measured with the Kinase-Glo® Assay systems and the amount of ATP in the reaction. **Panel A.** Data generated with Kinase-Glo® Plus Assay. **Panel B.** Data generated with Kinase-Glo® Max Assay. The Kinase-Glo® Assay is linear to 10µM (data not shown).

ProFluor® PKA Assay

Product	Size	Cat.#
ProFluor® PKA Assay	4 plate	V1240
	8 plate	V1241

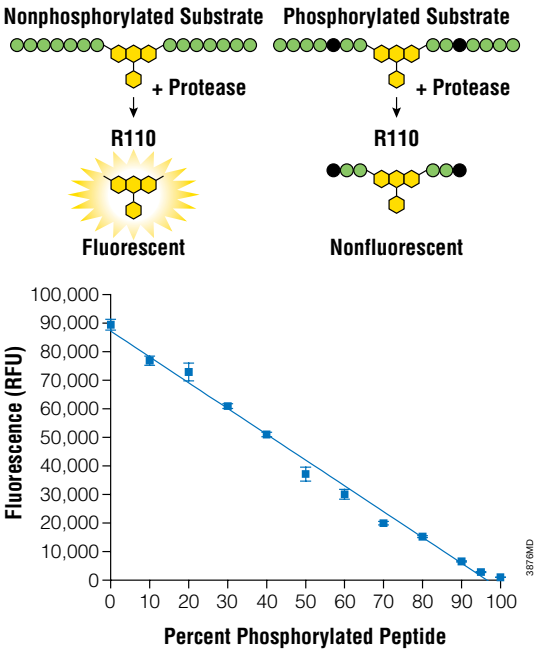
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ProFluor® PKA Assay measures protein kinase A activity using purified kinase in a multiwell plate format and involves "add-mix-read" steps only—ideal for high-throughput applications. The assay begins with a standard kinase reaction performed with a provided PKA bisamide rhodamine 110 peptide substrate. Following the kinase reaction, a termination buffer containing a protease reagent is added, which simultaneously stops the kinase reaction and removes amino acids specifically from the nonphosphorylated PKA substrate, liberating highly fluorescent rhodamine 110. Phosphorylated PKA substrate, however, is resistant to digestion by the protease reagent and remains nonfluorescent. Thus, fluorescence intensity measured in this assay is inversely correlated with kinase activity. The assay produces excellent Z′-factor values (>0.8) in either 96- or 384-well plate formats and easily distinguishes known PKA inhibitors from other compounds.

Features:

- **Achieve Highly Predictive Results:** Robust Z′ values greater than 0.7 in either 96- or 384-well plate formats.
- **Observe Minimal Test Compound Interference:** Rhodamine 110 fluorescent signal produced is much higher than the fluorescent signal given off by test compounds.
- **Homogeneous:** Add-mix-read format reduces the number of steps.
- **Non-Radioactive:** No radioactive waste disposal and safety issues.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the entire system at –20°C. Protect the PKA R110 Substrate from light. For best results, make solutions fresh and use immediately. System components should be thawed on ice and returned to –20°C as soon as possible. The PKA R110 Substrate is provided in 100% DMSO and therefore requires thawing at room temperature.



Schematic and graph demonstrating that the presence of a phosphorylated amino acid (black circles) blocks the removal of amino acids from the PKA peptide substrate by the protease.

ProFluor® Src-Family Kinase Assay

Product	Size	Cat.#
ProFluor® Src-Family Kinase Assay	4 plate	V1270
	8 plate	V1271

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ProFluor® Src-Family Kinase Assay measures the activity of purified Src-family tyrosine kinases (Src, Lck, Lyn, Fyn, and Hck tested) in a multiwell plate format and involves "add-mix-read" steps only—ideal for high-throughput applications. The assay begins with a standard kinase reaction performed with a provided Src-family kinase bisamide rhodamine 110 peptide substrate. Following the kinase reaction, a termination buffer containing a protease reagent is added, which simultaneously stops the kinase reaction and removes amino acids specifically from the nonphosphorylated substrate, liberating highly fluorescent rhodamine 110. Phosphorylated substrate, however, is resistant to digestion by the protease reagent and remains nonfluorescent. Thus, fluorescence intensity measured in this assay is inversely correlated with kinase activity. A control peptide (AAF-AMC) is included to control for compounds that may inhibit the protease. The assay produces excellent Z′ values (>0.7) in either 96- or 384-well plate formats and easily distinguishes known Src-family kinase inhibitors from other compounds.

Features:

- **Achieve Highly Predictive Results:** Robust Z′ values greater than 0.7 in either 96- or 384-well plate formats.
- **Observe Minimal Test Compound Interference:** Rhodamine 110 fluorescent signal produced is much higher than the fluorescent signal given off by test compounds.
- **Control Peptide Included:** Use AAF-AMC control peptide to monitor protease activity and reduce false-positive hits.
- **Homogeneous:** Add-mix-read format reduces the number of plate-handling steps.
- **Non-Radioactive:** No radioactive waste disposal and safety issues.

Storage Conditions: For long-term storage, store the system at –20°C. Protect the Src-Family Kinase R110 Substrate and Control AMC Substrate from light. Avoid multiple freeze-thaw cycles or exposure to frequent temperature changes. These fluctuations can greatly alter product stability.

SAM²® Biotin Capture Membrane

Product	Size	Cat.#
SAM²® Biotin Capture Membrane	96 samples	V2861
	7.6 × 10.9 cm	V7861

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SAM²® Biotin Capture Membrane binds biotinylated molecules based on their affinity for streptavidin. The proprietary process by which the SAM²® Membrane is produced results in a high density of streptavidin on the filter, providing rapid, quantitative substrate binding in the nmol/cm² range, depending upon the substrate used. In addition, the membrane is designed to minimize nonspecific binding. The membrane is available either as a large, prenumbered, partially cut sheet (approximately 10.5 × 15.0cm; Cat.# V2861) or as a smaller, uncut sheet (approximately 7.6 × 10.9cm; Cat.# V7861). The partially cut membrane allows easy separation into 96 individual squares and is designed for small-scale experiments where high binding capacity is required. The uncut sheet can be analyzed as a whole membrane or may be cut to the size desired. The uncut membrane allows for sample application using a multichannel pipettor. Both membranes may be analyzed using phosphorimaging analysis, autoradiography or scintillation counting to quantitate results. The membranes have also been used successfully with chemiluminescence detection techniques. The use of fluorescence for detection of captured molecules is not recommended at this time.

Features:

- **Use a Variety of Substrates:** Analysis of biotinylated substrates can be applied to a wide variety of substrate types without the need to optimize each substrate for binding to a matrix. The user can perform experiments with a wide array of sample numbers and sizes without changing the analysis technique, since the membrane is available in 96-square (partially cut) and solid sheet (uncut) formats.
- **Minimize Nonspecific Binding:** The combination of protein denaturant and high-salt washes minimizes nonspecific binding to the membrane without interfering with the high-affinity interaction between streptavidin and biotin.
- **Obtain High Signal-to-Noise Ratios:** The stringent washing conditions employed assist in attaining very low background counts.
- **Perform Kinetic Studies:** Membrane can linearly bind biotinylated substrates up to the nmol/cm² range. Allows for kinetic studies.
- **Strong Binding Reaction:** Membrane retains the biotin conjugate over 8 logs of pH (pH 2–10), changes in temperature, organic solvents, ionic and nonionic detergents (SDS, CHAPS, Triton® X-100, Tween® 20 and Tween® 80) and denaturing agents (5M guanidine-HCl and 2M urea).
- **Rapid:** Binds within 1 minute.
- **Convenient:** Compatible with enzyme assays using radioactive detection. Membranes manufactured by this method have been shown to allow chemiluminescent detection.

Storage Conditions: Store membranes at –20°C in resealable bag.

SignaTECT® Protein Kinase Assay Systems

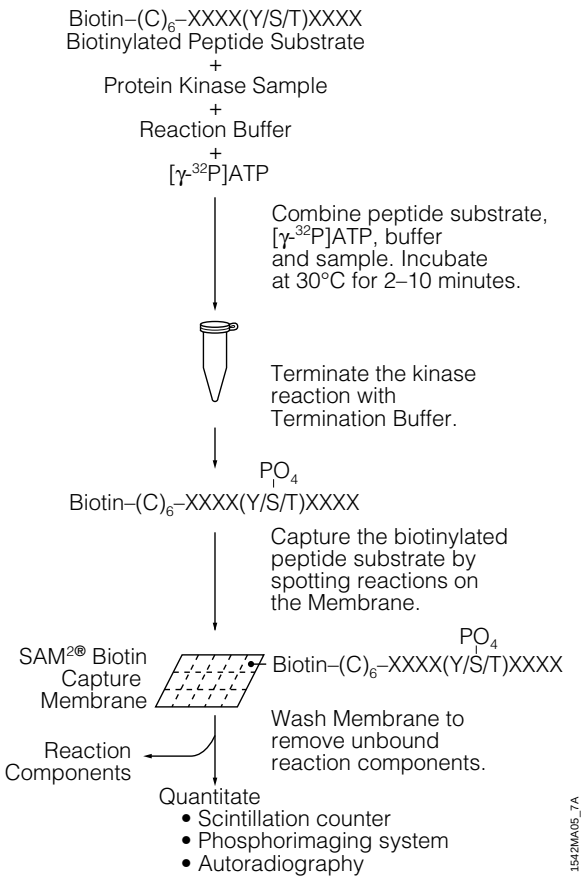
Product	Size	Cat.#
SignaTECT® cAMP-Dependent Protein Kinase (PKA) Assay System	96 reactions	V7480
SignaTECT® Protein Kinase C (PKC) Assay System	96 reactions	V7470
SignaTECT® Protein Tyrosine Kinase (PTK) Assay System	96 reactions	V6480
SignaTECT® Calcium/Calmodulin-Dependent Protein Kinase (CaM KII) Assay System	96 reactions	V8161
SignaTECT® DNA-Dependent Protein Kinase Assay System	96 reactions	V7870
SignaTECT® cdc2 Protein Kinase Assay System	96 reactions	V6430

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SignaTECT® Protein Kinase Assay Systems contain the proprietary SAM²® Biotin Capture Membrane, which offers significant advantages over other radioactive technologies for assaying protein kinases. The streptavidin-coated SAM²® Membranes possess high binding capacity and high specificity characteristics, which produce lower backgrounds and higher signal-to-noise ratios compared to the traditional P81 phosphocellulose method of capture and measurement. The perforated and numbered membrane allows researchers to measure from 1 up to 96 kinase reactions. The SAM²® Membrane format does not require as much "hands-on" manipulation as other methods used to measure kinase activity. Following the kinase reaction, samples are spotted onto the SAM²® Membrane, and a series of short wash steps are performed to remove nonspecific label. The process is complete in less than 1 hour. In addition, the nature of the SAM²® Membrane allows it to be used under a variety of buffer/reaction conditions (e.g., cell extracts), which many other methods do not allow. Lastly, the high binding capacity allows use of the SignaTECT® Systems for kinetic studies.

Each system contains highly specific biotinylated peptide substrates for the appropriate kinase as well as the necessary reaction components. The researcher must supply [γ-^{32}P]ATP.

Storage Conditions: Store all SignaTECT® Systems except V7470 at –20°C. Store Cat.# V7470 at –70°C.



Schematic diagram of the SignaTECT® Protein Kinase Assay protocol. Protocol steps to prepare, run and analyze a specific protein kinase activity using any of the SignaTECT® Protein Kinase Assay Systems.

Available in the Helix® on-site stocking system

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PepTag® Non-Radioactive Protein Kinase Assays

Product	Size	Cat.#
PepTag® Non-Radioactive PKC Assay	120 reactions	V5330
PepTag® Non-Radioactive cAMP-Dependent Protein Kinase Assay	120 reactions	V5340

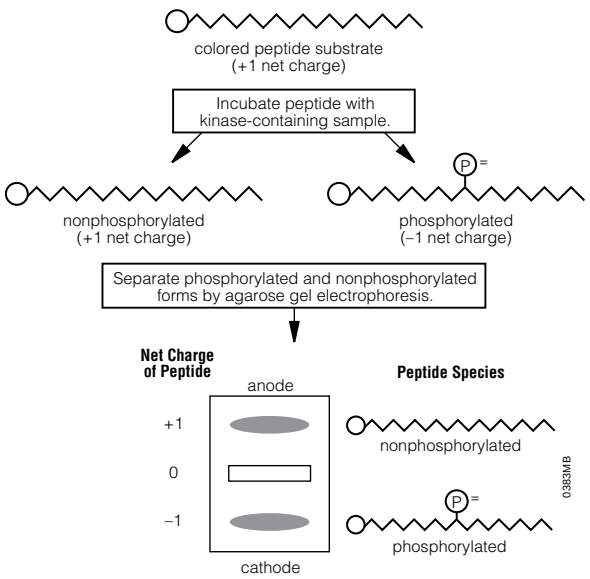
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PepTag® Non-Radioactive Protein Kinase Assay Systems provide a rapid, sensitive and non-radioactive method to detect either Protein Kinase C (PKC) or Protein Kinase A (PKA) activity. The PepTag® Assays use brightly colored, fluorescent peptide substrates that are highly specific for PKC (PepTag® C1 Peptide-PLSRTLSVAAK) and PKA (PepTag® A1 Peptide-LRRASLG). Phosphorylation of the peptide alters the net charge from +1 to –1. This change in the net charge allows the phosphorylated and nonphosphorylated versions of the substrate to be rapidly separated on an agarose gel at neutral pH. Using fluorescent detection, less than 2ng of purified kinase can be detected in less than 2 hours. The PepTag® Non-Radioactive Protein Kinase Assay Systems can detect kinase activity in partially purified samples as well as purified preparations of enzymes, making it a good choice for the rapid screening of column fractions or the screening of kinase activators and inhibitors. In addition to the assay components, each system includes purified kinase for use as a positive control.

Features:

- **Non-Radioactive:** The fluorescent tag on the peptide substrate facilitates quantitation of the phosphorylation reaction without the use of radioactivity.
- **Low Background:** Because the phosphorylation of the colored peptide supplied with the system is used to measure kinase activity, phosphorylation of other substrates occurring naturally in the sample does not add to the kinase activity measured.
- **Convenient:** Quantitation of the phosphorylated peptide can be accomplished using a densitometer, spectrophotometer, 96-well plate reader, or fluorometer.

Storage Conditions: Store at –70°C.



Schematic diagram of PepTag® Non-Radioactive Protein Kinase Assay procedure.

cAMP-Dependent Protein Kinase, Catalytic Subunit

Product	Size Conc.	Cat.#
cAMP-Dependent Protein Kinase, Catalytic Subunit	2,500 u 1.5–3 mg/ml	V5161

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The purified 40kDa cAMP-Dependent Protein Kinase (PKA), Catalytic Subunit, may be used to phosphorylate target proteins or for in vitro enzymological studies of neural and hormonal signal transduction. Intracellular targets include ion channels, transcriptional activator proteins, and regulatory enzymes of glycogen metabolism.

Features:

- **Highly Pure:** The PKA Catalytic Subunit has been purified from a recombinant *E. coli* strain expressing the catalytic subunit of bovine PKA and is 90% pure.

Storage Conditions: Store at –70°C.

DNA-Dependent Protein Kinase

Product	Size	Cat.#
DNA-Dependent Protein Kinase	2,500 u	V5811

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: DNA-Dependent Protein Kinase (DNA-PK) phosphorylates several DNA-binding substrates in vitro, including the tumor suppressor protein p53, the SV40 large T antigen and several transcription factors. DNA-PK is thought to play a role in controlling gene regulation and cell growth.

DNA-PK is isolated from HeLa nuclear extracts as a complex consisting of a 400kDa catalytic subunit and a 155kDa heterodimeric DNA-binding component named Ku, which itself consists of subunits of approximately 85kDa and 70kDa.

Storage Conditions: Store at –70°C.

cGMP-Dependent Protein Kinase

Product	Size	Cat.#
cGMP-Dependent Protein Kinase (α-Isozyme)	6,000 u	V5171

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: cGMP-Dependent Protein Kinase is a serine/threonine protein kinase present in smooth muscle and a variety of other tissues. The kinase is a 78kDa polypeptide composed of a regulatory domain and a catalytic domain and is active as a homodimer.

Specific Activity: >1,000u/µg (kinase activity).

Features:

- **Highly Pure:** cGMP-Dependent Protein Kinase has been purified by the method of Corbin and Doskeland and is >90% pure as determined by SDS-PAGE (single band).

Storage Conditions: Store at –70°C.

Casein Kinase I

Product	Size	Cat.#
Casein Kinase I	100 u	V5631
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Casein Kinase I (CKI or CK-1) is a ubiquitous and highly conserved serine/threonine protein kinase found in eukaryotic cells. CKI exists in multiple forms in mammalian tissue and is present in the nucleus, cytosol, plasma membrane and microsomes. CKI isolated from most species is a 35–37kDa monomer. In contrast to Casein Kinase II, CKI primarily uses Mg^{2+}/ATP as the phosphate donor and is not sensitive to heparin inhibition.

Storage Conditions: Store at –20°C.

EGF Receptor

Product	Size	Cat.#
EGF Receptor	10 u	V5551
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Epidermal Growth Factor Receptor (EGF Receptor) is a cell-surface glycoprotein composed of a single polypeptide chain that binds the peptide Epidermal Growth Factor (EGF). The EGF Receptor consists of an extracellular ligand binding domain, a single transmembrane region and a cytoplasmic intrinsic tyrosine kinase domain. Upon ligand binding, the EGF Receptor autophosphorylates, activating the tyrosine kinase domain of the EGF Receptor.

EGF Receptor is immunopurified from the A431 cell line following a procedure detailed by Weber *et al.*. The purified EGF Receptor does possess tyrosine kinase activity due to the bound EGF; however, the EGF Receptor has not been autophosphorylated.

Storage Conditions: Store at –70°C.

Protein Kinase C

Product	Size Conc.	Cat.#
Protein Kinase C	1 µg 25 µg/ml	V5261
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Protein Kinase C is an 82kDa monomeric enzyme consisting of a C-terminal catalytic domain and a cysteine-rich N-terminal regulatory domain. The regulatory domain contains the sites for calcium and phospholipid binding and a pseudosubstrate subdomain, the target for PKC autophosphorylation. PKC is isolated from rat brain following the procedure of Walton and colleagues. The purified PKC consists primarily of α, β and γ isoforms with lesser amounts of δ and ζ isoforms.

Features:

- **Highly Pure:** PKC is greater than 90% pure as determined by SDS-PAGE.

Storage Conditions: Store at –70°C.

Cell Signaling Antibodies

Anti-pS^{473} Akt pAb

Product	Size	Cat.#
Anti-pS^{473} Akt pAb	40 µl	G7441
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 222.

Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)

Product	Size	Cat.#
Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)	40 µl	V7931
	120 µl	V7932
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 223.

Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)

Product	Size	Cat.#
Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)	40 µl	V8031
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 223.

Anti-ACTIVE® p38 pAb, Rabbit, (pTGpY)

Product	Size	Cat.#
Anti-ACTIVE® p38 pAb, Rabbit, (pTGpY)	100 µl	V1211
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 224.

Anti-ERK 1/2 pAb, Rabbit

Product	Size	Cat.#
Anti-ERK 1/2 pAb, Rabbit	40 µl	V1141
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 225

Donkey Anti-Rabbit IgG (H+L) HRP, Anti-ACTIVE® Qualified

Product	Size	Cat.#
Donkey Anti-Rabbit IgG (H+L), HRP	60 µl	V7951
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 230.

Protein Kinase Inhibitors, Activators and Substrates

Protein Kinase Inhibitors and Activators

Product	Size	Cat.#
MEK Inhibitor U0126	5 mg	V1121
cAMP-Dependent Protein Kinase Peptide Inhibitor	1 mg	V5681
Myristoylated Protein Kinase C Peptide Inhibitor	1 mg	V5691
InCELLect™ AKAP St-Ht31 Inhibitor Peptide	150 µl	V8211
InCELLect™ St-Ht31P Control Peptide	150 µl	V8221
Olomoucine (cdc2 Protein Kinase Inhibitor)	0.5 mg	V2372
	10 mg	V2373
PD 98059	5 mg	V1191
SB 203580	1 mg	V1161
LY 294002	5 mg	V1201
PMA	5 mg	V1171
4α-PMA	1 mg	V1181

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Product	Size	Cat.#
cGMP, 1mM	500 µl	V6411
cAMP, 1mM	500 µl	V6421

For Laboratory Use.

Protein Kinase Substrates

Product	Size Conc.	Cat.#
Kemptide (PKA) Peptide Substrate	1 mg 10 mg/ml	V5601
Neurogranin$_{(28–43)}$ (PKC) Peptide Substrate	1 mg 10 mg/ml	V5611
DNA-Dependent Protein Kinase Peptide Substrate	1 mg 10 mg/ml	V5671

For Research Use Only. Not for Use in Diagnostic Procedures.

Protein Phosphatases and Phosphatase Assays

PPase-2A

Product	Size	Cat.#
PPase-2A	25 u	V6311

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Protein Phosphatase-2A (PPase-2A) is a serine/threonine phosphatase isolated from human red blood cells. It is isolated as the heterodimer of 60kDa (A) and 36kDa (C) subunits. It has the ability to dephosphorylate the α-subunit of phosphorylase kinase. With its 36–38kDa catalytic subunit, PPase-2A has broad substrate specificity and may play a regulatory role in DNA replication, transcription, protein synthesis, mitosis and glycogen metabolism. PPase-2A is stimulated in vitro by basic proteins such as protamine, histones and polylysine. The enzyme is inhibited by several environmental toxins and tumor promoters such as okadaic acid and microcystin-LR. The chemically synthesized phosphopeptide, RRA(pT)VA (available in the Ser/Thr Phosphatase Assay System, Cat.# V2460), is an excellent substrate for PPase-2A.

Storage Conditions: Store at –20°C.

PPase-2B

Product	Size	Cat.#
PPase-2B	10 u	V6361

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: PPase-2B is a heterodimeric enzyme composed of a 19kDa calcium-binding subunit and a catalytic subunit (61kDa) that binds calmodulin. PPase-2B was originally identified based on its calcium- and calmodulin-dependent activity toward phosphorylase kinase and inhibitor-1. PPase-2B is identical to the brain protein calcineurin, which constitutes up to 1% of total brain protein. The immunosuppressive drugs FK-506 and cyclosporin A inhibit PPase-2B activity in immune cells, implicating a role for this enzyme in regulation of the immune system. PPase-2B also plays a major role in regulating secretory functions of a variety of cells.

PPase-2B is less sensitive to okadaic acid than PPase-2A and PPase-1, requiring micromolar concentrations of okadaic acid for inhibition. It is not inhibited by Inhibitor-1 or Inhibitor-2. Promega PPase-2B is isolated from bovine brain.

Storage Conditions: Store at –70°C.

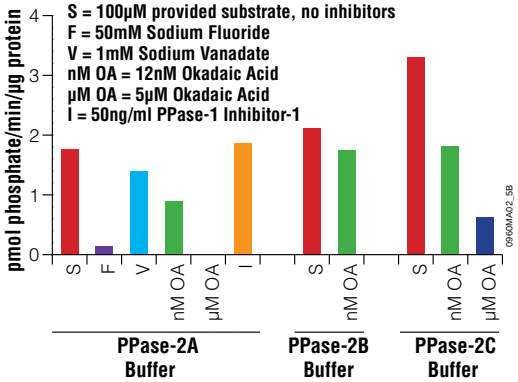
Non-Radioactive Phosphatase Assay Systems

Product	Size	Cat.#
Serine/Threonine Phosphatase Assay System	96 reactions	V2460
Tyrosine Phosphatase Assay System	96 reactions	V2471
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Non-Radioactive Phosphatase Assay Systems provide a fast, convenient and flexible alternative for measuring protein phosphatase activity. These systems determine the amount of free phosphate generated in a reaction by measuring the absorbance of a molybdate:malachite green:phosphate complex. These systems allow the use of a variety of buffer conditions and substrates, including naturally phosphorylated proteins or synthetic phosphopeptides. The Serine/Threonine Phosphatase Assay System contains the chemically synthesized phosphopetide, RRA(pT)VA, a peptide substrate that is compatible with several serine/threonine phosphatases such as the Protein Phosphatases 2A, 2B, and 2C. **However the supplied phosphopeptide is a poor substrate for Protein Phosphatase 1 because of its more stringent structural requirements.**

The Tyrosine Phosphatase Assay System contains two chemically synthesized phosphopeptides, END(pY)INASL and DADE(pY)LIPQQG, that serve as substrates for many protein tyrosine phosphatases. The effective range for the detection of phosphate released during an assay using the Phosphatase Assay Systems is 100–4,000pmol of phosphate. In addition to measuring phosphatase activity in partially fractionated and purified samples, the Phosphatase Assay Systems can also measure phosphatase activity in crude cell or tissue extracts. For this application, the high concentration of phosphate in these preparations is eliminated prior to performing the assay using the supplied Spin Columns, which rapidly and effectively remove free phosphate and other low-molecular-weight inhibitors from the sample. In addition, a unique Molybdate Dye Additive that is combined with the Molybdate Dye Solution aids in the solubilization of proteins exposed to the acid conditions of the Molybdate Dye Solution, which alone could potentially cause precipitation of the proteins.

Storage Conditions: Store the entire kit at 4°C.



Serine/Threonine phosphatase activity in HeLa cell extract using the Serine/Threonine Phosphatase Assay System.

Available in the Helix® on-site stocking system
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ProFluor® Ser/Thr PPase Assay

Product	Size	Cat.#
ProFluor® Ser/Thr PPase Assay	4 plate	V1260
	8 plate	V1261

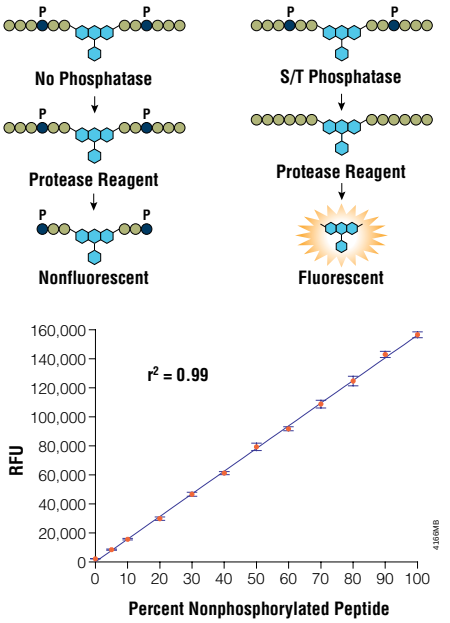
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ProFluor® Ser/Thr PPase Assay measures purified serine/threonine protein phosphatase activity in a multiwell plate format and involves "add-mix-read" steps only—ideal for high-throughput applications. The assay works with protein phosphatase 1 (PP1), PP2A, PP2B and PP2C. The assay begins with a standard phosphatase reaction performed with a provided phosphorylated bisamide rhodamine 110 peptide substrate (S/T PPase R110 Substrate) and Control AMC Substrate that serves as a control for compounds that may inhibit the protease reaction. Following the phosphatase reaction, a termination buffer containing a protease reagent is added, which simultaneously stops the phosphatase reaction and removes amino acids specifically from the nonphosphorylated substrate, liberating highly fluorescent rhodamine 110. Phosphorylated substrate, however, is resistant to digestion by the protease reagent and remains nonfluorescent. Thus, fluorescence intensity measured in this assay is directly correlated with phosphatase activity. The assay produces excellent Z′ values (>0.8) in either 96- or 384-well plate formats and easily distinguishes known phosphatase inhibitors from other compounds.

Features:

- **Achieve Highly Predictive Results:** Robust Z′ values greater than 0.7 in either 96- or 384-well plate formats.
- **Observe Minimal Test Compound Interference:** Rhodamine 110 fluorescent signal produced is much higher than the fluorescent signal given off by test compounds.
- **Control Peptide Included:** Use AAF-AMC control peptide to monitor protease activity and reduce false-positive hits.
- **Simplify Your Assays:** Add-mix-read format reduces the number of steps.
- **Non-Radioactive:** No radioactive waste disposal and safety issues.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the entire system at –20°C. Protect the S/T PPase R110 Substrate and Control AMC Substrate from light.



Effect of phosphopeptide content on fluorescence intensity. The graph shows the average RFU obtained after a 90-minute digestion of mixtures of nonphosphorylated S/T PPase R110 Substrate and phosphorylated substrate as indicated to mimic a phosphatase titration.

ProFluor® Tyrosine Phosphatase Assay

Product	Size	Cat.#
ProFluor® Tyrosine Phosphatase Assay	4 plate	V1280
	8 plate	V1281

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ProFluor® Tyrosine Phosphatase Assay measures purified tyrosine phosphatase enzyme activity in a multiwell plate format and involves "add-mix-read" steps only—ideal for high-throughput applications. Tyrosine phosphatases tested with the assay include PTP-1B, CD45, LAR PTPase and YOP-51. The assay begins with a standard phosphatase reaction performed with a provided phosphorylated bisamide rhodamine 110 peptide substrate (PTPase R110 Substrate) and Control AMC Substrate that serves as a control for compounds that may inhibit the protease. Following the phosphatase reaction, a termination buffer containing a protease reagent is added, which simultaneously stops the phosphatase reaction and removes amino acids specifically from the nonphosphorylated substrate, liberating highly fluorescent rhodamine 110. Phosphorylated substrate, however, is resistant to digestion by the protease reagent and remains nonfluorescent. Thus, fluorescence intensity measured in this assay is directly correlated with phosphatase activity. The assay produces excellent Z′ values (>0.7) in either 96- or 384-well plate formats and easily distinguishes known phosphatase inhibitors from other compounds.

Features:

- **Achieve Highly Predictive Results:** Robust Z′ values greater than 0.8 in either 96- or 384-well plate formats.
- **Observe Minimal Test Compound Interference:** Substrate used at micromolar concentration. Rhodamine 110 fluorescent signal produced is much higher than the fluorescent signal given off by test compounds.
- **Control Peptide Included:** Control peptide (AAF-AMC) included that is used to monitor protease activity. Reduces false positive hits.
- **Simplify Your Assays:** Simple add-mix-read format reduces the number of plate-handling steps to fewer than that required for other phosphatase assays.
- **Save Time:** Minimal throughput time compared to the multiple steps and lengthy incubations with other phoshatase assays.
- **Non-Radioactive:** No radioactive waste disposal and safety issues.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the entire system at –20°C. Protect the PTPase R110 Substrate and Control AMC Substrate from light.

6 Cloning and DNA Markers

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Molecular Weight Markers

BenchTop DNA Markers

Product	Size	Cat.#
BenchTop ΦX174 DNA/HaeIII Markers	250 µl	G7511
BenchTop pGEM® DNA Markers	250 µl	G7521
BenchTop PCR Markers	300 µl	G7531
BenchTop 1kb DNA Ladder	600 µl	G7541
BenchTop 100bp DNA Ladder	300 µl	G8291

For Laboratory Use.

Description: The BenchTop DNA Markers offer the convenience of storage at room temperature (22–25°C) as well as the capability of direct loading onto agarose gels. The BenchTop DNA Markers are supplied in a stabilizing solution of 1X Blue/Orange Loading Dye, which circumvents any requirements for further manipulation.

BenchTop ΦX174 DNA/HaeIII Markers: Eleven phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 72bp to 1,353bp.

BenchTop pGEM® DNA Markers: Fifteen phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 36bp to 2,645bp. These unique markers are generated from separate digests of pGEM®-3 Vector DNA with HinfI, RsaI and SinI later combined to form the markers.

BenchTop PCR Markers: Six bands of equal intensity of 50, 150, 300, 500, 750, and 1,000bp. The BenchTop PCR Markers may be run on polyacrylamide gels with less loading volume; however, additional bands may be visible compared to those visible on agarose gels.

BenchTop 1kb DNA Ladder: Thirteen blunt-ended fragments with sizes ranging from 250bp to 10,000bp. The 1,000bp and 3,000bp fragments have increased intensity relative to the other bands on ethidium bromide-stained agarose gels for easy identification. All other fragments are of equal intensity. The ladder is dephosphorylated and ready for 5′ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

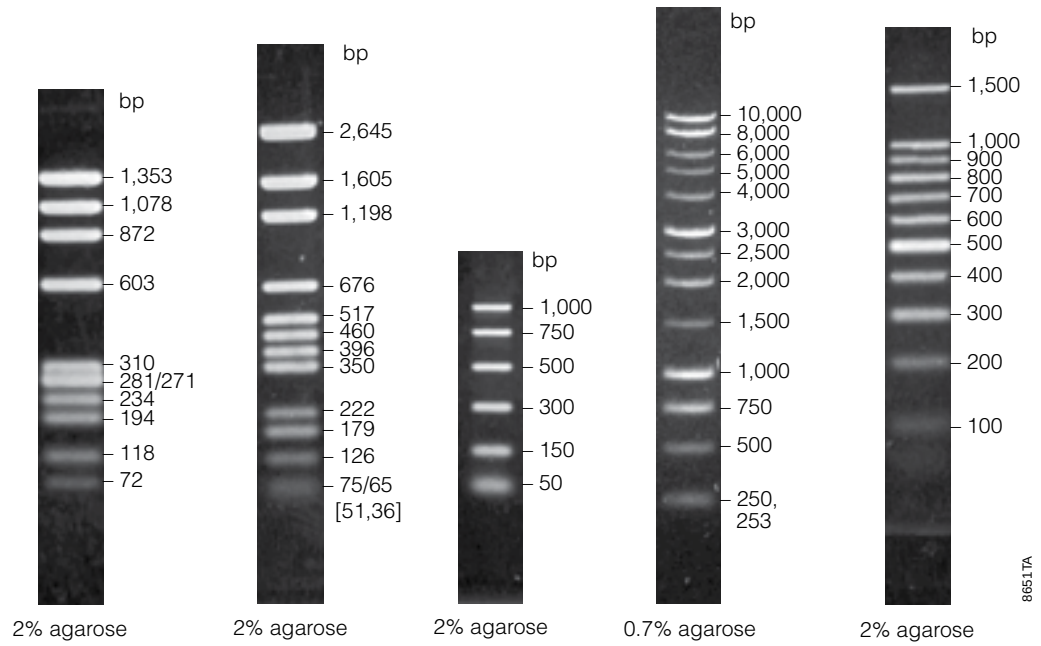
BenchTop 100bp DNA Ladder: Eleven fragments that range in size from 100bp to 1,000bp in 100bp increments with an additional band at 1,500bp. The 500bp fragment is present at increased intensity for easy identification. The ladder is dephosphorylated and ready for 5′ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

Recommended Loading: Cat.# G7511, G7521: Load 5µl/lane. Cat.# G7531, G7541, G8291: Load 6µl/lane.

Features:

- **Convenient:** Storage at 22–25°C.
- **Efficient:** Premixed with loading buffer. Ready to load onto agarose gels.
- **Versatile:** Five different BenchTop DNA Markers available.

Storage Conditions: Store at 22–25°C.



DNA Step Ladders

Product	Size	Conc.	Cat.#
10bp DNA Step Ladder	32.5 µg	0.65 µg/µl	G4471
25bp DNA Step Ladder	100 µg	0.36 µg/µl	G4511
50bp DNA Step Ladder	90 µg	0.34 µg/µl	G4521
100bp DNA Step Ladder	100 µg	1 µg/µl	G6951
200bp DNA Step Ladder	100 µg	1 µg/µl	G6961
1kb DNA Step Ladder	90 µg	0.3 µg/µl	G6941

For Laboratory Use.

Description: The DNA Step Ladders are ladders of defined sizes with exact incremental steps between bands. The ladders are not intended for use in quantitative analysis. Each ladder is provided with a tube of 6X Blue/Orange Loading Dye. The fragments may be stained with ethidium bromide.

10bp DNA Step Ladder: Ten blunt-ended DNA fragments ranging from 10bp to 100bp in exactly 10bp increments. All of the bands are of approximately equal intensity with the exception of the 10bp band, which may appear slightly less intense.

25bp DNA Step Ladder: Twelve DNA fragments ranging from 25bp to 300bp in 25bp increments. An 1,800bp "backbone" fragment is also visible. The 300bp band is ≈3 times more intense than all other bands.

50bp DNA Step Ladder: Sixteen DNA fragments ranging from 50bp to 800bp in 50bp increments plus an 1,800bp "backbone" fragment. All bands except the 800bp band are of equal intensity; the 800bp band is ≈3 times more intense.

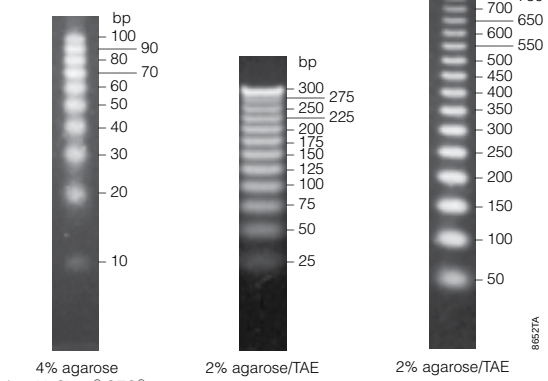
100bp DNA Step Ladder: Forty blunt-ended DNA fragments ranging from 100bp to 4,000bp in 100bp increments. Two internal features facilitate band identification. A high-intensity 500bp band stands out at the lowest segment of the ladder (<1kb). Bands within each segment (<1kb, <2kb, <4kb) have approximately the same intensity.

200bp DNA Step Ladder: Thirty-three blunt-ended DNA fragments ranging from 200bp to 6,600bp in 200bp increments. The 1,000bp band appears more intense than all other bands, which are of approximately equal intensity.

1kb DNA Step Ladder: Ten blunt-ended DNA fragments ranging from 1kb to 10kb in 1kb increments. All bands except the 5kb band are of equal intensity; the 5kb band is ≈3 times more intense.

Recommended Loading: Cat.# G4471, G6951, G6961, G6941: Load 1µl/lane. Cat.# G4511, G4521: Load 5µl/lane.

Storage Conditions: Store at –20°C.



4% agarose (3% NuSieve® GTG® agarose/1% agarose)

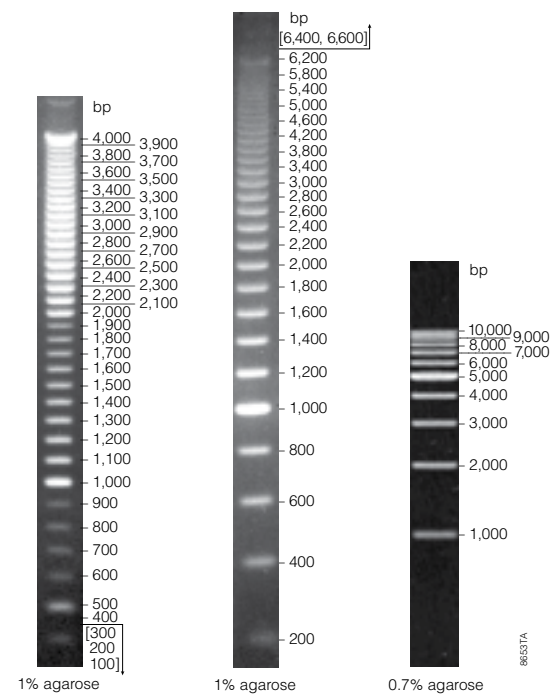
10bp DNA Step Ladder
Cat.# G4471
Load 1µl/lane.

2% agarose/TAE

25bp DNA Step Ladder
Cat.# G4511
Load 5µl/lane.

2% agarose/TAE

50bp DNA Step Ladder
Cat.# G4521
Load 5µl/lane.



1% agarose

100bp DNA Step Ladder

1% agarose

200bp DNA Step Ladder

0.7% agarose

1kb DNA Step Ladder

Available in the Helix® on-site stocking system

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DNA Ladders

Product	Size	Conc.	Cat.#
PCR Markers	250 µl	~0.06 µg/µl	G3161
100bp DNA Ladder	250 µl	0.13 µg/µl	G2101
1kb DNA Ladder	500 µl	0.1 µg/µl	G5711

For Laboratory Use.

Description: The DNA Ladders are ladders with defined sizes. The ladders are not intended for use in quantitative analysis. Each ladder is provided with a tube of 6X Blue/Orange Loading Dye.

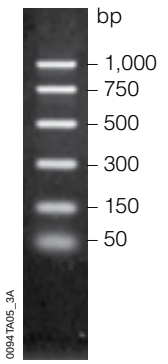
PCR Markers: Six bands of equal intensity of 50, 150, 300, 500, 750 and 1,000bp. The PCR Markers may be run on polyacrylamide gels with less loading volume; however, additional bands may be visible compared to those visible on agarose gels.

100bp DNA Ladder: Eleven fragments that range in size from 100bp to 1,000bp in 100bp increments with an additional band at 1,500bp. The 500bp fragment is present at increased intensity for easy identification. The ladder is dephosphorylated and ready for 5´ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

1kb DNA Ladder: Thirteen blunt-ended fragments with sizes ranging from 250bp to 10,000bp. The 1,000bp and 3,000bp fragments have increased intensity relative to the other bands on ethidium bromide-stained agarose gels for easy identification. All other fragments are of equal intensity. The ladder is dephosphorylated and ready for 5´ end-labeling with radioisotopes using T4 Polynucleotide Kinase, allowing visualization by autoradiography.

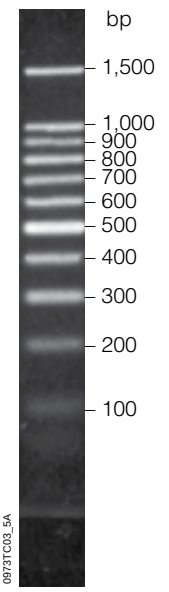
Recommended Loading: Load 5µl/lane.

Storage Conditions: Store at –20°C.



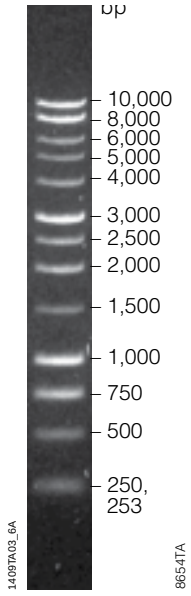
2% agarose

PCR Markers
Cat.# G3161
Load 5µl/lane.



2% agarose

100bp DNA Ladder
Cat.# G2101
Load 5µl/lane.



0.7% agarose

1kb DNA Ladder
Cat.# G5711
Load 5µl/lane.

Conventional DNA Markers

Product	Size	Conc.	Cat.#
Lambda DNA/HindIII Markers	100 µg	0.5 µg/µl	G1711
Lambda DNA/EcoRI Markers	100 µg	0.5 µg/µl	G1721
Lambda DNA/EcoRI + HindIII Markers	100 µg	0.5 µg/µl	G1731
ΦX174 DNA/HaeIII Markers	50 µg	1 µg/µl	G1761
ΦX174 DNA/HinfI Markers	50 µg	1 µg/µl	G1751
pGEM® DNA Markers	50 µg	1 µg/µl	G1741

For Laboratory Use.

Description: The Conventional DNA Digest Markers are created by digesting either λ DNA, ΦX174 replicative form DNA, or plasmids to completion with one or more restriction enzymes. The enzymes are heat-inactivated, and the DNA fragments are either phenol-extracted, then ethanol-precipitated or just ethanol-precipitated. The precipitated fragments are resuspended in storage buffer. The markers are not intended for quantitative analysis. Each marker is supplied with a tube of 6X Blue/Orange Loading Dye.

λ DNA/HindIII Markers: Eight ethanol-precipitated DNA fragments ranging in size from 125bp to 23,130bp.

λ DNA/EcoRI Markers: Six ethanol-precipitated DNA fragments ranging in size from 3,530bp to 21,226bp.

λ DNA/EcoRI + HindIII Markers: Thirteen ethanol-precipitated DNA fragments ranging in size from 125bp to 21,226bp.

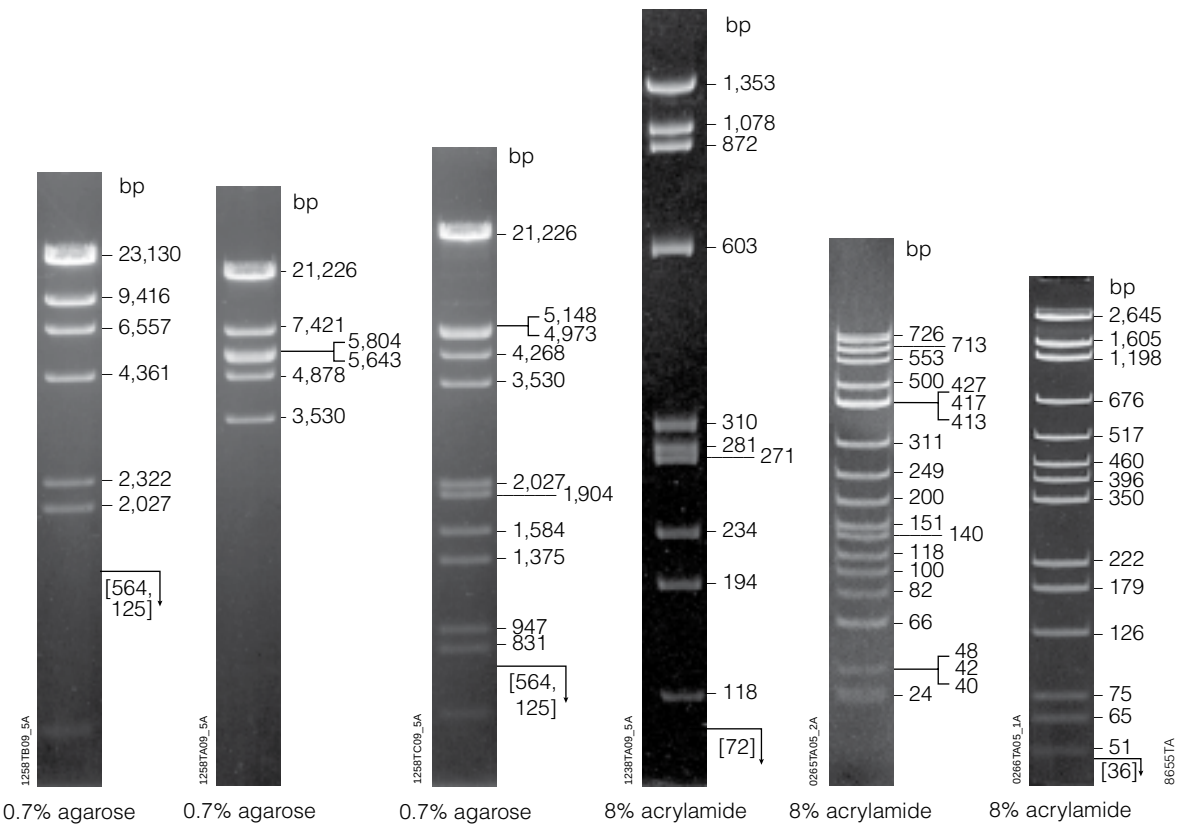
ΦX174 DNA/HaeIII Markers: Eleven phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 72bp to 1,353bp.

ΦX174 DNA/HinfI Markers: Twenty ethanol-precipitated DNA fragments ranging in size from 24bp to 726bp.

pGEM® DNA Markers: Fifteen phenol-extracted, ethanol-precipitated DNA fragments ranging in size from 36bp to 2,645bp. These unique markers are generated from separate digests of pGEM®-3 Vector DNA with HinfI, RsaI and AvaII later combined to form the markers.

Recommended Loading: Load 1µl/lane.

Storage Conditions: Store at –20°C.



Available in the Helix® on-site stocking system

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ΦX174 DNA/HinfI Dephosphorylated Markers

Product	Size	Cat.#
ΦX174 DNA/HinfI Dephosphorylated Markers	2.5 µg	E3511

For Research Use Only. Not for Use in Diagnostic Procedures.

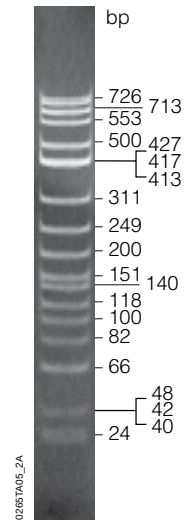
Description: ΦX174 DNA/HinfI Dephosphorylated Markers are prepared by digesting double-stranded ΦX174 DNA to completion with HinfI. The DNA fragments are then treated with calf intestinal alkaline phosphatase, phenol:chloroform-extracted, ethanol-precipitated and resuspended in TE buffer, making the markers ready for 5´ end-labeling. The 20 DNA fragments range in size from 24–726bp. The markers are not intended for use in quantitative analysis.

This marker is especially convenient for applications such as primer extension, requiring DNA or RNA size estimations.

Features:

- **Concentration:** 50µg/ml.
- **Range (bp):** 24–726.
- **Number of Bands:** 20.
- **Convenient:** Ready to label.

Storage Conditions: Store at –20°C.



8% acrylamide

ϕX174 DNA/
HinfI Markers
Cat.# G1751
Load 1µl/lane.

ProMega-Markers® Lambda Ladders

Product	Size	Cat.#
ProMega-Markers® Lambda Ladders	40–60 lanes	G3011

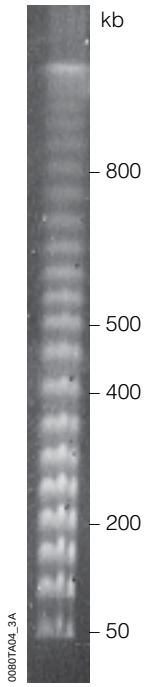
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ProMega-Markers® Lambda Ladders are prepared by concatemerization of λ phage DNA into multimers ranging in size from 50kb to 800kb and up, with each multimer, or rung, of the 20-step ladder differing in size by one λ genome (approximately 48.5kb). The ladders are embedded in dye-colored, 0.5% agarose string molds in 50mM EDTA. The ladders are not intended for use in quantitative analysis.

Features:

- **Concentration:** 0.5µg/5mm.
- **Range (bp):** 50,000–800,000 and up.

Storage Conditions: Store at 4°C. **Do not freeze.**



0.6% agarose

RNA Markers

Product	Size	Cat.#
RNA Markers	50 µl	G3191
For Research Use Only. Not for Use in Diagnostic Procedures.		

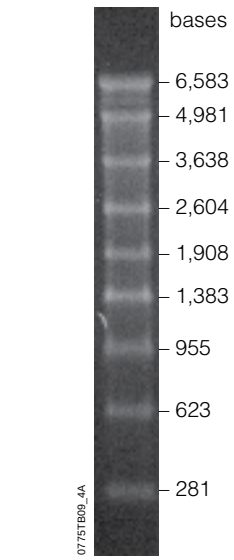
Description: Promega RNA Markers are suitable for size estimation of single-stranded RNA from 0.28–6.58kb in glyoxal or formaldehyde-agarose gels. The RNA Markers consist of a ladder of nine RNA transcripts that are synthesized in vitro from specific templates. The sizes are 281, 623, 955, 1,383, 1,908, 2,604, 3,638, 4,981 and 6,583 bases. The markers are not intended for use in quantitative analysis. After electrophoresis, the fragments can be visualized by ethidium bromide staining.

Recommended Loading: 3µl (prepared in formaldehyde/MOPS buffer and separated onto a 1% formaldehyde-agarose gel using MOPS running buffer).

Features:

- **Range (bases):** 281–6,583.
- **Number of Bands:** 9.

Storage Conditions: Store at –70°C.



1% formaldehyde-agarose

Broad Range Protein Molecular Weight Markers

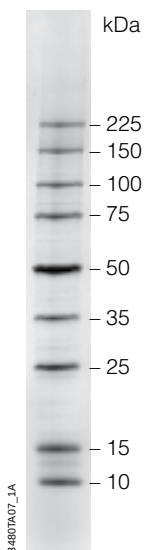
Product	Size	Conc.	Cat.#
Broad Range Protein Molecular Weight Markers	100 lanes	5 µl/lane	V8491
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The Broad Range Protein Molecular Weight Markers consist of nine clearly identifiable bands at convenient molecular weights. The protein sizes are 10, 15, 25, 35, 50, 75, 100, 150 and 225kDa. Each protein is present at a concentration of 0.1µg/µl, except for the 50kDa protein, which is present at 0.3µg/µl and serves as a reference indicator, having triple the intensity of the other proteins. All other proteins appear with equal intensity on the gel. These markers are intended for use as a size standard when performing SDS-PAGE (sodium dodecyl sulfate-polyacrylamide gel electrophoresis) for estimation of the molecular weight of the protein of interest. Note that they are not stained.

Features:

- **Reference Band:** Band at 50kDa is 3X intensity for use as a reference.
- **Convenient:** 9 bands at evenly spaced intervals.
- **Fast:** Ready to load.

Storage Conditions: Store at –20°C (weekly/monthly use) or 4°C (daily use).



4–20% Tris-Glycine SDS-PAGE gel

Available in the Helix® on-site stocking system

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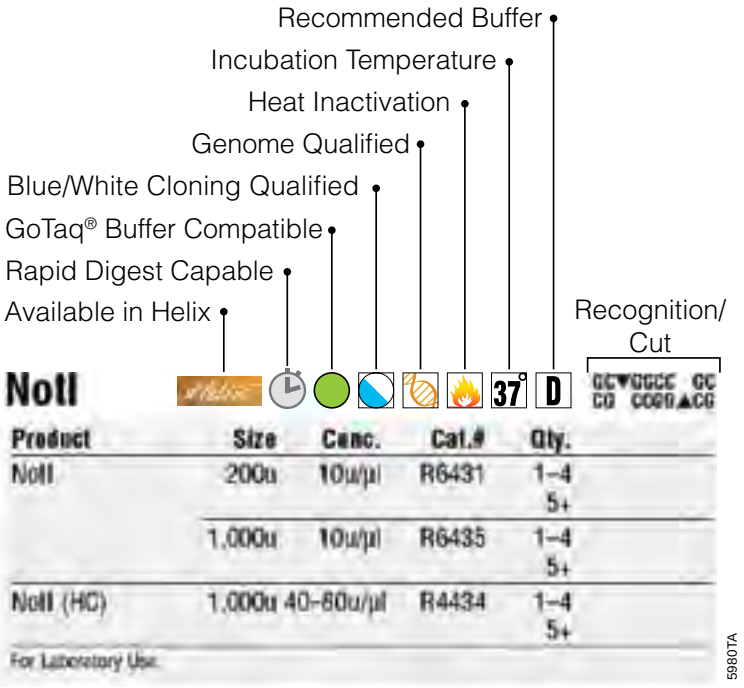
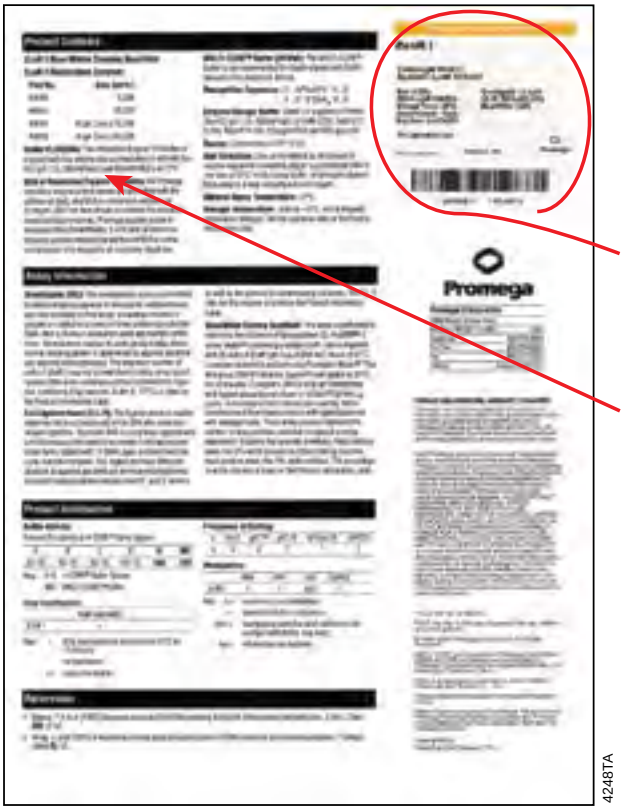
Restriction Enzymes

All the Information You Need—At a Glance

On the following pages, restriction enzyme information is organized using icons to help you quickly and easily identify the features of each enzyme. See the diagram to the right to identify the meaning of the icons used.



Product Usage, Quality Control and Lot-Specific Information



Each enzyme comes in recyclable packaging that holds the enzyme, buffers (if applicable) and a lot-specific Product Information Sheet. The Product Information Sheet contains details of the quality control assays performed, product storage and usage information, protocols and references. Lot-specific information is printed on a removable sticker that can be pasted into a notebook or log book, simplifying your record-keeping.

Acc65I

Product	Size	Conc.	Cat.#
Acc65I	1,500 u	10 u/µl	R6921

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼GTAC C
C CATG▲G

Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.

Storage Conditions: Store at –20°C.

AccI

Product	Size	Conc.	Cat.#
AccI	100 u	3–10 u/µl	R6411
	500 u	3–10 u/µl	R6415

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GT▼(A/C)(T/G) AC
CA (T/G)(A/C)▲TG

Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

AccIII

Product	Size	Conc.	Cat.#
AccIII	200 u	10 u/µl	R6581

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
T▼CCGG A
A GGCC▲T

Storage Conditions: Store at –20°C. **Do not freeze.**

AgeI

Product	Size	Conc.	Cat.#
AgeI	100 u	3–10 u/µl	R7251

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
A▼CCGG T
T GGCC▲A

Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

AluI

Product	Size	Conc.	Cat.#
AluI	500 u	10 u/µl	R6281

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AG▼CT
TC▲GA

Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

ApaI

Product	Size	Conc.	Cat.#
ApaI	5,000 u	10 u/µl	R6361
ApaI (HC)	25,000 u	40–80 u/µl	R4364

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G GGCC▼C
C▲CCGG G

Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

AvaI

Product	Size	Conc.	Cat.#
AvaI	200 u	8–12 u/µl	R6091
	1,000 u	8–12 u/µl	R6095

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼(T/C)CG(A/G) G
G (A/G)GC(T/C)▲C

Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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AvaII

Product	Size	Conc.	Cat.#
AvaII	100 u	1–10 u/µl	R6131
	1,000 u	1–10 u/µl	R6135

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼G(A/T)C C
C C(T/A)G▲G
Storage Conditions: Store at –20°C.

BalI

Product	Size	Conc.	Cat.#
BalI	50 u	2–10 u/µl	R6691
	250 u	2–10 u/µl	R6695

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
TGG▼CCA
ACC▲GGT
Storage Conditions: Store at –20°C.

BamHI

Product	Size	Conc.	Cat.#
BamHI	2,500 u	10 u/µl	R6021
	12,500 u	10 u/µl	R6025
BamHI (HC)	12,500 u	40–80 u/µl	R4024
	50,000 u	40–80 u/µl	R4027

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼GATC C
C CTAG▲G
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

BanI

Product	Size	Conc.	Cat.#
BanI	200 u	8–12 u/µl	R6891

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼ G(T/C)(A/G)C C
C C(A/G)(T/C)G▲G
Storage Conditions: Store at –20°C.

BclI

Product	Size	Conc.	Cat.#
BclI	1,000 u	10 u/µl	R6651

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
T▼GATC A
A CTAG▲T
Storage Conditions: Store at –20°C.

BglI

Product	Size	Conc.	Cat.#
BglI	1,000 u	10 u/µl	R6071
	5,000 u	10 u/µl	R6077
BglI (HC)	5,000 u	40–80 u/µl	R4074

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GCCN NNN▼NGGC
CGGN▲NNN NCCG
Storage Conditions: Store at –20°C.

BglII

Product	Size	Conc.	Cat.#
BglII	500 u	10 u/µl	R6081
	2,500 u	10 u/µl	R6085
	10,000 u	10 u/µl	R6087

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
A▼ GATC T
T CTAG▲A
Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

BsrSI

Product	Size	Conc.	Cat.#
BsrSI	500 u	10 u/µl	R7241

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
ACTG GN▼
TGAC▲CN
Storage Conditions: Store at –20°C.

BssHII

50° H

Product	Size	Conc.	Cat.#
BssHII	100 u	10 u/µl	R6831
	500 u	10 u/µl	R6835

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼CGCG C
C GCGC▲G
Storage Conditions: Store at –20°C.

BstEII

60° D

Product	Size	Conc.	Cat.#
BstEII	2,000 u	10 u/µl	R6641

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼ GTNAC C
C CANTG▲G
Storage Conditions: Store at –20°C.

BstOI

60° C

Product	Size	Conc.	Cat.#
BstOI	2,000 u	10 u/µl	R6931

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CC▼(A/T) GG
GG (T/A)▲CC
Storage Conditions: Store at –20°C.

BstXI

50° D

Product	Size	Conc.	Cat.#
BstXI	250 u	8–12 u/µl	R6471
	1,000 u	8–12 u/µl	R6475

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CCAN NNNN▼NTGG
GGTN▲NNNN NACC
Storage Conditions: Store at –20°C.

BstZI

50° D

Product	Size	Conc.	Cat.#
BstZI	500 u	10 u/µl	R6881

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼GGCC G
G CCGG▲C
Storage Conditions: Store at –20°C.

CfoI

37° B

Product	Size	Conc.	Cat.#
CfoI	3,000 u	10 u/µl	R6241

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G CG▼C
C▲GC G
Storage Conditions: Store at –20°C.

ClaI

37° C

Product	Size	Conc.	Cat.#
ClaI	500 u	10 u/µl	R6551
	2,500 u	10 u/µl	R6555

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AT▼CG AT
TA GC▲TA
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

CspI

30° K

Product	Size	Conc.	Cat.#
CspI	500 u	10 u/µl	R6675

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CG▼G(A/T)C CG
GC C(T/A)G▲GC
Storage Conditions: Store at –20°C.

DdeI

37° D

Product	Size	Conc.	Cat.#
DdeI	200 u	10 u/µl	R6291
	1,000 u	10 u/µl	R6295

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼TNA G
G ANT▲C
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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DpnI

Product	Size	Conc.	Cat.#
DpnI	200 u	10 u/µl	R6231

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G^{me}A▼TC
CT▲^{me}AG

Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

DraI

Product	Size	Conc.	Cat.#
DraI	2,000 u	10 u/µl	R6271

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
TTT▼AAA
AAA▲TTT

Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

Eco47III

Product	Size	Conc.	Cat.#
Eco47III	50 u	2–5 u/µl	R6731

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AGC▼GCT
TCG▲CGA

Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

EcoICRI

Product	Size	Conc.	Cat.#
EcoICRI	1,000 u	10 u/µl	R6951

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GAG▼CTC
CTC▲GAG

Storage Conditions: Store at –20°C.

EcoRI

Product	Size	Conc.	Cat.#
EcoRI	5,000 u	12 u/µl	R6011
	15,000 u	12 u/µl	R6017
EcoRI (HC)	25,000 u	40–80 u/µl	R4014
	50,000 u	40–80 u/µl	R4017

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼AATT C
C TTAA▲G

Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

EcoRV

Product	Size	Conc.	Cat.#
EcoRV	2,000 u	10 u/µl	R6351
	10,000 u	10 u/µl	R6355
EcoRV (HC)	10,000 u	40–80 u/µl	R4354

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GAT▼ATC
CTA▲TAG

Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

HaeII

Product	Size	Conc.	Cat.#
HaeII	1,000 u	10 u/µl	R6661

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
(A/G) GCGC▼(T/C)
(T/C)▲CGCG (A/G)

Storage Conditions: Store at –20°C.

HaeIII

Product	Size	Conc.	Cat.#
HaeIII	2,500 u	10 u/µl	R6171
	10,000 u	10 u/µl	R6175
HaeIII (HC)	12,500 u	40–80 u/µl	R4174

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GG▼CC
CC▲GG

Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

HhaI

Product	Size	Conc.	Cat.#
HhaI	1,000 u	10 u/µl	R6441

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G CG▼C
C▲GC G
Storage Conditions: Store at –20°C.

HincII

Product	Size	Conc.	Cat.#
HincII	200 u	10 u/µl	R6031
	1,000 u	10 u/µl	R6035
	5,000 u	10 u/µl	R6037

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GT(T/C)▼(A/G)AC
CA(A/G)▲(T/C)TG
Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

HindIII

Product	Size	Conc.	Cat.#
HindIII	5,000 u	10 u/µl	R6041
	15,000 u	10 u/µl	R6045
HindIII (HC)	25,000 u	40–80 u/µl	R4044
	50,000 u	40–80 u/µl	R4047

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
A▼AGCT T
T TCGA▲A
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

HinfI

Product	Size	Conc.	Cat.#
HinfI	1,000 u	10 u/µl	R6201
	5,000 u	10 u/µl	R6205
HinfI (HC)	5,000 u	40–80 u/µl	R4204

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼ANT C
C TNA▲G
Storage Conditions: Store at –20°C.

HpaI

Product	Size	Conc.	Cat.#
HpaI	100 u	3–10 u/µl	R6301
	500 u	3–10 u/µl	R6305

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GTT▼AAC
CAA▲TTG
Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

HpaII

Product	Size	Conc.	Cat.#
HpaII	1,000 u	10 u/µl	R6311
	5,000 u	10 u/µl	R6315

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
C▼CG G
G GC▲C
Storage Conditions: Store at –20°C.

Hsp92I

Product	Size	Conc.	Cat.#
Hsp92I	500 u	10 u/µl	R7151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G(A/G)▼CG (T/C)C
C(T/C) GC▲(A/G)G
Storage Conditions: Store at –20°C.

Hsp92II

Product	Size	Conc.	Cat.#
Hsp92II	1,000 u	10 u/µl	R7161

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CATG▼
▲GTAC
Storage Conditions: Store at –20°C.

I-PpoI (Intron-Encoded Endonuclease)

Product	Size	Conc.	Cat.#
I-PpoI	10,000 u	100–200 u/µl	R7031

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CTCTC TTAA▼GGTAGC
GAGAG▲AATT CCATCG
Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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KpnI

Product	Size	Conc.	Cat.#
KpnI	2,500 u	8–12 u/µl	R6341
	10,000 u	8–12 u/µl	R6345
KpnI (HC)	12,500 u	40–80 u/µl	R4344

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

G GTAC▼C

C▲CATG G

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

MboI

Product	Size	Conc.	Cat.#
MboI	200 u	8–12 u/µl	R6711

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

▼GATC

CTAG▲

Storage Conditions: Store at –20°C.

MboII

Product	Size	Conc.	Cat.#
MboII	100 u	2–10 u/µl	R6723

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

GAAGA$(N)_8$▼

CTTCT$(N)_7$▲

Storage Conditions: Store at –20°C.

MluI

Product	Size	Conc.	Cat.#
MluI	1,000 u	10 u/µl	R6381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

A▼CGCG T

T GCGC▲A

Features:

- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

MspA1I

Product	Size	Conc.	Cat.#
MspA1I	1,000 u	10 u/µl	R7021

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

C(A/C)G▼C(G/T)G

G(T/G)C▲G(C/A)C

Storage Conditions: Store at –20°C.

MspI

Product	Size	Conc.	Cat.#
MspI	2,000 u	10 u/µl	R6401
	10,000 u	10 u/µl	R6405
MspI (HC)	10,000 u	40–80 u/µl	R4404

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

C▼CG G

G GC▲C

Storage Conditions: Store at –20°C.

NarI

Product	Size	Conc.	Cat.#
NarI	200 u	10 u/µl	R6861

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

GG▼ CG CC

CC GC▲GG

Storage Conditions: Store at –20°C.

NciI

Product	Size	Conc.	Cat.#
NciI	1,000 u	10 u/µl	R7061

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

CC▼(C/G) GG

GG (G/C)▲CC

Storage Conditions: Store at –20°C.

NcoI

Product	Size	Conc.	Cat.#
NcoI	200 u	10 u/µl	R6513
	1,000 u	10 u/µl	R6515

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

C▼CATG G

G GTAC▲C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

NdeI

Product	Size	Conc.	Cat.#
NdeI	500 u	10 u/µl	R6801

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

CA▼TA TG

GT AT▲AC

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

NheI

Product	Size	Conc.	Cat.#
NheI	250 u	10 u/µl	R6501
	1,250 u	10 u/µl	R6505

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

G▼CTAG C

C GATC▲G

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

NotI

Product	Size	Conc.	Cat.#
NotI	200 u	10 u/µl	R6431
	1,000 u	10 u/µl	R6435
NotI (HC)	1,000 u	40–80 u/µl	R4434

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

GC▼GGCC GC

CG CCGG▲CG

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

NruI

Product	Size	Conc.	Cat.#
NruI	200 u	10 u/µl	R7091

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

TCG▼CGA

AGC▲GCT

Storage Conditions: Store at –20°C.

NsiI

Product	Size	Conc.	Cat.#
NsiI	250 u	10 u/µl	R6531

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

A TGCA▼T

T▲ACGT A

Features:

- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

PstI

Product	Size	Conc.	Cat.#
PstI	3,000 u	10 u/µl	R6111
	15,000 u	10 u/µl	R6115

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

C TGCA▼G

G▲ACGT C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

PvuI

Product	Size	Conc.	Cat.#
PvuI	100 u	2–10 u/µl	R6321
	500 u	2–10 u/µl	R6325

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

CG AT▼CG

GC▲TA GC

Features:

- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

PvuII

Product	Size	Conc.	Cat.#
PvuII	1,000 u	8–12 u/µl	R6331
	5,000 u	8–12 u/µl	R6335

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

CAG▼CTG

GTC▲GAC

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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RsaI

Product	Size	Conc.	Cat.#
RsaI	1,000 u	10 u/µl	R6371
RsaI (HC)	5,000 u	40–80 u/µl	R4374

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GT▼AC
CA▲TG
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

SacI

Product	Size	Conc.	Cat.#
SacI	1,000 u	10 u/µl	R6061
	5,000 u	10 u/µl	R6065
SacI (HC)	5,000 u	40–80 u/µl	R4064

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G AGCT▼C
C▲TCGA G
Storage Conditions: Store at –20°C.

SacII

Product	Size	Conc.	Cat.#
SacII	500 u	10 u/µl	R6221

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CC GC▼GG
GG▲CG CC
Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

SalI

Product	Size	Conc.	Cat.#
SalI	2,000 u	10 u/µl	R6051
	10,000 u	10 u/µl	R6055
SalI (HC)	10,000 u	40–80 u/µl	R4054

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G▼TCGA C
C AGCT▲G
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

Sau3AI

Product	Size	Conc.	Cat.#
Sau3AI	100 u	3–10 u/µl	R6191
	500 u	3–10 u/µl	R6195

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
▼GATC
CTAG▲
Storage Conditions: Store at –20°C.

ScaI

Product	Size	Conc.	Cat.#
ScaI	1,000 u	8–12 u/µl	R6211
ScaI (HC)	5,000 u	40–80 u/µl	R4214

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AGT▼ACT
TCA▲TGA
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

SfiI

Product	Size	Conc.	Cat.#
SfiI	250 u	10 u/µl	R6391
SfiI (HC)	1,250 u	40–80 u/µl	R4394

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GGCCN NNN▼NGGCC
CCGGN▲NNN NCCGG
Storage Conditions: Store at –20°C.

SgfI

Product	Size	Conc.	Cat.#
SgfI	250 u	8–12 u/µl	R7103
SgfI (HC)	1,250 u	40–80 u/µl	R5104

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
GCG AT▼CGC
CGC▲TA GCG
Storage Conditions: Store at –20°C. **Do not freeze.**

SmaI

Product	Size	Conc.	Cat.#
SmaI	1,000 u	8–12 u/µl	R6121
	5,000 u	8–12 u/µl	R6125
SmaI (HC)	5,000 u	40–80 u/µl	R4124

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
CCC▼GGG
GGG▲CCC
Storage Conditions: Store at –20°C.

SnaBI

Product	Size	Conc.	Cat.#
SnaBI	100 u	2–10 u/µl	R6791
	500 u	2–10 u/µl	R6795

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
TAC▼GTA
ATG▲CAT
Storage Conditions: Store at –20°C.

SpeI

Product	Size	Conc.	Cat.#
SpeI	200 u	10 u/µl	R6591
	1,000 u	10 u/µl	R6595

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
A▼CTAG T
T GATC▲A
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

SphI

Product	Size	Conc.	Cat.#
SphI	200 u	10 u/µl	R6261
	1,000 u	10 u/µl	R6265

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
G CATG▼C
C▲GTAC G
Features:
- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

SspI

Product	Size	Conc.	Cat.#
SspI	500 u	10 u/µl	R6601
SspI (HC)	2,500 u	40–80 u/µl	R4604

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AAT▼ATT
TTA▲TAA
Storage Conditions: Store at –20°C.

StuI

Product	Size	Conc.	Cat.#
StuI	400 u	10 u/µl	R6421

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AGG▼CCT
TCC▲GGA
Features:
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

TaqI

Product	Size	Conc.	Cat.#
TaqI	1,000 u	10 u/µl	R6151
	10,000 u	10 u/µl	R6155
TaqI (HC)	5,000 u	40–80 u/µl	R4154

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
T▼CG A
A GC▲T
Storage Conditions: Store at –20°C.

Tru9I

Product	Size	Conc.	Cat.#
Tru9I	200 u	8–12 u/µl	R7011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
T▼TA A
A AT▲T
Storage Conditions: Store at –20°C.

VspI

Product	Size	Conc.	Cat.#
VspI	500 u	8–12 u/µl	R6851

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:
AT▼TA AT
TA AT▲TA
Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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XbaI

Product	Size	Conc.	Cat.#
XbaI	2,000 u	8–12 u/µl	R6181
	10,000 u	8–12 u/µl	R6185
XbaI (HC)	10,000 u	40–80 u/µl	R4184

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

T▼CTAG A

A GATC▲T

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

XhoI

Product	Size	Conc.	Cat.#
XhoI	3,000 u	10 u/µl	R6161
	10,000 u	10 u/µl	R6165
XhoI (HC)	15,000 u	40–80 u/µl	R4164

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

C▼TCGA G

G AGCT▲C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.
- **GoTaq® Buffer Compatible:** Active and capable of digestion directly in GoTaq® Green Master Mix.

Storage Conditions: Store at –20°C.

XmaI

Product	Size	Conc.	Cat.#
XmaI	50 u	1–5 u/µl	R6491
	250 u	1–5 u/µl	R6495

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

C▼CCGG G

G GGCC▲C

Features:

- **Rapid Digest Capable:** Capable of digesting DNA in 15 minutes or less.

Storage Conditions: Store at –20°C.

XmnI

Product	Size	Conc.	Cat.#
XmnI	500 u	10 u/µl	R7271
	2,500 u		R7273

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

GAANN▼NNT TC

CT TNN▲NNAAG

Storage Conditions: Store at –20°C.

MULTI-CORE™ Buffer Pack

Product	Size	Cat.#
MULTI-CORE™ Buffer Pack	3 × 1 ml	R9991

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

The MULTI-CORE™ Buffer Pack contains convenient aliquots of the Promega universal restriction enzyme 10X buffer. The MULTI-CORE™ Buffer is formulated to provide simple buffering conditions for performing multiple digestions. Many Promega restriction enzymes have between 50% and 100% activity in reactions using MULTI-CORE™ Buffer.

Features:

- **Convenient and Economical:** MULTI-CORE™ Buffer enables co-digestion of DNA with more than one enzyme in a single reaction. In most cases, only modest adjustments in the amount of enzyme used will ensure complete multiple digestions.

Storage Conditions: Store at –20°C.

4-CORE® Buffer Pack

Product	Size	Cat.#
4-CORE® Buffer Pack (Buffers A, B, C and D), 1ml each	4 ml	R9921

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

The 4-CORE® Buffer Pack contains convenient aliquots of Promega Restriction Enzyme 10X Buffers A, B, C and D. The majority of Promega restriction enzymes have optimal activity in one of these four 10X reaction buffers.

Storage Conditions: Store at –20°C.

Alkaline Phosphatases

Alkaline Phosphatase, Calf Intestinal (CIAP)

Product	Size	Conc.	Cat.#
Alkaline Phosphatase, Calf Intestinal	1,000 u	1 u/µl	M1821
Alkaline Phosphatase, Calf Intestinal (HC)	1,000 u	20 u/µl	M2825
Available Separately		**Size**	**Cat.#**
CIAP Buffer Pack		1.5 ml	M1833

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Alkaline Phosphatase, Calf Intestinal (CIAP), catalyzes the hydrolysis of 5′-phosphate groups from DNA, RNA, and ribo- and deoxyribonucleoside triphosphates. This enzyme is used to prevent recircularization and religation of linearized cloning vector DNA by removing phosphate groups from both 5′-termini and may also be used for the dephosphorylation of 5′ phosphorylated ends of DNA or RNA for subsequent labeling with [^{32}P]ATP and T4 Polynucleotide Kinase. CIAP is active on 5′ overhangs, 5′ recessed and blunt ends.

Features:

- **Available at High Concentration:** Cat.# M2825 contains 1,000 units of CIAP at 20u/µl.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.
- **Provided with 10X Reaction Buffer:** 0.5M Tris-HCl (pH 9.3 at 25°C), 10mM $MgCl_2$, 1mM $ZnCl_2$, 10mM spermidine.

Storage Conditions: Store at –20°C.

TSAP Thermosensitive Alkaline Phosphatase

Product	Size	Cat.#
TSAP Thermosensitive Alkaline Phosphatase	100 units	M9910

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: TSAP Thermosensitive Alkaline Phosphatase catalyzes the removal of 5′ phosphate groups from DNA, thus preventing the recircularization and religation of linearized cloning vector DNA during ligation. It is effective on 3′ overhangs, 5′ overhangs and blunt ends. It is also useful for preparing DNA for 5′ end-labeling by removing existing phosphate groups from the 5′ end.

TSAP is irreversibly inactivated by heating at 74°C for 15 minutes. Therefore, a DNA cleanup step is not required before proceeding to a ligation reaction. TSAP is fully active in all restriction enzyme reaction buffers tested under the conditions listed below, facilitating a streamlined restriction digestion, dephosphorylation and ligation reaction.

Features:

- **Easy To Use:** TSAP is active in all Promega restriction enzyme buffers, eliminating any cleanup steps or buffer swaps.
- **Convenient:** TSAP is irreversibly inactivated by heating at 74°C for 15 minutes. This allows streamlining of the restriction enzyme digestion, dephosphorylation and ligation procedure by eliminating the need for cleanup after alkaline phosphatase treatment.
- **Blue/White Cloning-Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.
- **Provided with Promega MULTI-CORE™ Buffer.**

Storage Conditions: Store at –20°C. See the expiration date on the label.

Comparison of Alkaline Phosphatases.

	TSAP	CIAP*
Heat Inactivated	Yes	No
Inactivation Temperature	74	N/A
Incubation Time	15 min	2 × 30 min
Special Buffer Required/Recommended	No	Yes
Active in all Promega Restriction Enzyme Buffers	Yes	No
Units required in different RE Buffers	1–2	N/A
Blue/White Cloning-Qualified	Yes	Yes

Only TSAP does not require a special buffer and is active in all Promega restriction enzyme buffers, making it the most convenient and cost-effective choice.

CIAP = Calf Intestinal Alkaline Phosphatase

9493LA

Available in the Helix® on-site stocking system

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Polymerases

DNA Polymerase I

Product	Size	Conc.	Cat.#
DNA Polymerase I	500 u	5–10 u/µl	M2051
	2,500 u	5–10 u/µl	M2055

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: DNA Polymerase I catalyzes the template-directed polymerization of nucleotides into duplex DNA in a 5′→3′ direction. DNA Polymerase I possesses a 3′→5′ exonuclease activity or "proofreading" function, which lowers the error rate during DNA replication, and also contains a 5′→3′ exonuclease activity, which enables the enzyme to replace nucleotides in the growing strand of DNA by nick translation. The enzyme, purified from recombinant *E. coli*, is capable of catalyzing de novo synthesis of synthetic homopolymers and provides a convenient method for the preparation of a variety of defined DNA substrates.

Features:

- **Flexible:** DNA Polymerase I may be used in a variety of molecular applications.
- **May Be Heat-Inactivated:** DNA Polymerase I is inactivated by heating at 68°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.2 at 25°C), 100mM $MgSO_4$, 1mM DTT.

Storage Conditions: Store at –20°C.

DNA Polymerase I Large (Klenow) Fragment

Product	Size	Conc.	Cat.#
DNA Polymerase I Large (Klenow) Fragment	150 u	5 u/µl	M2201
	500 u	5 u/µl	M2206

For Laboratory Use.

Description: DNA Polymerase I Large (Klenow) Fragment is a DNA-dependent DNA polymerase that lacks the 5′→3′ exonuclease activity of intact *E. coli* DNA Polymerase I but retains its 5′→3′ polymerase, 3′→5′ exonuclease and strand displacement activities. The enzyme is a 68kDa C-terminal fragment of DNA Polymerase I. The 5′→3′ polymerase activity of Klenow Fragment can be used to fill in 5′-protruding ends with unlabeled or labeled dNTPs, to sequence single- or double-stranded DNA templates, for in vitro mutagenesis using synthetic oligonucleotides, for cDNA second-strand synthesis and to generate single-stranded DNA probes. The 3′→5′ exonuclease activity can be used to generate blunt ends from a 3′-overhang.

Features:

- **Flexible:** DNA Polymerase I Large (Klenow) Fragment may be used in a variety of molecular applications. It is also active in many Promega 1X restriction enzyme buffers.
- **May Be Heat-Inactivated:** DNA Polymerase I Large (Klenow) Fragment is inactivated by heating at 75°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.2 at 25°C), 100mM $MgSO_4$, 1mM DTT.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

DNA Polymerase I Large (Klenow) Fragment Mini Kit

Product	Size	Conc.	Cat.#
DNA Polymerase I Large (Klenow) Fragment Mini Kit	150 u		U1300
Available Separately	**Size**	**Conc.**	**Cat.#**
DNA Polymerase I Large (Klenow) Fragment	150 u	5 u/µl	M2201
Set of dATP, dCTP, dGTP, dTTP	10µmol each	100 mM	U1330

M2201, U1330 For Laboratory Use. U1300 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA Polymerase I Large (Klenow) Fragment Mini Kit provides a convenient combination of polymerase and dNTPs. The kit contains 5µmol each of dATP, dGTP, dTTP and dCTP (10mM in water) and DNA Polymerase I Large (Klenow) Fragment, ready for use in a variety of applications.

Features:

- **Convenient:** The kit provides DNA Polymerase I Large (Klenow) Fragment and dNTPs conveniently packaged and ready to use in your application.

Storage Conditions: Store at –20°C.

DNA Polymerase I Large (Klenow) Fragment, Exonuclease Minus

Product	Size	Conc.	Cat.#
Klenow Fragment, Exonuclease Minus	100 u	5–10 u/µl	M2181

For Laboratory Use.

Description:

DNA Polymerase I Large (Klenow) Fragment, Exonuclease Minus, is a DNA-dependent DNA polymerase that lacks both the 5′→3′ and the 3′→5′ exonuclease activities present in intact *E. coli* DNA Polymerase I. It is used for random primer labeling and in strand displacement amplification. Klenow Fragment, Exonuclease Minus, will leave a single-base 3′ overhang on a significant proportion of DNA fragments during fill-in of 5′-overhangs. Therefore, this enzyme is not recommended for preparation of blunt-ended fragments for ligation.

Features:

- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.2 at 25°C), 100mM $MgSO_4$, 1mM DTT.
- **May Be Heat-Inactivated:** DNA Polymerase I Large (Klenow) Fragment, Exonuclease Minus, is inactivated by heating at 75°C for 10 minutes.

Storage Conditions: Store at –20°C.

T4 DNA Polymerase

Product	Size	Conc.	Cat.#
T4 DNA Polymerase	100 u	5–10 u/µl	M4211
	500 u	5–10 u/µl	M4215

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

T4 DNA Polymerase catalyzes the 5′→3′ synthesis of DNA from a primed single-stranded DNA template. Although possessing a potent 3′→5′ proof-reading exonuclease, T4 DNA Polymerase contains no 5′→3′ exonuclease activity. T4 DNA Polymerase can be used to fill 5′ protruding ends with labeled or unlabeled dNTPs or for the generation of blunt ends from DNA molecules with 3′ overhangs.

Features:

- **High Fidelity:** T4 DNA Polymerase is the enzyme of choice for applications where misincorporation is a concern.
- **Flexible:** T4 DNA Polymerase may be used in a variety of molecular applications. Active in many Promega 1X restriction enzyme buffers.
- **May Be Heat-Inactivated:** T4 DNA Polymerase is inactivated by heating at 75°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 250mM Tris-acetate (pH 7.7), 1M potassium acetate, 100mM magnesium acetate and 10mM DTT.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

SP6 RNA Polymerase

Product	Size	Conc.	Cat.#
SP6 RNA Polymerase	1,000 u	10–20 u/µl	P1085
	5,000 u	10–20 u/µl	P1081
SP6 RNA Polymerase (HC)	2,500 u	80 u/µl	P4084

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SP6 RNA Polymerase is a DNA-dependent RNA polymerase that exhibits extremely high specificity for its cognate promoter sequences. Only SP6 DNA or DNA cloned downstream from an SP6 promoter can serve as a template for SP6 RNA Polymerase-directed RNA synthesis.

Features:

- **Specific:** SP6 RNA Polymerase exhibits extremely high affinity and specificity for SP6 promoter sequences.
- **Highly Pure:** SP6 RNA Polymerase is >90% pure as determined by SDS polyacrylamide gel electrophoresis. Free of detectable levels of contaminating RNase and DNase activity (<1% release).
- **Flexible:** Will incorporate ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleoside triphosphates.
- **Provided with 5X Reaction Buffer:** Provided with 100mM DTT and Transcription Optimized 5X Buffer: 200mM Tris-HCl (pH 7.9 at 25°C), 30mM $MgCl_2$, 10mM spermidine, 50mM NaCl.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

T3 RNA Polymerase

Product	Size	Conc.	Cat.#
T3 RNA Polymerase	1,000 u	10–20 u/µl	P2083
T3 RNA Polymerase (HC)	2,500 u	80 u/µl	P4024

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: T3 RNA Polymerase is a DNA-dependent RNA polymerase that exhibits extremely high specificity for its cognate promoter sequences. Only T3 DNA or DNA cloned downstream from a T3 promoter can serve as a template for T3 RNA Polymerase-directed RNA synthesis.

Features:

- **Specific:** T3 RNA Polymerase exhibits extremely high affinity and specificity for T3 promoter sequences.
- **Highly Pure:** T3 RNA Polymerase is >90% pure as determined by SDS polyacrylamide gel electrophoresis. Free of detectable levels of contaminating RNase and DNase activity (<1% release).
- **Flexible:** Will incorporate ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleoside triphosphates.
- **Provided with 5X Reaction Buffer:** Provided with 100mM DTT and Transcription Optimized 5X Buffer: 200mM Tris-HCl (pH 7.9 at 25°C), 30mM $MgCl_2$, 10mM spermidine, 50mM NaCl.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

T7 RNA Polymerase

Product	Size	Conc.	Cat.#
T7 RNA Polymerase	1,000 u	10–20 u/µl	P2075
	5,000 u	10–20 u/µl	P2077
T7 RNA Polymerase (HC)	10,000 u	80 u/µl	P4074

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: T7 RNA Polymerase is a DNA-dependent RNA polymerase that exhibits extremely high specificity for its cognate promoter sequences. Only T7 DNA or DNA cloned downstream from a T7 promoter can serve as a template for T7 RNA Polymerase-directed RNA synthesis.

Features:

- **Specific:** T7 RNA Polymerase exhibits extremely high affinity and specificity for T7 promoter sequences.
- **Highly Pure:** T7 RNA Polymerase is judged to be greater than 90% pure as determined by SDS polyacrylamide gel electrophoresis. Free of detectable levels of contaminating RNase and DNase activity (<1% release).
- **Flexible:** Will incorporate ^{32}P, ^{33}P, ^{3}H and ^{35}S nucleoside triphosphates.
- **Provided with 5X Reaction Buffer:** Provided with 100mM DTT and Transcription Optimized 5X Buffer: 200mM Tris-HCl (pH 7.9 at 25°C), 30mM $MgCl_2$, 10mM spermidine, 50mM NaCl.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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RNA Polymerase Promoter Sequencing Primers

Product	Size	Conc.	Cat.#
SP6 Promoter Primer	2 µg	10 µg/ml	Q5011
T7 Promoter Primer	2 µg	10 µg/ml	Q5021
T7 EEV Promoter Primer	2 µg	10 µg/ml	Q6700

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SP6 and T7 Promoter Primers are designed for sequencing inserts cloned into the pGEM® Vectors. The SP6 Promoter Primer is designed for sequencing inserts cloned into the pALTER®-MAX and pCI-neo Vectors. The primers are designed to be annealed to single-stranded DNA or, after alkaline denaturation, to double-stranded DNA. The promoter primers are purified by gel electrophoresis or HPLC. The T7 EEV Promoter Primer is suitable for sequencing the pALTER®-MAX, pCMVT$_{NT}$™, pT$_{NT}$™ and phMGFP Vectors, and the pCI/pSI series of mammalian expression vectors.

Primer Sequences

- SP6: 5´-d(TATTTAGGTGACACTATAG)-3´
- T7: 5´-d(TAATACGACTCACTATAGGG)-3´
- T7 EEV: 5´-d(AAGGCTAGAGTACTTAATACGA)-3´

Storage Conditions: Store at –20°C.

Ligases

LigaFast™ Rapid DNA Ligation System

Product	Size	Cat.#
LigaFast™ Rapid DNA Ligation System	30 reactions	M8221
	150 reactions	M8225
Available Separately	**Size**	**Cat.#**
2X Rapid Ligation Buffer	1.5 ml	C6711

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

The LigaFast™ Rapid DNA Ligation System is designed for the efficient ligation of sticky-ended DNA inserts into plasmid vectors in just 5 minutes (blunt-ended inserts in as little as 15 minutes). Rapid ligation is based on the combination of T4 DNA Ligase with a unique 2X Rapid Ligation Buffer. The LigaFast™ System is designed to eliminate any further purification prior to transformation of ligated DNA. The specially formulated 2X Rapid Ligation Buffer requires no additional ATP or Mg^{2+} addition prior to use.

Features:

- **Flexible:** Use with 5´, 3´ or blunt-ended DNA inserts.
- **Fast:** Ligation of cohesive ends in 5 minutes, blunt ends in 15 minutes at room temperature.
- **Convenient:** No requirement to purify ligated DNA prior to heat-shock transformation in *E. coli*. Ligations conducted at room temperature.
- **Ready-To-Use:** No additional buffer modifications required prior to use.
- **Efficient:** Ligations performed using the LigaFast™ System are comparable to standard overnight ligations.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.

Storage Conditions: Store at –20°C.

T4 DNA Ligase

Product	Size	Conc.	Cat.#
T4 DNA Ligase	100 u	1–3 u/µl	M1801
	500 u	1–3 u/µl	M1804
T4 DNA Ligase (HC)	500 u	10–20 u/µl	M1794
Available Separately		**Size**	**Cat.#**
T4 DNA Ligase Buffer Pack		1.5 ml	C1263

C1263 For Research Use Only. Not for Use in Diagnostic Procedures. M1801, M1804, M1794 For Laboratory Use.

Description: T4 DNA Ligase catalyzes the joining of two strands of DNA between the 5´-phosphate and the 3´-hydroxyl groups of adjacent nucleotides in either a cohesive-ended or blunt-ended configuration. The enzyme has also been shown to catalyze the joining of RNA to either a DNA or RNA strand in a duplex molecule but will not join single-stranded nucleic acids.

The T4 DNA Ligase Buffer Pack includes 3 tubes of T4 DNA Ligase 10X Reaction Buffer. The composition of the 10X reaction buffer is 300mM Tris-HCl (pH 7.8 at 25°C), 100mM $MgCl_2$, 100mM DTT and 10mM ATP.

Features:

- **Available at High Concentration:** Cat.# M1794 contains 500 units of T4 DNA Ligase at 10–20u/µl.
- **Flexible:** Use with 5´, 3´ or blunt-ended DNA inserts.
- **Provided with 10X Reaction Buffer:** 300mM Tris-HCl (pH 7.8 at 25°C), 100mM $MgCl_2$, 100mM DTT and 10mM ATP.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

T4 RNA Ligase

Product	Size	Conc.	Cat.#
T4 RNA Ligase	500 u	10 u/µl	M1051

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: T4 RNA Ligase catalyzes the ATP-dependent ligation of single-stranded RNA or DNA onto the 5´-phosphoryl termini of single-stranded RNA or DNA. The enzyme, purified from recombinant *E. coli* CA4 (RNase I-deficient), has an apparent molecular weight of 43.5kDa. T4 RNA Ligase also catalyzes the addition of [5´-^{32}P] nucleoside 3´,5´-bis (phosphate) onto single-stranded RNA.

Features:

- **May Be Heat-Inactivated:** T4 RNA Ligase may be inactivated by heating at 65°C for 15 minutes.
- **Provided with 10X Reaction Buffer:** 500mM Tris-HCl (pH 7.8 at 25°C), 100mM $MgCl_2$, 50mM DTT, 10mM ATP.

Storage Conditions: Store at –20°C.

Kinases and DNA Labeling Systems

T4 Polynucleotide Kinase

Product	Size	Conc.	Cat.#
T4 Polynucleotide Kinase	100 u	5–10 u/µl	M4101
	1,000 u	5–10 u/µl	M4103
Available Separately	**Size**		**Cat.#**
T4 PNK Buffer Pack	1.5 ml		C1313

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: T4 Polynucleotide Kinase catalyzes the transfer of the γ-phosphate from ATP to the 5′-terminus of polynucleotides or to mononucleotides bearing a 5′-hydroxyl group. The enzyme, purified from recombinant *E. coli*, may be used to phosphorylate RNA, DNA and synthetic oligonucleotides prior to subsequent manipulations such as ligation.

Features:

- **May Be Heat-Inactivated:** T4 Polynucleotide Kinase may be inactivated by heating at 68°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 700mM Tris-HCl (pH 7.6 at 25°C), 100mM $MgCl_2$, 50mM DTT.
- **Blue/White Cloning Qualified:** Promega's blue/white cloning assay provides a higher level of quality control for enzymes used in cloning applications.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

DNA 5′ End-Labeling System

Product	Size	Cat.#
DNA 5′ End-Labeling System	10 reactions	U2010

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA 5′ End-Labeling System is a complete system for phosphorylating both double- and single-stranded DNA and RNA with T4 Polynucleotide Kinase and [γ-^{32}P]ATP. The system includes enzymes, buffers and control DNA standards to measure reaction efficiencies. Calf Intestinal Alkaline Phosphatase is included for removal of the 5′-phosphate prior to labeling with T4 Polynucleotide Kinase.

Features:

- **Convenient:** Can use to label both single-stranded and double-stranded DNA and RNA.
- **Complete:** System includes enzymes, buffers and control DNA standards for measuring reaction efficiencies (except radionucleotides).
- **Flexible:** Works with [γ-^{32}P]ATP, [γ-^{33}P]ATP or [γ-^{35}S]ATP.

Storage Conditions: Store at –20°C.

Prime-a-Gene® Labeling System

Product	Size	Cat.#
Prime-a-Gene® Labeling System	30 reactions	U1100
Available Separately	**Size**	**Cat.#**
Nuclease-Free Water	150 ml	P1195
Labeling 5X Buffer	300 µl	U1151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Prime-a-Gene® Labeling System provides a complete set of complementary reagents, including Labeling 5X Buffer that contains random synthetic hexadeoxynucleotide primers for random-primed labeling of linear template DNA with radionucleotides. As little as 25ng of input DNA can be used to generate probes with specific activities >1 × 10^9cpm/µg.

Features:

- **Ready to Use:** Includes reagents needed for random-primed labeling of linear DNA, including random synthetic hexadeoxynucleotide primers (excluding radionucleotides).
- **High Specific Activity:** Probes with specific activities >1 × 10^9cpm/µg can be generated.

Storage Conditions: Store at –20°C.

Nucleases

Exonuclease III

Product	Size	Conc.	Cat.#
Exonuclease III	5,000 u	150–200 u/µl	M1811
	25,000 u	150–200 u/µl	M1815

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Exonuclease III is a 3′→5′ exonuclease specific for double-stranded DNA. The enzyme catalyzes the stepwise removal of mononucleotides starting from a 3′-OH at nicks, blunt ends, recessed ends and 3′-overhangs of less than 4 bases, yielding nucleoside 5′-phosphates. Exonuclease III will also degrade DNA from 3′-phosphate ends due to its intrinsic 3′-phosphatase activity. In addition, the enzyme has apurinic endonuclease activity and ribonuclease H activity. Exonuclease III is used in conjunction with S1 nuclease for unidirectional deletion of sequences from the termini of DNA fragments.

Features:

- **Flexible:** Control deletion rate by varying incubation temperature.
- **May Be Heat-Inactivated:** Exonuclease III may be inactivated by heating to 75°C for 10 minutes.
- **Provided with 10X Reaction Buffer:** 660mM Tris-HCl (pH 8.0 at 25°C), 6.6mM $MgCl_2$.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Erase-a-Base™ System

Product	Size	Cat.#
Erase-a-Base™ System (minus vectors & bacterial strain)	1 system	E5750

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Erase-a-Base™ System is designed for the rapid construction of plasmid or M13 subclones containing progressive unidirectional deletions of any inserted DNA. The system is based on the procedure developed by Henikoff, in which exonuclease III (Exo III) is used to specifically digest insert DNA from a 5′ protruding or blunt end restriction site. The adjacent sequencing primer binding site is protected from digestion by a 4-base 3′ overhang restriction site or by an α-phosphorothioate-filled end.

Features:

- **Rapid:** Construction of nested deletions from plasmid or M13 clones are rapid. Construction is complete in a few hours.
- **Efficient:** Produce deletion sets spanning several kilobases.

Storage Conditions: Store at –20°C.

Mung Bean Nuclease

Product	Size	Conc.	Cat.#
Mung Bean Nuclease	2,000 u	50–100 u/µl	M4311

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Mung Bean Nuclease catalyzes the degradation of single-stranded DNA and RNA endonucleolytically to yield 5′-phosphoryl-terminated products. While the nuclease prefers ssDNA over dsDNA by 30,000-fold, at very high concentrations the enzyme degrades double-stranded DNA from both ends. Mung Bean Nuclease has been used for transcript mapping studies, for flushing staggered ends and for the separation of cDNA strands after synthesis with reverse transcriptase and DNA Polymerase I.

Features:

- **Provided with 10X Reaction Buffer:** 300mM sodium acetate (pH 5.0 at 15°C), 500mM NaCl, 10mM $ZnCl_2$.

Storage Conditions: Store at –20°C.

Ribonuclease H

Product	Size	Conc.	Cat.#
Ribonuclease H	50 u	0.5–2 u/µl	M4281
	250 u	0.5–2 u/µl	M4285

For Laboratory Use.

Description: Ribonuclease H (RNase H) is an endonuclease that specifically hydrolyzes the phosphodiester bonds of RNA hybridized to DNA to produce 3′-OH and 5′-P-terminated products. It will not degrade single-stranded nucleic acids, double-stranded DNA or double-stranded RNA.

Storage Conditions: Store at –20°C.

RNase ONE™ Ribonuclease

Product	Size	Conc.	Cat.#
RNase ONE™ Ribonuclease	1,000 u	5–10 u/µl	M4261
	5,000 u	5–10 u/µl	M4265

For Laboratory Use.

Description: RNase ONE™ Ribonuclease is a 27kDa periplasmic enzyme from *E. coli* that catalyzes the degradation of RNA to cyclic nucleotide monophosphate (NMP) intermediates. Slower hydrolysis further catalyzes the degradation of these intermediates to 3′-NMPs. RNase ONE™ Ribonuclease is one of the few known RNases that can cleave a phosphodiester bond between any two ribonucleotides. RNase ONE™ Ribonuclease may be used to remove RNA from DNA preparations, for RNase protection assays and for mapping or quantitation of RNA by selective cleavage of single-stranded regions.

Features:

- **Flexible:** RNase ONE™ Ribonuclease has the ability to cleave phosphodiester bonds between any two ribonucleotides.
- **Provided with 10X Reaction Buffer:** 100mM Tris-HCl (pH 7.5 at 25°C), 50mM EDTA, 2M sodium acetate.

Storage Conditions: Store at –20°C. **Do not freeze at –70°C. Do not store on dry ice.**

RQ1 RNase-Free DNase

Product	Size	Conc.	Cat.#
RQ1 RNase-Free DNase	1,000 u	1 u/µl	M6101

For Laboratory Use.

Description: RQ1 RNase-Free DNase is a preparation of deoxyribonuclease I that degrades single-stranded or double-stranded DNA to produce 3′-hydroxyl oligonucleotides. This preparation is qualified for use in applications where maintaining the integrity of RNA is critical.

Features:

- **Convenient:** 10X Reaction Buffer (400mM Tris-HCl [pH 8.0 at 25°C], 100mM $MgSO_4$, 10mM $CaCl_2$) and Stop Buffer (20mM EGTA [pH 8.0 at 25°C]) are provided.

Storage Conditions: Store at –20°C.

S1 Nuclease

Product	Size	Conc.	Cat.#
S1 Nuclease	10,000 u	20–100 u/µl	M5761

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: S1 Nuclease degrades single-stranded DNA and RNA endonucleolytically to yield 5′-phosphoryl-terminated products. Double-stranded nucleic acids (DNA:DNA, DNA:RNA or RNA:RNA) are resistant to degradation except with extremely high concentrations of enzyme. The enzyme is used to remove single-stranded termini from double-stranded DNA, for selective cleavage of single-stranded DNA and for mapping RNA transcripts.

Features:

- **Provided with 10X Reaction Buffer:** 0.5M sodium acetate (pH 4.5 at 25°C), 2.8M NaCl, 45mM $ZnSO_4$.

Storage Conditions: Store at –20°C.

Additional Enzymes

Single-Stranded DNA Binding Protein

Product	Size	Conc.	Cat.#
Single-Stranded DNA Binding Protein	100 µg	1–5 µg/µl	M3011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: *E. coli* Single-Stranded DNA Binding Protein (SSB) consists of four identical 18.9kDa subunits. It binds with high affinity in a cooperative manner to single-stranded DNA but does not bind well to double-stranded DNA. It is involved in DNA replication and in recombination in vivo.

Storage Conditions: Store at –20°C.

Terminal Deoxynucleotidyl Transferase, Recombinant

Product	Size	Conc.	Cat.#
Terminal Deoxynucleotidyl Transferase, Recombinant	300 u	30 u/µl	M1871
	1,500 u	30 u/µl	M1875
Available Separately	**Size**		**Cat.#**
Terminal Transferase Buffer Pack	3 × 500 µl		M1893

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Terminal Deoxynucleotidyl Transferase, Recombinant, catalyzes the repetitive addition of mononucleotides to the terminal 3´-OH of a DNA initiator accompanied by the release of inorganic phosphate. Single-stranded DNA is preferred as an initiator. Polymerization is not template-dependent. The addition of 1mM Co^{2+} (as $CoCl_2$) in the reaction buffer allows the tailing of 3´-ends with varying degrees of efficiency.

Features:

- **Tails Any Type of 3´ End:** The presence of 1mM $CoCl_2$ in the reaction buffer allows the tailing of any type of 3´ end (3´ and 5´ overhangs or blunt ends).
- **Tested for Apoptotic DNA Labeling:** Each lot of enzyme is qualified for success in the procedure outlined in the *DeadEnd™ Fluorometric TUNEL System Technical Bulletin* #TB235.
- **Provided with 5X Reaction Buffer:** 500mM cacodylate buffer (pH 6.8 at 25°C), 5mM $CoCl_2$, 0.5mM DTT.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Topoisomerase I

Product	Size	Conc.	Cat.#
Topoisomerase I	200 u	2–10 u/µl	M2851

For Research Use Only. Not for Use in Diagnostic Procedures.

Description:

Topoisomerase I, isolated from wheat germ, is an enzyme capable of removing negative supercoils from covalently closed circular DNA.

Storage Conditions: Store at –70°C.

Ribonuclease Inhibitors

RNasin® Plus RNase Inhibitor

Product	Size	Conc.	Cat.#
RNasin® Plus RNase Inhibitor	2,500 u	40 u/µl	N2611
	10,000 u	40 u/µl	N2615

For Laboratory Use.

Description: RNasin® Plus RNase Inhibitor is a recombinant mammalian RNase inhibitor that is expressed as a soluble protein in *E. coli*, allowing easy purification through a combination of ion exchange and hydrophobic interaction chromatography. The protein is capable of inhibiting eukaryotic RNases (e.g., RNase A and RNase B) similarly to human placental RNase inhibitor. RNasin® Plus RNase Inhibitor is tested in RT-PCR and is compatible with enzymes such as AMV, M-MLV and ImProm-II™ Reverse Transcriptases or *Taq* and *Tfl* DNA Polymerases. RNasin® Plus RNase Inhibitor also is tested and compatible with quantitative, real-time RT-PCR in a TaqMan® assay.

The inhibitor offers increased resistance to oxidation over the human version of the protein. Two cysteines in the human protein have been identified as especially sensitive to oxidation and react by forming a disulfide bond that can block the active site of the inhibitor. RNasin® Plus, through natural amino acid diversity, lacks the ability to form this site-blocking disulfide. In addition, the new protein has characteristics never before realized, including continued inhibition of RNases above 50°C. Heating solutions of RNasin® Plus and RNase followed by cooling does not result in the reappearance of RNase activity—even when the solution is heated above the denaturation temperature of the RNasin® Plus protein alone. This allows RNasin® Plus to protect RNA species prior to, during and after heating, even at temperatures normally used during first-strand DNA synthesis in RT-PCR. We have taken solutions up to 70°C for 15 minutes and did not see RNase reactivation.

Features:

- **Improved Resistance to Oxidation:** Due to natural amino acid diversity, RNasin® Plus lacks the capability to form the active site-blocking disulfide bond that can form in the human protein under oxidative conditions.
- **Improved Purification:** RNasin® Plus is expressed by *E. coli* as a soluble protein, allowing easy purification by a combination of ion exchange and hydrophobic interaction chromatography. No direct affinity chromatography required. The new process yields a >90% pure protein with no *E. coli* RNase carryover.
- **Proven Compatibility with RT-PCR Systems:** RNasin® Plus has proven compatible with the Access and AccessQuick™ RT-PCR Systems, ImProm-II™ Reverse Transcription System and the Reverse Transcription System. Also proven compatible with TaqMan®-based RT-PCR Systems.
- **Protection During RNA Template Denaturation:** Heating mixtures of RNasin® Plus and RNase does not lead to reactivation of the RNase at temperatures even as high as 70°C for 15 minutes. Many RT-PCR protocols call for RNA template denaturation (e.g., 65–70°C for 5–10 minutes) in the presence of the RT primers prior to full RT reaction assembly for maximum sensitivity. You can now include RNasin® Plus at this step.
- **Protection During Higher Temperature RT Reactions:** Add RNasin® Plus during RT reaction assembly and take the reaction to temperatures above 50°C with enzymes like the ImProm-II™ and AMV Reverse Transcriptases. RNases that may be present will not be reactivated at the higher temperature.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Recombinant RNasin® Ribonuclease Inhibitor

Product	Size Conc.	Cat.#
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2511
	10,000 u 20–40 u/µl	N2515
For Laboratory Use.		

Description: RNases are ubiquitous, cause RNA degradation and can compromise RNA integrity. Recombinant RNasin® Inhibitor is a 50kDa protein that inhibits RNase A family and human placental RNases by noncovalently binding to RNases in a 1:1 ratio. Recombinant RNasin® Inhibitor does not inhibit RNase T1, S1 nuclease, RNase from *Aspergillus*, RNase H, RNase ONE™ Ribonuclease and enzymes for downstream applications such as GoScript™ Reverse Transcriptase, AMV/M-MLV reverse transcriptases, SP6, T7/T3 RNA polymerase, and *Taq* DNA polymerases. Learn more about our custom options for this product at: **www.promega.com/custom/**

Features:

- **Inhibits Common Eukaryotic RNases:** Carries broad-spectrum RNase inhibitory properties.
- **Compatible:** Does not inhibit SP6, T7 or T3 RNA Polymerase; GoScript™, AMV or M-MLV Reverse Transcriptase; or *Taq* DNA polymerase.
- **Broad pH Range (pH 5–8):** Offers flexibility in downstream assays.
- **Recombinantly Produced:** Minimizes chances of human nucleic acid contamination.

Storage Conditions: Store at –20°C.

Native RNasin® Ribonuclease Inhibitor

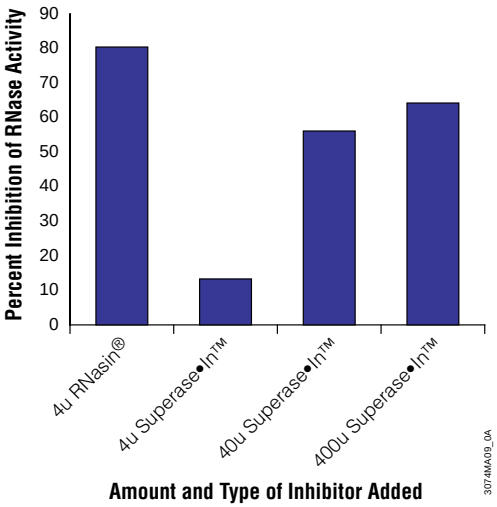
Product	Size Conc.	Cat.#
RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2111
	10,000 u 20–40 u/µl	N2115
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2511
	10,000 u 20–40 u/µl	N2515
N2111, N2115 For Research Use Only. Not for Use in Diagnostic Procedures. N2511, N2515 For Laboratory Use.		

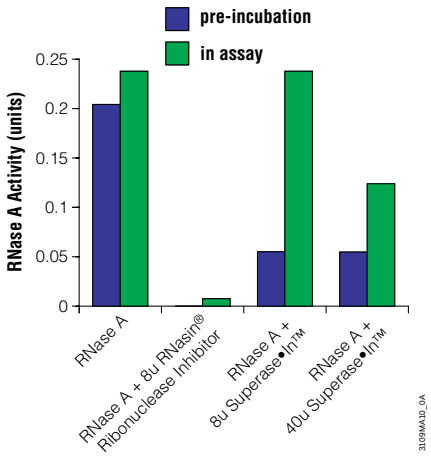
Description: Native RNasin® Inhibitor is a 50kDa protein that inhibits RNase A family and human placental RNases by noncovalently binding to RNases in a 1:1 ratio. Recombinant RNasin® Inhibitor does not inhibit RNase T1, S1 nuclease, RNase from *Aspergillus*, RNase H, RNase ONE™ Ribonuclease and enzymes for downstream applications such as GoScript™ Reverse Transcriptase, AMV/M-MLV reverse transcriptases, SP6, T7/T3 RNA polymerase and Taq DNA polymerases.

Features:

- **Inhibits Common Eukaryotic RNases:** Carries broad-spectrum RNase inhibitory properties.
- **Compatible:** Does not inhibit SP6, T7 or T3 RNA Polymerase; GoScript™, AMV or M-MLV Reverse Transcriptase; or *Taq* DNA polymerase.
- **Broad pH Range (pH 5–8):** Offers flexibility in downstream assays.

Storage Conditions: Store at –20°C.





Comparison of RNasin® Ribonuclease Inhibitor and Superase•In™ inhibition of RNase A activity. Panel A. Total yeast RNA assay. Total yeast RNA was incubated in the presence of 5ng RNase A for 5 minutes at 37°C in 0.5ml of reaction mix containing 50mM MOPS and 5mM $MgCl_2$ (pH 6.5). The indicated amounts of inhibitor (RNasin® or Superase•In™) were mixed with the RNA prior to RNase addition. After incubation, 0.5ml 10% TCA was added to stop the reaction and to precipitate the large RNA molecules. An OD_{280} measurement was taken of the TCA-soluble material. **Panel B**. "Pre-incubation" and "in assay" conditions. The total yeast RNA assay was performed as described in Panel A along with an experimental modification of "pre-incubation." For the pre-incubation assay, the ribonuclease inhibitors were mixed with RNase and incubated for 15 minutes at 22°C. The pre-incubation mix was then added to the RNA.

Subcloning Tools and Vectors

Subcloning Tools Bundle

Product	Size	Cat.#
Subcloning Tools Bundle	1 each	M1060

For Research Use Only. Not for Use in Diagnostic Procedures. Product may not be available in all countries. Please contact your local representative for more information.

Description: Speed your subcloning with these easy-to-use tools. Purchase the Subcloning Tools Bundle, and get LigaFast™ Rapid DNA Ligation System, TSAP Thermosensitive Alkaline Phosphatase, BenchTop 100bp DNA Ladder, Wizard® SV Gel and PCR Clean-Up System and PureYield™ Plasmid Miniprep System for one low price. It's like getting the PureYield™ Plasmid Miniprep System for free.

Features:

- **LigaFast™ Rapid DNA Ligation System:** Rapid room temperature ligations of vectors and inserts in as little as 5 minutes. Transform competent bacteria immediately following the reaction.
- **TSAP Thermosensitive Alkaline Phosphatase:** Use rapid protocol (included) to digest and dephosphorylate at the same time or use in standard application. Heat kill the enzyme after the reaction in 15 minutes. Active in common restriction enzyme buffers with no zinc requirement.
- **BenchTop 100bp DNA Ladder:** Ready-to-load marker for agarose gel electrophoresis. Use when gel purifying either vector or insert.
- **Wizard® SV Gel and PCR Clean-Up System:** Rapid gel purification of fragments for 100bp to 10kb. Great for removing enzymes from DNA as well. High-capacity and low elution volume.
- **PureYield™ Plasmid Miniprep System:** Rapid 10-minute miniprep. Prepare your vector for subcloning or use to screen for recombinants. Go from screening to transfection thanks to the high-quality DNA.

Storage Conditions: Store the LigaFast™ Rapid DNA Ligation System (M8221) and TSAP Thermosensitive Alkaline Phosphatase (M9910) at –20°C. Store the BenchTop 100bp DNA Ladder at 22–25°C; storage at –20°C can enhance the shelf life of this product. Store the Wizard® SV Gel and PCR Clean-Up System (A9281) and PureYield™ Plasmid Miniprep System (A1223) at 22–25°C.

Flexi® Cloning System

Product	Size	Cat.#
Flexi® System, Entry/Transfer	5 entry and 20 transfer reactions	C8640
Flexi® System, Transfer	100 transfer reactions	C8820
Carboxy Flexi® System, Transfer	50 transfer reactions	C9320
Available Separately	**Size**	**Cat.#**
10X Flexi® Enzyme Blend (SgfI & PmeI)	25 µl	R1851
	100 µl	R1852
Carboxy Flexi® Enzyme Blend (SgfI & EcoICRI)	50 µl	R1901
HaloTag® Cloning Starter System	1 each	G6050

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Flexi® Vector System is a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions without the need to resequence.

All Flexi® Vectors carry the lethal barnase gene, which is replaced by the DNA fragment of interest and acts as a positive selection for the successful ligation of the insert.

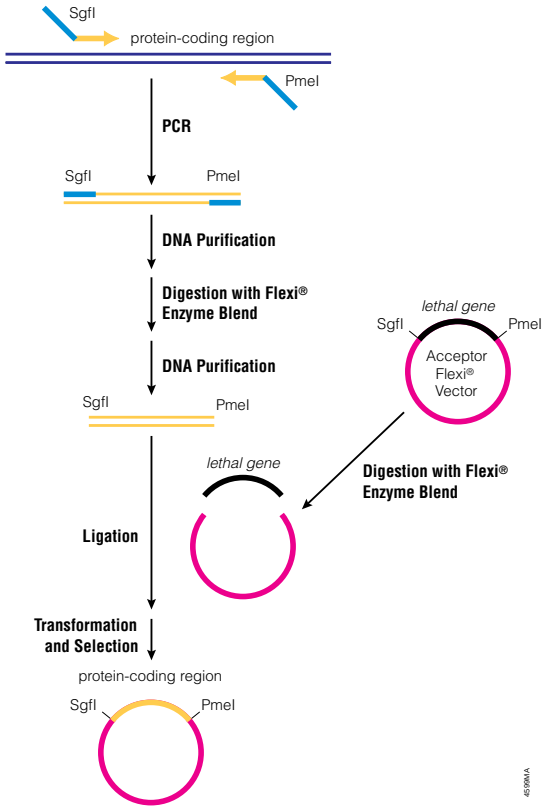
Unlike site-specific recombination vector systems, the Flexi® Vector Systems do not require appending multiple amino acids to the amino or carboxy termini of the protein of interest. In addition, the systems do not require an archival entry vector, and most applications allow direct entry into the vector suited to the experimental design.

C-terminal Flexi® Vectors allow expression of C-terminal-tagged proteins. While these vectors can act as acceptors of protein-coding regions flanked by SgfI and PmeI, they lack a PmeI site and contain a different blunt-ended site, EcoICRI. This joined sequence cannot be removed from the C-terminal Flexi® Vectors and transferred to other Flexi® Vectors.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Cat.# C8640 is comprised of Cat.# C8641 and A9280. Store Cat.# C8641 at –20°C; store Cat.# A9280 at room temperature. Store Cat.# C8820 and C9320 at –20°C. Store enzyme blends at –20°C.



Available in the Helix® on-site stocking system

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Untagged Flexi® Mammalian Expression Vectors

Product	Size	Cat.#
pF4A CMV Flexi® Vector	20 µg	C8481
pF4K CMV Flexi® Vector	20 µg	C8491
pF5A CMV-neo Flexi® Vector	20 µg	C9401
pF5K CMV-neo Flexi® Vector	20 µg	C9411
pF9A CMV *hRluc*-neo Flexi® Vector	20 µg	C9361

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are designed specifically for high-level expression of proteins in mammalian cells from the CMV promoter with or without a selectable marker. The pFN9A Vector provides *Renilla* luciferase, which may be used as a transfection control. The pFN9A Vector was designed to complement pGL4 firefly luciferase vectors when exogenous proteins (e.g., a receptor of transcription factor) must be expressed for reporter assays. All inserts may be confirmed by cell-free expression with the TNT® T7 Quick System (Cat.# L1170).

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows for direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

HaloTag® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pH6HTN His_6HaloTag® T7 Vector	20 µg	G7971
pH6HTC His_6HaloTag® T7 Vector	20 µg	G8031
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN19A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1891
pFN19K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1841
pFC20A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1681
pFC20K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1691
pFN29A His_6HaloTag® T7 Flexi® Vector	20 µg	G8261
pFN29K His_6HaloTag® T7 Flexi® Vector	20 µg	G8331
pFC30A His_6HaloTag® T7 Flexi® Vector	20 µg	G8321
pFC30K His_6HaloTag® T7 Flexi® Vector	20 µg	G8381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are used for inducible expression of HaloTag® fusion proteins in *E. coli* and cell-free systems using the T7 RNA polymerase promoter. Expression levels depend highly on the nature of the protein, but in general the N-terminal HaloTag® fusion protein (e.g., pFN18A/K, Cat.# G2751, G2681) can increase expression level, enhance refolding and boost solubility of the expressed protein. HaloTag® vectors are supplied in two formats: as multiple cloning site (MCS) vectors for traditional cloning and as Flexi® System vectors.

The Flexi® Vector System is a simple, directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence. Direct transfers can only occur between two N-terminal tagged vectors or from an N-terminal to a C-terminal vector. The MCS vectors and several Flexi® system vectors contain a His_6-HaloTag® dual tag. The dual tag enables protein purification with the reusable Ni-resin while retaining the HaloTag® covalent labeling properties.

Multiple Cloning Site (MCS) Vectors

pH6HTN His_6HaloTag® T7 Vector (Cat.# G7971) is designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

pH6HTC His_6HaloTag® T7 Vector (Cat.# G8031) is designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

Flexi® System Vectors

pF1A/K T7 Flexi® Vectors (Cat.# C8441, C8451) are designed for untagged protein expression.

pFN18A/K HaloTag® T7 Flexi® Vectors (Cat.# G2751, G2681) are designed for protein expression with an N-terminal HaloTag® in *E. coli* and T7 cell-free expression systems.

pFN19A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1891, G1841) are designed for protein expression with an N-terminal HaloTag® in T7 and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFC20A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1681, G1691) are designed for protein expression with a C-terminal HaloTag® in *E. coli* and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFN29A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8261, G8331) are designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

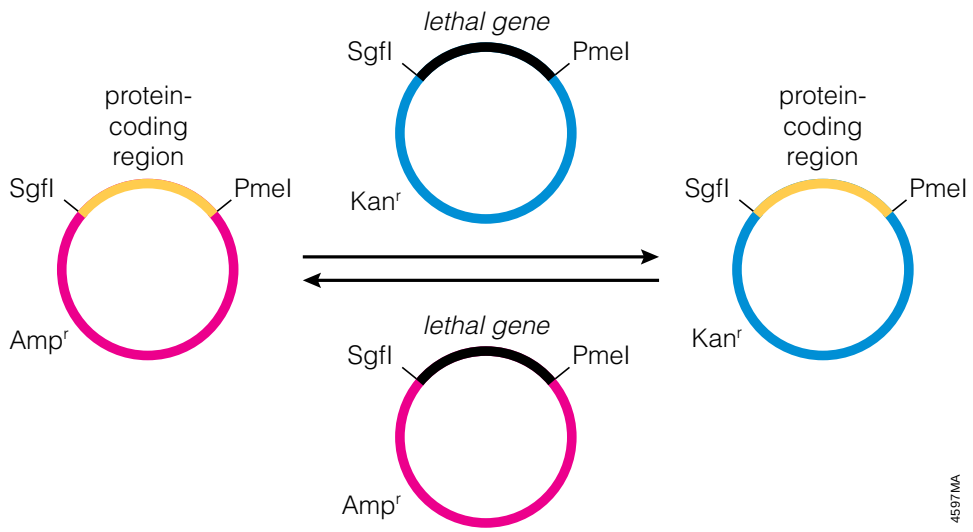
pFC30A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8321, G8381) are designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Choice of Systems:** Choose between traditional (MCS) and Flexi® cloning to get the benefits of HaloTag® technology.
- **Dual Tag:** Couple the protein solubility and labeling benefits of HaloTag® technology with the reusability and the throughput of Ni-affinity technology.
- **Versatile Cloning:** Choose from a variety of expression systems and fusion tag orientations and then transfer to others as required (for Flexi® system).
- **Time Savings:** Barnase insert (Flexi® system) decreases the number of background colonies, allowing efficient transfer of genetic constructs.

Storage Conditions: Store vectors at –20°C.



Transferring coding regions in the Flexi® Vector System.

Available in the Helix® on-site stocking system

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HQ and GST Tag Flexi® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pFN2A (GST) Flexi® Vector	20 µg	C8461
pFN2K (GST) Flexi® Vector	20 µg	C8471
pFN6A (HQ) Flexi® Vector	20 µg	C8511
pFN6K (HQ) Flexi® Vector	20 µg	C8521
pFC7A (HQ) Flexi® Vector	20 µg	C8531
pFC7K (HQ) Flexi® Vector	20 µg	C8541
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are used for inducible expression of HQ- and GST-tagged fusion proteins in *E. coli* and cell-free systems using the T7 RNA polymerase promoter. The HQ tag and polyhistidine tag (His) are comparable in their affinity for Ni ions and will bind to all His-binding surfaces and resins. In certain cases the HQ-tagged proteins can be eluted from the affinity columns at lower concentrations of imidazole—a property useful for some downstream applications such as enzymatic reactions. As with His tag, proteins can be expressed from bacterial, insect and mammalian systems and purified under either native or denaturing conditions. The GST tag has been successfully used to boost tagged protein solubility during *E. coli* expression.

The Flexi® Vector System is a simple, directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence. Direct transfers can only occur between two N-terminal tagged vectors or from an N-terminal to a C-terminal vector.

pFN2A/K (GST) Flexi® Vectors are designed for protein expression with an N-terminal GST tag in *E. coli* and T7 cell-free expression systems.

pFN6A/K (HQ) Flexi® Vectors are designed for protein expression with an N-terminal HQ tag in *E. coli* and T7 cell-free expression systems.

pFC7A/K (HQ) Flexi® Vectors are designed for protein expression with an C-terminal HQ in *E. coli* and T7 cell-free expression systems.

pF1A/K T7 Flexi® Vectors (Cat.# C8441, C8451) are designed for inducible expression of native untagged protein.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Easy to Implement and Reliable:** Choose between traditional His-affinity and GST-affinity resins for standard protein purification and prokaryotic expression applications.
- **Cost-Effective:** Technology for reusable and cost-efficient Ni (His-affinity) and gluthathione (GST-affinity) resins.
- **Versatile Cloning:** Choose from a variety of expression systems and fusion tag orientations and then transfer to others as required (for Flexi® system).
- **Time Savings:** Barnase insert (Flexi® system) decreases the number of background colonies, allowing efficient transfer of genetic constructs.

Storage Conditions: Store vectors at –20°C.

pALTER®-MAX Vector

Product	Size	Cat.#
pALTER®-MAX Vector	20 µg	Q5761
Available Separately	**Size**	**Cat.#**
Ampicillin Repair Oligonucleotide	30 µl	Q6311

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pALTER®-MAX Vector is a 5,534bp plasmid. It contains the human cytomegalovirus (CMV) immediate-early enhancer/promoter region for strong, constitutive expression of cloned DNA inserts in a variety of mammalian cell types. The pALTER®-MAX Vector as supplied is chloramphenicol-resistant and ampicillin-sensitive.

Storage Conditions: Store vector DNA at –20°C.

pGEM®-3Z Vector

Product	Size	Cat.#
pGEM®-3Z Vector	20 µg	P2151

For Research Use Only. Not for Use in Diagnostic Procedures.

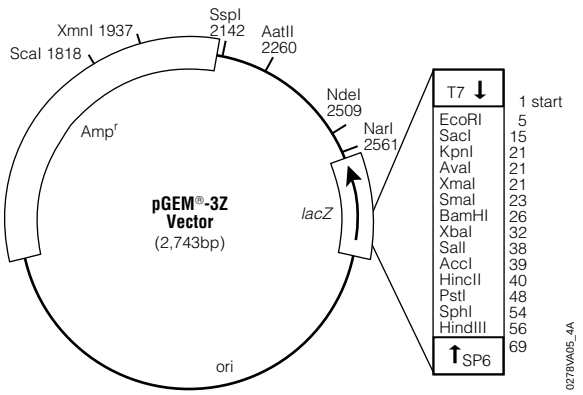
Description: The pGEM®-3Z Vector is intended for use as a standard cloning vector, as well as for the highly efficient synthesis of RNA in vitro. The vector carries the *lacZ* α-peptide and the multiple cloning region arrangement from pUC18 allowing selection of recombinants by blue/white screening. In addition, the vector contains both the SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.

The pGEM®-3Z and pGEM®-4Z Vectors are essentially identical except for the orientation of the SP6 and T7 promoters.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



pGEM®-3Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-3Zf(+) Vector	20 µg	P2271
pGEM®-3Zf(–) Vector	20 µg	P2261

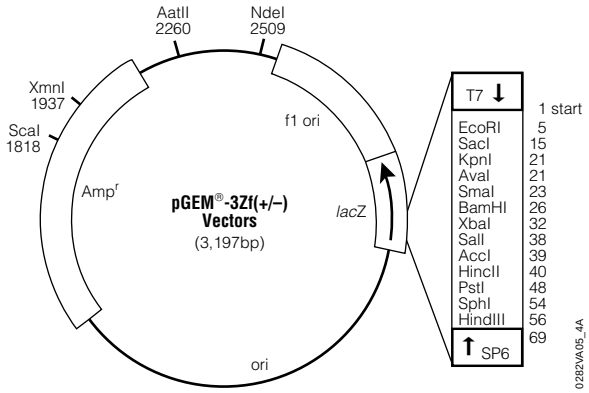
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-3Zf(+) and pGEM®-3Zf(–) Vectors are derived from the pGEM®-3Z Vector and contain the origin of replication of the filamentous phage f1. These plasmids contain T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region contains unique restriction sites for EcoRI, SacI, KpnI, AvaI, SmaI, BamHI, XbaI, SalI, AccI, HincII, PstI, SphI and HindIII. The pGEM®-3Zf(+) and -3Zf(–) Vectors are identical except for the orientation of the f1 origin and can be used as standard cloning vectors, as templates for in vitro transcription and for the production of circular ssDNA.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** These vectors can be used for standard cloning, single-stranded DNA production and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pGEM®-4Z Vector

Product	Size	Cat.#
pGEM®-4Z Vector	20 µg	P2161

For Research Use Only. Not for Use in Diagnostic Procedures.

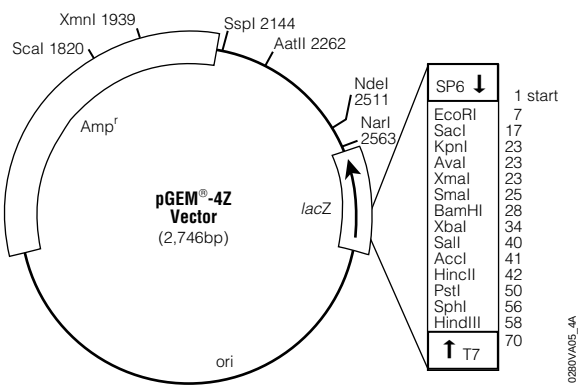
Description: The pGEM®-4Z Vector is intended for use as a standard cloning vector, as well as for the highly efficient synthesis of RNA in vitro. The vector carries the *lacZ* α-peptide and the multiple cloning region arrangement from pUC18 allowing selection of recombinants by blue/white screening. In addition, the vector contains both the SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.

The pGEM®-3Z and pGEM®-4Z Vectors are essentially identical except for the orientation of the SP6 and T7 promoters.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



Available in the Helix® on-site stocking system

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pGEM®-5Zf(+) Vector

Product	Size	Cat.#
pGEM®-5Zf(+) Vector	20 µg	P2241

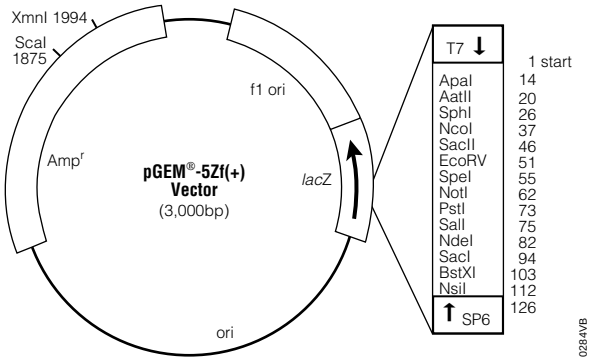
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-5Zf(+) Vector is derived from the pGEM®-3Zf(+) Vector and contains the origin of replication of the filamentous phage f1. This plasmid serves as a standard cloning vector, as a template for in vitro transcription and can be used for the production of circular ssDNA. This vector contains T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region contains unique restriction sites for ApaI, AatII, SphI, NcoI, SacII, EcoRV, SpeI, NotI, PstI, SalI, NdeI, SacI, BstXI and NsiI. This arrangement is designed specifically for generating unidirectional deletions with the Erase-a-Base™ System.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning, single-stranded DNA production and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.
- **Unidirectional Deletions:** Restriction sites are positioned conveniently for use with the Erase-a-Base™ System.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pGEM®-7Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-7Zf(+) Vector	20 µg	P2251
pGEM®-7Zf(–) Vector	20 µg	P2371

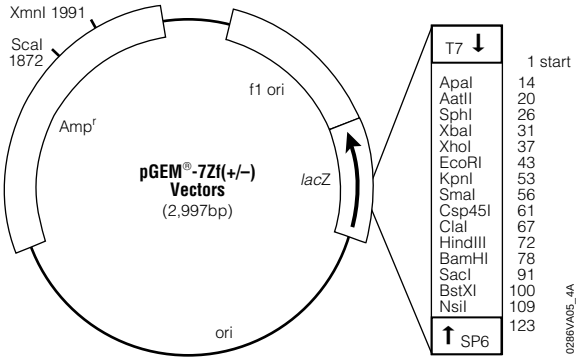
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-7Zf(+) and pGEM®-7Zf(–) Vectors are derivatives of the pGEM®-3Zf(+) Vector and contain the origin of replication of the filamentous phage f1. These plasmids serve as standard cloning vectors, as templates for in vitro transcription and can be used for the production of circular ssDNA. These plasmids contain SP6 and T7 RNA polymerase promoters flanking a region of multiple cloning sites within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region is unique and includes restriction sites for ApaI, AatII, SphI, XbaI, XhoI, EcoRI, KpnI, SmaI, ClaI, HindIII, BamHI, SacI, BstXI and NsiI. This arrangement is designed specifically for generating unidirectional deletions with the Erase-a-Base™ System. pGEM®-7Zf(+) and pGEM®-7Zf(–) Vectors are identical except for the orientation of the f1 origin.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** These standard cloning vectors are equipped for single-stranded DNA production and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.
- **Unidirectional Deletions:** Restriction sites are positioned conveniently for use with the Erase-a-Base™ System.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pGEM®-9Zf(–) Vector

Product	Size	Cat.#
pGEM®-9Zf(–) Vector	20 µg	P2391

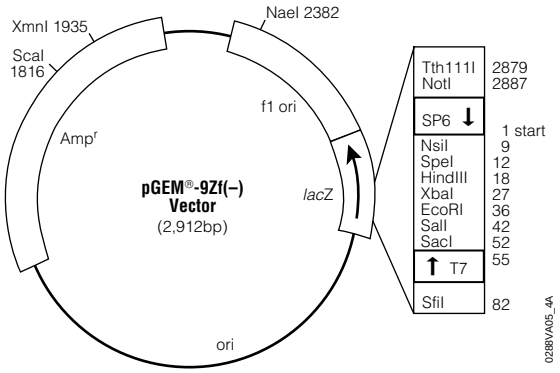
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-9Zf(–) Vector is a recombinant plasmid designed to provide a versatile range of cloning strategies, efficient synthesis of RNA in vitro and the production of single-stranded DNA. The plasmid contains T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region is unique and includes restriction sites for NsiI, SpeI, HindIII, XbaI, EcoRI, SalI and SacI.

Features:

- **Excisable SP6/T7 Insert:** This vector allows the excision of an insert containing the SP6 and T7 RNA polymerase promoters.
- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** This vector can be used for standard cloning, single-stranded DNA production and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



pGEM®-11Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-11Zf(+) Vector	20 µg	P2411
pGEM®-11Zf(–) Vector	20 µg	P2421

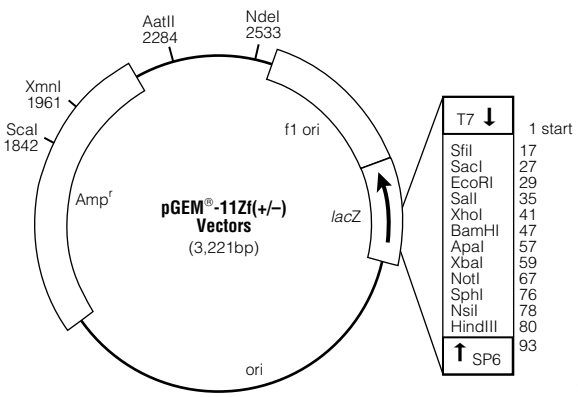
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-11Zf(+) and pGEM®-11Zf(–) Vectors can be used as standard cloning vectors, as templates for in vitro transcription and for the production of ssDNA. These plasmids contain T7 and SP6 RNA polymerase promoters flanking a multiple cloning region within the α-peptide coding region of β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be identified directly by color screening on indicator plates when using appropriate *E. coli* strains (e.g., JM109). The multiple cloning region contains unique restriction sites for SfiI, SacI, EcoRI, SalI, XhoI, BamHI, ApaI, XbaI, NotI, SphI, NsiI and HindIII. The pGEM®-11Zf(–) and pGEM®-11Zf(+) Vectors are identical except for the orientation of the f1 origin.

Features:

- **Blue/White Screening:** Allows the easy identification of recombinant clones.
- **Versatile:** These vectors can be used for standard cloning, single-stranded DNA production and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C and bacterial strain at –70°C.



Available in the Helix® on-site stocking system

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pSP64 Poly(A) Vector

Product	Size	Cat.#
pSP64 Poly(A) Vector	20 µg	P1241

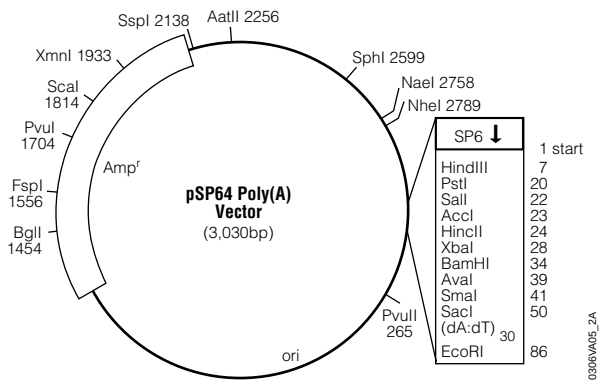
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSP64 Poly(A) Vector can be used as a standard cloning vector and for in vitro transcription from the SP6 promoter. The pSP64 Poly(A) Vector also can be used to generate poly(A)+ transcripts in vitro. The vector has a stretch of 30 dA:dT residues inserted between the SacI and EcoRI sites. Therefore, when foreign DNA is cloned into any polylinker site other than EcoRI (HindIII, PstI, SalI, AccI, HincII, XbaI, BamHI, AvaI, SmaI or SacI), linearization of the recombinant plasmid with EcoRI allows the use of SP6 RNA polymerase in vitro to prepare RNA copies of the inserted sequences that contain a synthetic 3´ "poly(A)" tail of 30 residues.

Features:

- **In Vitro Transcription:** The SP6 promoter is next to the polylinker.
- **Generates Poly(A)+ Transcripts In Vitro:** A stretch of 30 dA:dT residues are inserted between the SacI and EcoRI sites in the polylinker. Poly(A) tails can stabilize RNAs and lead to greater yields for in vitro translation reactions.
- **Convenient:** Multiple cloning region provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



pSP72 Vector

Product	Size	Cat.#
pSP72 Vector	20 µg	P2191

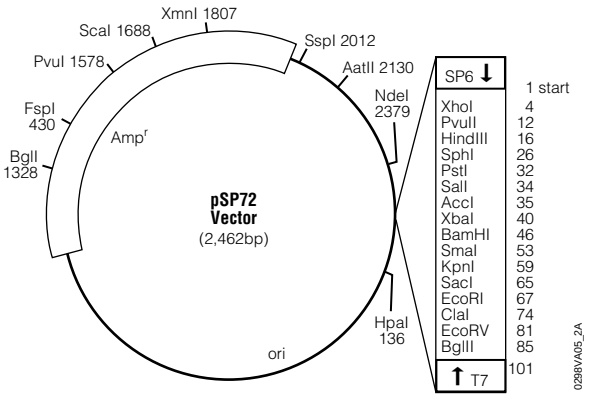
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSP72 Vector can be used as a standard cloning vector and also can be used for transcription of RNA in vitro. The pSP72 Vector contains the SP6 and T7 RNA polymerase promoters flanking a unique multiple cloning region, which includes restriction sites for XhoI, PvuII, HindIII, SphI, PstI, SalI, AccI, XbaI, BamHI, SmaI, KpnI, SacI, EcoRI, ClaI, EcoRV and BglII. The pSP72 and pSP73 Vectors are essentially identical except for the orientation of the multiple cloning site region.

Features:

- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



pSP73 Vector

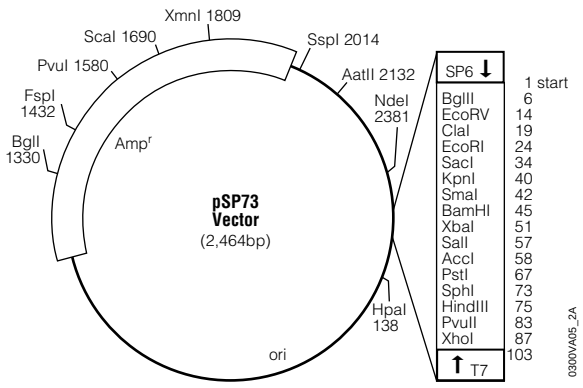
Product	Size	Cat.#
pSP73 Vector	20 µg	P2221
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pSP73 Vector offers a wide range of restriction sites, providing greater versatility in cloning and transcription of RNA in vitro. The pSP73 Vector contains the SP6 and T7 RNA polymerase promoters and a unique multiple cloning region, which includes restriction sites for BglII, EcoRV, ClaI, EcoRI, SacI, KpnI, SmaI, BamHI, XbaI, SalI, AccI, PstI, SphI, HindIII, PvuII and XhoI. The pSP72 and pSP73 Vectors are essentially identical except for the orientation of the multiple cloning region.

Features:

- **Versatile:** This vector can be used for standard cloning and in vitro transcription from SP6 and T7 RNA polymerase promoters flanking the multiple cloning region.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store vector at –20°C.



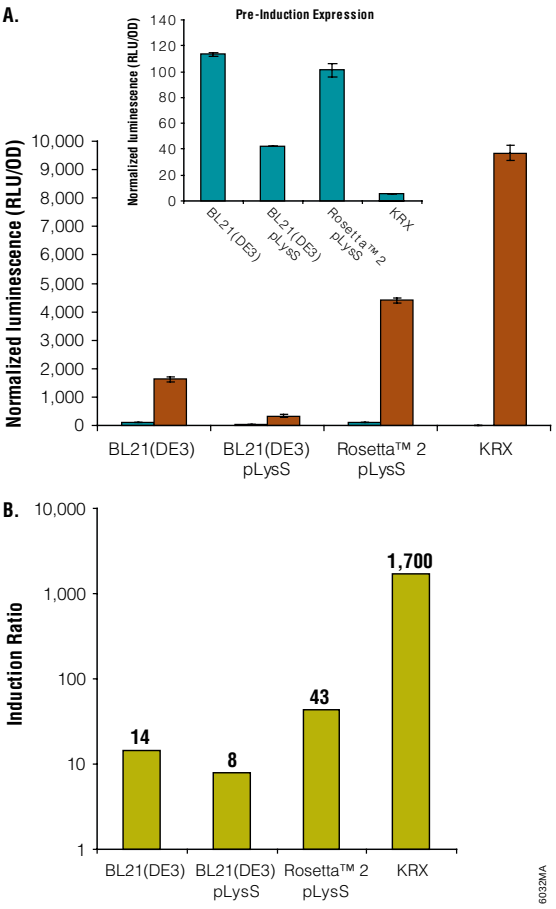
Bacterial Strains and Competent Cells

Bacterial Strains

Product	Size	Cat.#
Bacterial Strain ES1301 *mut*S, Glycerol Stock (noncompetent)	200 µl	Q6131
Bacterial Strain BMH 71-18 *mut*S, Glycerol Stock (noncompetent)	500 µl	Q6321
Bacterial Strain JM109, Glycerol Stock	500 µl	P9751
Bacterial Strain JM109(DE3), Glycerol Stock	500 µl	P9801
Bacterial Strain LE392, Glycerol Stock	500 µl	K9981
Bacterial Strain NM522, Glycerol Stock	500 µl	P2301
For Research Use Only. Not for Use in Diagnostic Procedures.		

Competent Cells

Product	Size	Cat.#
Single Step (KRX) Competent Cells	20 × 50 µl	L3002
L-Rhamnose Monohydrate	10 g	L5701
	50 g	L5702
Single-Use JM109 Competent Cells, >10^8cfu/µg	1 ml	L2005
JM109 Competent Cells, >10^7cfu/µg	1 ml	L1001
JM109 Competent Cells, >10^8cfu/µg	1 ml	L2001
Single-Use HB101 Competent Cells, >10^8cfu/µg	1 ml	L2015
HB101 Competent Cells, >10^8cfu/µg	1 ml	L2011
Single-Use Pro 5-alpha Competent Cells, >10^9cfu/µg	1 ml	L1221
Single-Use BL21(DE3)pLysS Competent Cells	1 ml	L1195
BL21(DE3)pLysS Competent Cells, >10^6cfu/µg	1 ml	L1191
For Research Use Only. Not for Use in Diagnostic Procedures.		



Pre-induction and post-induction expression levels of firefly luciferase. Cells were transformed with the pF1K T7 Flexi® Vector containing the firefly luciferase gene. Cultures were grown at 37°C to an optical density ($O.D._{600}$) of 0.8–1.0 and then moved to a 25°C incubator shaker. When cultures reached an $O.D._{600}$ of 1.0–1.5, protein expression was induced using either 0.1% rhamnose or 1mM IPTG and grown overnight at 25°C. Samples for luciferase assays were removed prior to and after induction. **Panel A.** Firefly luciferase expression level was determined using the Bright-Glo™ Luciferase Assay Reagent. Pre- and post-induction firefly luciferase expression levels were normalized to cell number (n = 3). **Panel B.** Induction ratios were calculated by dividing the post-induction luminescence values by the pre-induction values.

Available in the Helix® on-site stocking system

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7 DNA and RNA Purification

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

DNA Fragment Purification

Wizard® SV Gel and PCR Clean-Up System

Product	Size	Cat.#
Wizard® SV Gel and PCR Clean-Up System	50 preps	A9281
	250 preps	A9282
	1,000 preps	A9285
Wizard® SV Gel and PCR Clean-Up System and x-tracta™ Gel Extractor Bundle	50 preps/25 extractors	A9283
	250 preps/100 extractors	A9284
Available Separately	**Size**	**Cat.#**
Membrane Binding Solution	20 ml	A9301
Vacuum Adapters	20 each	A1331

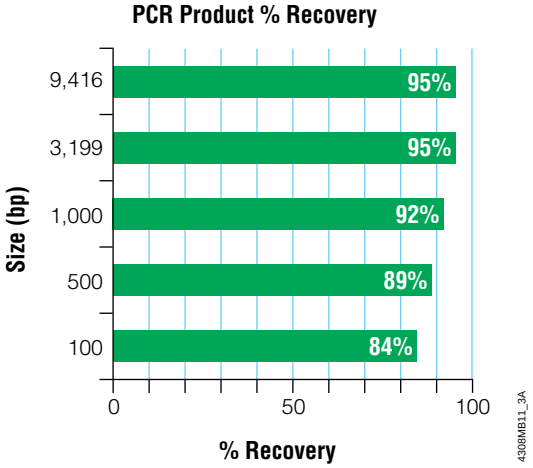
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® SV Gel and PCR Clean-Up System is designed to extract and purify DNA fragments of 100bp to 10kb from standard or low-melting agarose gels or to purify products directly from PCR and other common reactions such as restriction digests. Up to 95% recovery is achieved, depending upon the DNA fragment size. PCR products are commonly purified to remove excess nucleotides and primers. This membrane-based system, which can bind up to 40µg of DNA, allows recovery of isolated DNA fragments or PCR products in as little as 15 minutes, depending on the number of samples processed. The purified DNA can be used for automated fluorescent DNA sequencing, cloning, labeling, restriction enzyme digestion or in vitro transcription/translation without further manipulation.

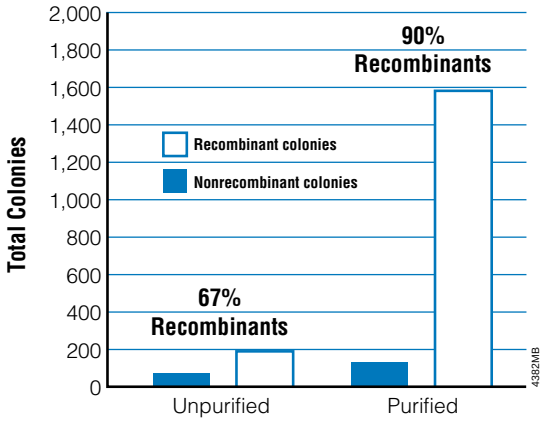
Features:

- **Improved Productivity:** Purify DNA fragments or PCR products in as little as 15 minutes.
- **Enhanced Cloning Results:** Up to 95% recovery eluted in as little as 15µl.
- **Confidence in Results:** Purified DNA routinely achieves 700 bases with >98% accuracy in automated fluorescent sequencing.
- **Applications Tested:** DNA is suitable for automated fluorescent sequencing, cloning, labeling, restriction enzyme digestion or in vitro transcription/translation without further manipulation.
- **One System to Do It All:** One system can replace up to four kits from other suppliers.

Storage Conditions: Store at 22–25°C.



Percent recovery of PCR products (100bp–9kb) from agarose gel slices using the Wizard® SV Gel and PCR Clean-Up System.



Purification of PCR products enhances cloning success. A 500bp PCR product was purified with the Wizard® SV Gel and PCR Clean-Up System and cloned into the pGEM®-T Easy Vector. Both the percent recombinants and total number of colonies increase with a pure PCR product. White bars represent recombinant colonies. Blue bars represent nonrecombinant colonies.

x-tracta™ Gel Extractor

Product	Size	Cat.#
x-tracta™ Gel Extractor	25 /pack	A2121
	100 /pack	A2122
Wizard® SV Gel and PCR Clean-Up System and x-tracta™ Gel Extractor Bundle	50 preps/25 extractors	A9283
	250 preps/100 extractors	A9284

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The x-tracta™ Gel Extractor tool provides a convenient, safe method for removal of agarose gel fragments for further processing. The device removes a 0.13 × 0.33 inch gel piece from agarose gels for easy transfer into a microcentrifuge tube for processing. The x-tracta™ tool eliminates the need for razor blades or scalpels, and its single-use design eliminates the possibility for sample-to-sample cross-contamination.

Note: The x-tracta™ Gel Extractor works best on 0.6–2% analytical grade agarose gels. Please exercise caution if using the x-tracta™ Gel Extractor on Low Melting Point (LMP) agarose gels because the extractor does not work effectively on these due to the gel consistency.

Storage Conditions: Store at 22–25°C.

Wizard® PCR Preps DNA Purification System

Product	Size	Cat.#
Wizard® PCR Preps DNA Purification System	50 preps	A7170
	250 preps	A2180
Available Separately	**Size**	**Cat.#**
Wizard® PCR Preps DNA Purification Resin	250 ml	A7181
Direct Purification Buffer	25 ml	A7241
Wizard® Minicolumns	250 each	A7211

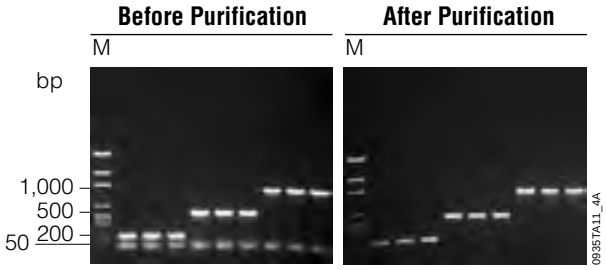
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® PCR Preps DNA Purification System provides a simple, reliable way to purify double-stranded PCR-amplified DNA. Using the 15-minute batch column purification method, PCR products are effectively separated from contaminants, including primer-dimers and amplification primers. This system also can be used to purify DNA fragments from agarose gels. The DNA can be eluted in water or TE buffer, free of salts or macromolecular contaminants. Multiple PCR Preps may be processed easily at one time with the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231).

Features:

- **Improved Productivity:** Purify PCR products directly from reactions in 15 minutes.
- **Flexibility:** Separate PCR products from other reaction components such as primers and primer-dimers or from gel slices.
- **Labor Saving Format:** Process multiple purifications simultaneously using the Vac-Man® Laboratory Vacuum Manifold.

Storage Conditions: Store at 22–25°C.



Recovery of PCR products using Wizard® PCR Preps Resin. A representative sample from the simultaneous purification of 96 PCR products was chosen to determine the effectiveness of the procedure by gel electrophoresis. Equivalent amounts from before and after purification were separated on a 1% agarose gel and stained with ethidium bromide.

Wizard® DNA Clean-Up System

Product	Size	Cat.#
Wizard® DNA Clean-Up System	100 preps	A7280

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® DNA Clean-Up System provides a simple and effective way to purify linear and circular DNA (200–50,000bp) from many molecular biology reactions. Using a quick batch-column procedure, the entire process can be completed in 15 minutes or less with no organic extractions or ethanol precipitations. DNA is eluted in water or TE buffer, ready for use.

Features:

- **Improved Productivity:** Results in 15 minutes or less.
- **Convenience:** No phenol extractions or ethanol precipitations.
- **Flexibility:** Works with a wide range of DNA sizes from 200–50,000bp in length.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Wizard® SV 96 PCR Clean-Up System

Product	Size	Cat.#
Wizard® SV 96 PCR Clean-Up System	1 × 96 preps	A9340
	100 × 96 preps	A9345
	4 × 96 preps	A9341
	8 × 96 preps	A9342
Available Separately	**Size**	**Cat.#**
Membrane Binding Solution	20 ml	A9301
Wizard® SV 96 Binding Plates	10 pack	A2271

For Research Use Only. Not for Use in Diagnostic Procedures.

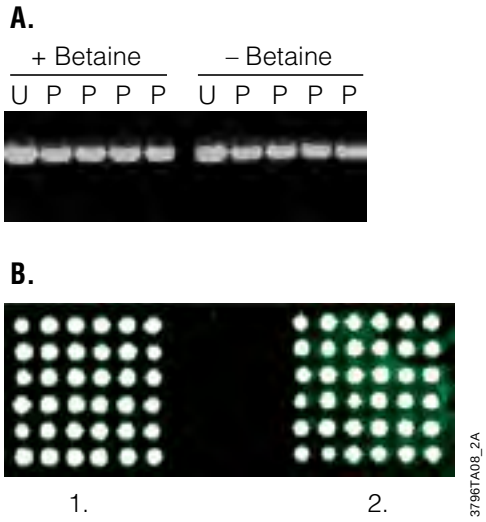
Description: The Wizard® SV 96 PCR Clean-Up System is designed for high-throughput purification of 100bp to 10kb PCR products from excess nucleotides, primers and primer dimers. This membrane-based system allows recovery of >90% in as little as 20 minutes. The purified DNA can be used for automated fluorescent sequencing, cloning, labeling, restriction digestion or microarray analysis without further manipulation. The Wizard® SV 96 PCR Clean-Up System uses 96-well filtration without the need to disassemble the manifold. Filtrate waste is delivered directly to a vacuum trap, eliminating the need to dispose of collected waste within the manifold assembly. Protocols are available for automated instruments from Beckman Coulter and PerkinElmer.

Features:

- **High Performance:** Optimized methods deliver purified PCR products suitable for demanding applications such as microarray analysis.
- **Confidence:** Average recovery for 100–500bp fragments of >90%. Automated fluorescent sequencing Phred* 20 scores >600.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

*A Phred score is a widely recognized method to measure the quality of DNA sequences. Phred is a base-calling program for DNA sequence traces available from Codoncode Corporation.

Storage Conditions: Store at 22–25°C.



Microarray of purified PCR products. PCR products (300bp) were amplified in the presence or absence of 1M betaine, then purified using the Wizard® SV 96 PCR Clean-Up System. **Panel A.** Agarose gel analysis. Purified (P) and unpurified (U) PCR products amplified with (+) or without (–) betaine were separated on an ethidium bromide-stained, 2% agarose gel. **Panel B.** Representative microarray blocks of purified PCR product hybridized to complementary Cy®-labeled cDNA. Betaine interferes with microarray analysis, so the fact that the microarray data for PCR with and without betaine are equivalent clearly demonstrates removal of betaine using the Wizard® SV 96 PCR Clean-Up System. **1.** PCR product amplified under standard amplification conditions (–betaine). **2.** 1M betaine added to the PCR mix.

Wizard® MagneSil® Sequencing Reaction Clean-Up System

Product	Size	Cat.#
Wizard® MagneSil® Sequencing Reaction Clean-Up System	4 × 96 preps	A1831
	8 × 96 preps	A1832
Wizard® MagneSil® Sequencing Reaction Clean-Up System, HTP1	100 × 96 preps	A1835
Available Separately	**Size**	**Cat.#**
MagneSil® GREEN	100 ml	A8231

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® MagneSil® Sequencing Reaction Clean-Up System was developed for high-throughput purification of sequencing reactions, including BigDye® Terminator reactions. Cleanup is performed using the proprietary MagneSil® GREEN Paramagnetic Particles with standard, nonskirted 96-well amplification plates. No user intervention is required from the time the plates are placed on the instrument until the samples are ready for loading onto the fluorescent DNA sequencer. Protocols are available for automated instruments from Beckman Coulter and Tecan.

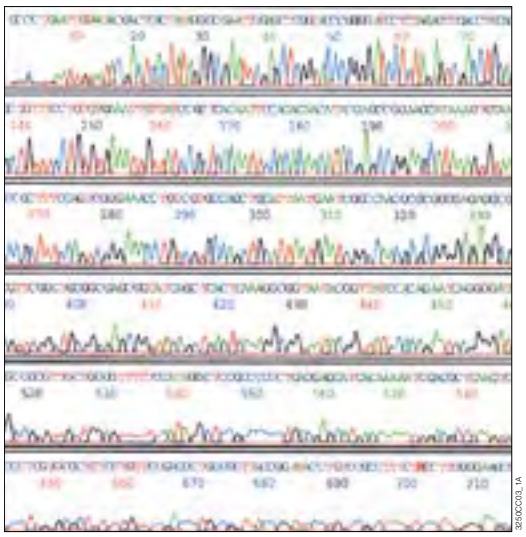
The system relies upon the MagnaBot® II for magnetic separation. The Plate Clamp 96 and Plate Stand are recommended for automated use because they ensure PCR plates are uniformly flat for liquid transfer on a robotic instrument.

Features:

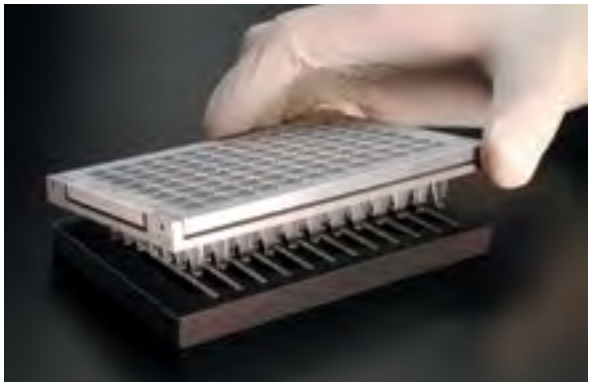
- **Get Immediate Results:** Validated, walkaway method.
- **Gain Confidence in Results:** Purified products are approved for fluorescent sequencing reactions. Phred* 20 quality scores ≥650 bases.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**

*A Phred score is a widely recognized method to measure the quality of DNA sequences. Phred is a base-calling program for DNA sequence traces available from Codoncode Corporation.

Storage Conditions: Store at 22–25°C.



Electropherogram of purified sequencing reactions analyzed on an ABI PRISM® 3700 DNA Sequencer. BigDye® terminator reactions purified with the Wizard® MagneSil® Sequencing Reaction Clean-Up System.



Cleanup is performed using the MagnaBot® II Magnetic Separation Device (Cat.# V8351) accompanied by the Plate Clamp 96 (Cat.# V8251). These devices are designed to work with most robotic platforms.

Available in the Helix® on-site stocking system

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Genomic DNA Purification Kits

ReliaPrep™ Large Volume HT gDNA Isolation System

Product	Size	Cat.#
ReliaPrep™ Large Volume HT gDNA Isolation System	96 × 10ml to 960 × 1ml preps	A1751
		A2751
HSM 2.0 Instrument	1 each	A2715
Alkaline Protease (APA)	130 ml	A1721
Cell Lysis Buffer (CLD)	1,400 ml	A1731
Binding Buffer (BBA)	1,600 ml	A1741
ReliaPrep™ Resin	115 ml	A1752
Prepared Wash Buffer (WBC)	3,500 ml	A2681
Proteinase K (PK) Solution	23 ml	A5051
Nuclease-Free Water	500 ml	P1197
Available Separately	**Size Conc.**	**Cat.#**
RNase A Solution	5 ml 4 mg/ml	A7974
20X TE Buffer (pH 7.5)	25 ml	A2651
Tissue Lysis Buffer (TLA)	500 ml	A5091
Nuclease-Free Water	1,000 ml	P1199
HSM 2.0 Instrument Cover	1 each	A2712
HSM 2.0 Tube Rack	1 each	A2713
HSM 2.0 Tube Rack Stand	1 each	A2714
HSM 2.0 Instrument 1-Year Service Agreement	1 each	SA1330
ReliaPrep™ LV 32 HSM Standard Service Agreement	1 each	SA3070
Bottle for 50% Ethanol	1 each	A2691

A1751, A7974, A2651, A2751, A2715, A5091, A1721, P1199, A1731, A2712, A1741, A2713, A1752, A2714, A2681, A5051, SA3070, A2691, P1197 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ Large Volume HT gDNA Isolation System isolates genomic DNA (gDNA) from 1–10ml of blood in a scalable format. The chemistry eliminates tedious centrifugation steps as well as the use of hazardous chemicals, which are inherent in precipitation-based chemistries. Each reagent kit provides enough reagents to process up to 96 × 10ml whole blood samples. The system has been automated on robotic liquid-handling workstations, allowing walkaway purification of genomic DNA from 1–10ml of whole blood, regardless of sample storage or shipping conditions. For low-throughput isolation of gDNA from up to 32 samples at one time, the HSM 2.0 can be used in a manual mode, where the user performs the pipetting functions. The HSM has software that controls the instrument and directs the user through the purification protocol.

Features:

- **Decrease Hands-On Time:** Automation reduces operator time spent on instrument setup and takedown by allowing walkaway operation for large numbers of samples at a time.
- **Remove Protocol Bottlenecks:** Heater Shaker Magnet eliminates the need to move samples on the robot deck, reducing instrument failures; precipitation-free chemistry dramatically reduces purification failures.
- **Achieve Peace of Mind:** Automated liquid level sensing for all samples and solutions with operator notification allows recovery of samples in case of error.
- **Isolate Pure DNA from All Samples:** Purification chemistry is equally effective at recovering DNA from pristine as well as challenged (hemolysed or frozen) samples.
- **Save a Day or Two of Processing:** Samples are eluted in buffer, ready for use in downstream assays or archiving, eliminating resuspension of pelleted DNA, which can take 24–48 hours.
- **Reduce Waste:** Chemistry is automatically scaled for each sample, using only the reagent required for optimal purification. Plastic use is also conserved, reducing liquid and solid waste during sample runs.

Storage Conditions: Store at 15–30°C.

11277TA

HSM 2.0 Instrument, Cat.# A2715

ReliaPrep™ Blood gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ Blood gDNA Miniprep System	100 preps	A5081
	250 preps	A5082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ Blood gDNA Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 200µl of blood or body fluid, consistently isolating pure, intact gDNA without the use of alcohol washes or precipitations. Genomic DNA can be prepared from fresh or frozen blood in less than 40 minutes with expected DNA yields of 4–10µg, depending on the white blood cell count of the blood sample.

Features:

- **Easy to Use:** Reagents are supplied "ready-to-go"; no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less.
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users even with hemolyzed samples.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ gDNA Tissue Miniprep System

Product	Size	Cat.#
ReliaPrep™ gDNA Tissue Miniprep System	100 preps	A2051
	250 preps	A2052

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ gDNA Tissue Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 25mg of tissue, a buccal (cheek) swab, or a 1cm mouse tail snip, obtaining intact gDNA without the use of ethanol washes or precipitations.

Features:

- **Easy to Use:** Reagents are supplied ready to use—no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less (hands-on time).
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ 96 gDNA Miniprep HT System

Product	Size	Cat.#
ReliaPrep™ 96 gDNA Miniprep HT System	1 × 96 preps	A2670
	4 × 96 preps	A2671
Available Separately	**Size Conc.**	**Cat.#**
20X TE Buffer (pH 7.5)	25 ml	A2651
Heat Block Adapter	1 each	A2661
RNase A Solution	5 ml 4 mg/ml	A7974
25mM Tris-HCl (pH 8.0)	60 ml	A2641
10mM EDTA (pH 8.0)	10 ml	A2631

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ 96 gDNA Miniprep HT System provides a simple and reliable method for the rapid isolation of gDNA in a multiwell format. gDNA may be purified from blood and Oragene®•Discover sample collection devices. The purified gDNA can be used directly in PCR assays, microarrays and next-generation sequencing applications. The use of paramagnetic particles for DNA capture eliminates the need for centrifugation or vacuum manifolds, making the system suitable for full automation. In addition, the system does not require an organic solvent, making it safe and convenient. DNA yields of up to 12µg are expected from input blood volumes of 350µl, depending on the WBC count of the sample. Saliva samples can have variable amounts of gDNA, and up to 18µg or more of DNA may be recovered from a 700µl Oragene® collection device sample.

Features:

- **Improve Productivity:** Walkaway automation of genomic DNA extraction.
- **Eliminate Sample Rework:** Robust, precipitation-free protocol, no chance of lost pellets.
- **Simplify Workflow:** High yields of pure DNA from pristine and challenged or hemolysed samples.
- **Reduce Time to Results:** Pure gDNA ready for demanding applications—samples in solution—no resuspension required.

ReliaPrep™ FFPE gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE gDNA Miniprep System	10 reactions	A2351
	100 reactions	A2352
Available Separately	**Size**	**Cat.#**
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE gDNA Miniprep System provides a complete, all-inclusive method for purifying quality genomic DNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Genomic DNA can be isolated from FFPE tissue in approximately two and one-half hours with minimal hands-on time.

Features:

- **Isolate Quality, Intact gDNA:** Optimized lysis and binding conditions reverse modifications introduced by the fixation process, resulting in intact, amplifiable gDNA.
- **Safely Deparaffinize Your Sample:** Deparaffinization step occurs without harsh organic solvents.
- **Save Time:** Purify gDNA from FFPE tissue in less than two and one-half hours with minimal hands-on time. No overnight digestion required.
- **Easy to Use:** Minimal preparation time; simply add ethanol and go!

Storage Conditions: Store at room temperature.

Available in the Helix® on-site stocking system

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Wizard® Genomic DNA Purification Kit

Product	Size	Cat.#
Wizard® Genomic DNA Purification Kit	100 isolations × 300 µl	A1120
	500 isolations × 300 µl	A1125
	100 isolations × 10 ml	A1620
Available Separately	**Size Conc.**	**Cat.#**
Cell Lysis Solution (Genomic Purification)	1 liter	A7933
Nuclei Lysis Solution	50 ml	A7941
	1 liter	A7943
Protein Precipitation Solution	25 ml	A7951
	350 ml	A7953
DNA Rehydration Solution	50 ml	A7963
RNase A Solution	1 ml 4 mg/ml	A7973
Proteinase K	100 mg	V3021

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® Genomic DNA Purification Kit provides a simple, solution-based method for isolation of DNA from white blood cells, tissue culture cells, animal tissue, plant tissue, yeast and Gram-positive and Gram-negative bacteria. DNA purified with this system is suitable for a variety of applications, including amplification, digestion with restriction endonucleases and membrane hybridizations (e.g., Southern and dot/slot blots).

Features:

- **Improved Productivity:** Rapidly isolate genomic DNA from blood, tissue culture, animal and plant cells, bacteria and yeast in approximately 60 minutes.
- **Scalability:** Reagent volumes can be adjusted to correspond to the amount of material to be processed.
- **Flexibility:** Genomic DNA purified from a variety of sample types is suitable for a variety of applications.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

DNA Yields from Various Starting Materials Using the Wizard® Genomic DNA Purification Kit.

Source	Amount of Starting Material	Typical DNA Yield
Whole Blood	300µl	5–15µg
	1ml	25–50µg
	10ml	250–500µg
	96-well plate, 50µl/well	0.2–0.7µg
Tissue Culture Cells	10^6–10^7 cells	5–30µg
Animal Tissue		
Mouse Liver	11mg	15–20µg
Mouse Tail	0.5–1cm of tail	10–30µg
Insect Cells	5×10^6 cells	16µg
Plant Leaf Tissue	40mg	7–12µg
Bacterial Culture*	10^8–10^{10} cells	5–20µg
Yeast*	1.9×10^8 cells	4.5–6.5µg

*Overnight culture.

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Wizard® SV Genomic DNA Purification System

Product	Size	Cat.#
Wizard® SV Genomic DNA Purification System	50 preps	A2360
Wizard® SV Genomic DNA Purification System	250 preps	A2361
Available Separately	**Size Conc.**	**Cat.#**
Wizard® SV Lysis Buffer	50 ml	Z3052
Column Wash Solution (CWA)	185 ml	A1311
Nuclei Lysis Solution	50 ml	A7941
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml	V4231
RNase A Solution	1 ml 4 mg/ml	A7973
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

A2360, A6772, Z3052, A2361, A6770, A7941, V4231, A6774, A7973, V1231, V4741 For Research Use Only. Not for Use in Diagnostic Procedures. A1311 For Laboratory Use.

Description: The Wizard® SV Genomic DNA Purification System provides a fast, simple, membrane-based technique for preparing genomic DNA from cultured cells and tissue, including mouse tails. Genomic DNA can be purified from cultured cells in about 20 minutes. Isolation from tissue or mouse tails requires an overnight digestion with Proteinase K (Cat.# V3021). Amplifiable genomic DNA can be isolated from up to 5×10^6 cells, 20mg of tissue or up to 1.2cm of a mouse tail tip without a centrifugation clearing step.

The Wizard® SV Genomic DNA Purification System can be used in either a microcentrifuge (spin) or vacuum protocol. Up to 20 samples can be processed at once in the vacuum format with the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231) and the Vacuum Adapters (Cat.# A1331).

Features:

- **Improved Productivity:** Obtain genomic DNA approximately 20 minutes after lysis.
- **High Yield:** Purify 20–30µg of DNA per prep from 1.2cm mouse tail.
- **Format Choice:** Perform purification by either spin or vacuum formats.

Storage Conditions: Store at 22–25°C.

Average Yield of Genomic DNA Purified From Various Tissues Using the Wizard® SV and SV 96 Genomic DNA Purification Systems.

Sample Type	Starting Amount	Average Yield
Mouse Tail Clipping	20mg	20µg
Mouse Liver	20mg	15µg
Mouse Heart	20mg	10µg
Mouse Brain	20mg	6µg
CHO Cells	1×10^6 cells	5µg
NIH/3T3 Cells	1×10^6 cells	9µg
293 Cells	1×10^6 cells	8µg

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Wizard® SV 96 Genomic DNA Purification System

Product	Size	Cat.#
Wizard® SV 96 Genomic DNA Purification System	1 × 96 preps	A2370
Wizard® SV 96 Genomic DNA Purification System	4 × 96 preps	A2371
Available Separately	**Size Conc.**	**Cat.#**
Wizard® SV Lysis Buffer	50 ml	Z3052
Column Wash Solution (CWA)	185 ml	A1311
Nuclei Lysis Solution	50 ml	A7941
EDTA, 0.5M (pH 8.0), Molecular Biology Grade	100 ml	V4231
RNase A Solution	1 ml 4 mg/ml	A7973
Wizard® SV 96 Binding Plates	10 pack	A2271

A2370, A6782, Z3052, A2371, A6780, A7941, V4231, A6784, A7973, A2271 For Research Use Only. Not for Use in Diagnostic Procedures. A1311 For Laboratory Use.

Description: The Wizard® SV 96 Genomic DNA Purification System provides a high-throughput, membrane-based technique for consistent preparation of genomic DNA from cultured cells and tissue, including mouse tails. Amplifiable genomic DNA can be isolated from up to 5×10^6 cells, 20mg of tissue or up to 1.2cm of a mouse tail tip without a centrifugation clearing step.

With the Wizard® SV Genomic DNA purification system, genomic DNA is purified from cell lysates using 96-well vacuum filtration. Washing the bound DNA requires no disassembly of the manifold, and filtrate waste products are delivered directly to a vacuum trap, eliminating the need to empty waste collection trays.

The Wizard® SV Genomic DNA Purification System is designed for use either in a manual format or with Beckman Coulter or PerkinElmer automated instruments.

Features:

- **Improve Productivity:** Obtain genomic DNA from mouse tails in 45–60 minutes, genomic DNA from cultured cells in 30 minutes. No spins required.
- **Achieve High Yield:** Purify 20–30µg of DNA per prep from 1.2cm of mouse tail.
- **Gain Confidence in Applications:** Purified DNA ready for amplification.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

MagneSil® ONE, Fixed Yield Blood Genomic System

Product	Size	Cat.#
MagneSil® ONE, Fixed Yield Blood Genomic System	1 × 96 preps	MD1370
Collection Plates (4-pack)	1 each	A9161
Available Separately	**Size**	**Cat.#**
Lysis Buffer, Blood	160 ml	MD1392
MagneSil® PMPs-Fixed Yield	25 ml	MD1451
Anti-Foam Reagent	300 µl	MD1431
Alcohol Wash, Blood	120 ml	MD1412
Elution Buffer, Blood	45 ml	MD1421

MD1370, MD1392, MD1451, A9161, MD1421 For Research Use Only. Not for Use in Diagnostic Procedures. MD1431, MD1412 For Laboratory Use.

Description: The MagneSil® ONE, Fixed Yield Blood Genomic System purifies 1µg of DNA (+/– 50%) from 60µl of anti-coagulated whole blood. Purification of a fixed yield of DNA eliminates the need to quantitate and normalize concentrations postpurification. The highly pure DNA isolated is suitable for use in PCR, multiplex PCR and SNP genotyping applications.

Walkaway automation is available on the Beckman Coulter Biomek® FX in a 96-well format. Process 96 samples in about 1 hour with no hands-on time following robot setup.

Features:

- **Improve Productivity:** Use walkaway automation to extract genomic DNA and eliminate DNA quantitation prior to PCR.
- **Achieve Consistent Results:** Obtain 1µg (fixed yield) of highly pure DNA from 60µl of blood.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 20–25°C.

Available in the Helix® on-site stocking system
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MagneSil® Blood Genomic, Max Yield System

Product	Size	Cat.#
MagneSil® Blood Genomic, Max Yield System	1 × 96 preps	MD1360
Available Separately	**Size**	**Cat.#**
Anti-Foam Reagent	300 µl	MD1431
MagneSil® Paramagnetic Particles	25 ml	MD1441
Salt Wash, Blood	90 ml	MD1401
Alcohol Wash, Blood	70 ml	MD1411
Elution Buffer, Blood	45 ml	MD1421

MD1360, MD1401, MD1411, MD1421 For Research Use Only. Not for Use in Diagnostic Procedures. MD1431, MD1441 For Laboratory Use.

Description: The MagneSil® Blood Genomic, Max Yield System provides automated high-throughput DNA purification on the Beckman Coulter Biomek® FX using MagneSil® Paramagnetic Particle technology. DNA from 96 samples of anti-coagulated human whole blood is purified in about 1 1/2 hours with no hands-on time once the robot protocol is initiated. Studies on DNA recovery and purity and PCR results show no cross-contamination between samples in adjacent wells. Purified DNA is qualified for single-locus simple PCR as well as more demanding applications such as multiplex PCR (e.g., PowerPlex® 16 System [Cat.# DC6531], Y Chromosome Deletion Detection System [Cat.# MD1531]) and SNP genotyping.

Features:

- **Improve Productivity:** Walkaway automation of genomic DNA extraction.
- **Achieve Maximum Yield:** The average yield of 96 purified samples from normal healthy adults is ≥4µg.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

MagneSil® Genomic, Large Volume System

Product	Size	Cat.#
MagneSil® Genomic, Large Volume System	48 preps	A4082
Available Separately	**Size**	**Cat.#**
eLysis Buffer, Large Volume System	1 L	A4091

A4082 For Research Use Only. Not for Use in Diagnostic Procedures. A4091 For Laboratory Use.

Description: The MagneSil® Genomic, Large Volume System, is designed for scalable, automated genomic DNA isolation from large-volume samples, eliminating laborious centrifugation steps and the use of hazardous organic solvents. The system has been automated on the Tecan Freedom EVO® liquid handler, providing walkaway purification of genomic DNA from a variety of starting materials, including 1–10ml whole blood samples, regardless of sample storage or shipping conditions. The instrument uses only the amount of reagents required to process each sample, maximizing efficiency and value per prep.

The MagneSil® Genomic, Large Volume System, uses a robust noncentrifugation-based automated method to purify genomic DNA from fresh, frozen or mishandled blood and other samples with similar yields and quality. The system bypasses many of the challenges of traditional centrifugation-based methods by lysing the entire whole blood sample and then directly capturing total genomic DNA from the lysed sample using MagneSil® Paramagnetic Particles (PMPs). The genomic DNA bound to the MagneSil® PMPs is washed to remove contaminants such as heme and cellular proteins, then eluted into an aqueous solution ready for use in downstream applications. There is no need for tedious and lengthy DNA rehydration. The purified genomic DNA is suitable for a variety of downstream applications such as single and multiplex PCR, restriction digestion and real-time PCR.

Features:

- **Improve Productivity:** Walkaway automation from blood-collection tube to application-ready DNA.
- **Rely on an Integrated Solution:** One reagent system and automated method provide yield and purity from any sample type (fresh or frozen blood, samples of unknown quality and mixed sample populations).
- **Enjoy Smart Scalability:** Scale sample size from 1–10ml of blood, batch size from 1–96 samples and reagent usage from input sample volume.
- **Achieve Turnkey Automation:** Optimized protocol available for the Tecan Freedom EVO® instrument. This and other validated automated methods are available at: **www.promega.com/automethods/**

Storage Conditions: Store at 22–25°C.

Fixed-Tissue Genomic DNA Purification

Product	Size	Cat.#
MagneSil® Genomic, Fixed Tissue System	100 samples	MD1490

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneSil® Genomic, Fixed Tissue System provides a fast, simple technique to prepare genomic DNA from formalin-fixed, paraffin-embedded tissue. After an overnight Proteinase K digestion, genomic DNA can be manually purified from formalin-fixed, paraffin-embedded thin tissue sections in less than an hour. Amplifiable genomic DNA can be isolated from 10µm thin sections without centrifugation of the lysate prior to purification. Up to 12 samples can be processed in the manual format using the MagneSphere® Technology Magnetic Separation Stand (twelve-position) (Cat.# Z5342).

Features:

- **Purify High-Quality DNA:** The composition of the wash buffers and protocol have been optimized to yield genomic DNA that is largely free of small DNAs, a potent inhibitor of PCR amplification.
- **Rely on Performance-Tested Amplification Results:** Amplify targets in multiplex PCR and targets as large as 450–1,800bp.

Storage Conditions: MD1490 consists of two separate items shipped at different temperatures. MD1170 (part 1 of 2 for MD1490—Processing Module) contains Proteinase K, DTT and Incubation Buffer, which are shipped on dry ice. Store MD1170 at –20°C. MD1180 (part 2 of 2 for MD1490—Purification Module) contains Lysis Buffer, 2X Wash Buffer, Resin and Elution Buffer, which are shipped at room temperature, 22–25°C. Store MD1180 at room temperature, 22–25°C.

ReadyAmp™ Genomic DNA Purification System

Product	Size	Cat.#
ReadyAmp™ Genomic DNA Purification System	100 reactions	A7710

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReadyAmp™ Genomic DNA Purification System yields single-stranded DNA (ssDNA) from whole blood or blood stains that may be used directly in amplification reactions without further manipulation. The process takes less than one hour and requires no organic extractions or ethanol precipitations.

Features:

- **Simple and Effective:** ReadyAmp™ resin removes PCR inhibitors.
- **Convenient:** Isolated DNA can be used directly in PCR amplifications.

Storage Conditions: Store at 22–25°C.

MagneSil® KF, Genomic System

Product	Size	Cat.#
MagneSil® KF, Genomic System	200 preps	MD1460
Available Separately	**Size**	**Cat.#**
MagneSil® KF, Paramagnetic Particles	40 ml	MD1471
Lysis Buffer, KF	160 ml	MD1521

MD1460 For Research Use Only. Not for Use in Diagnostic Procedures. MD1471, MD1521 For Laboratory Use.

Description: The MagneSil® KF, Genomic System is designed for easy, walkaway, low- to moderate-throughput automated genomic DNA purification from blood and other samples. For blood samples, lysis occurs concurrently with DNA binding to MagneSil® Paramagnetic Particles. After washes to remove heme and proteins, purified genomic DNA is ready for PCR and other downstream applications. The system is designed to purify 2–6µg of genomic DNA from 200µl of anticoagulated liquid blood.

The MagneSil® KF, Genomic System is designed to run on the Thermo Electron KingFisher® mL instrument, which automates DNA purification in a flexible 1- to 15-sample batch, 25-minute walkaway format. The compact size of the KingFisher® mL allows it to be used on the benchtop or in a laminar flow hood. Please contact Thermo Electron for more information on the KingFisher® mL instrument.

Features:

- **Improve Productivity:** Use automated 25-minute optimized, walkaway protocol with no training. Eliminate laborious manual methods.
- **Rely On a Performance-Tested System:** Purified DNA is tested in PCR, multiplex PCR, fluorescent STR analysis and SNP genotyping applications.
- **Conserve Valuable Lab Space:** The small footprint (30 × 30 × 30cm) of the Thermo Electron KingFisher® mL instrument delivers automated throughput that makes sense for smaller labs. No external PC required.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**

Storage Conditions: Store at 22–25°C. Do not freeze the MagneSil® KF Paramagnetic Particles.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

MagaZorb® DNA Mini-Prep Kit

Product	Size	Cat.#
MagaZorb® DNA Mini-Prep Kit	200 preps	MB1004
	800 preps	MB1008
Available Separately	**Size Conc.**	**Cat.#**
Proteinase K (PK) Solution	16 ml 20 mg/ml	MC5008
20-Position Microcentrifuge Tube Magnetic Separator	1.5 ml	CD4002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagaZorb® DNA Kit provides an easy, fast and cost-effective technique for isolating PCR-quality DNA. Using one simple protocol, a high yield of purified DNA can be isolated from a wide variety of sources including whole blood (fresh or frozen, citrate-, heparin- or EDTA-treated), buffy coat, leukocytes, milk, seminal fluid, dried blood spots, cultured cells, tissue (fresh, frozen or formalin-fixed paraffin-embedded), saliva, urine, stool, hair, buccal swabs and vaginal swabs.

The 20-Position Microcentrifuge Tube Magnetic Separator (Cat.# CD4002) utilizes a microcentrifuge tube rack that can be removed from the high-strength magnets for wash steps or incubation in a water bath. The rack is designed to hold the microcentrifuge tubes so that they will not fall out even when turned upside down, and it can withstand temperatures of up to 80°C for convenient manipulation of sample tubes. Please note that the magnets in the 20-Position Microcentrifuge Tube Magnetic Separator are designed specifically for use with the MagaZorb® DNA Kit; separation may not work with other particles.

Features:

- **Convenient:** Contains all needed reagents so that no reagent preparation is required.
- **Efficient:** Eliminates centrifugation, vacuum filtration or column separation, increasing sample throughput and improving reproducibility.
- **Safe:** Does not require organic solvents, eliminating the need for special storage or waste disposal.

Storage Conditions: Store at 22–25°C.

Proteinase K (PK) Solution

Product	Size Conc.	Cat.#
Proteinase K (PK) Solution	4 ml 20 mg/ml	MC5005
	16 ml 20 mg/ml	MC5008

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Proteinase K, produced by the fungus *Tritirachium album* Limber, is a serine protease that exhibits broad cleavage activity. It cleaves peptide bonds adjacent to the carboxylic group of aliphatic and aromatic amino acids and is useful for general digestion of protein in biological samples. It has been purified to remove RNase and DNase activities. The stability of Proteinase K in urea and SDS and its ability to digest native proteins make it useful for a variety of applications including preparation of chromosomal DNA for pulsed-field gel electrophoresis, protein fingerprinting and removal of nucleases from preparations of DNA and RNA. A typical working concentration for Proteinase K is 50–100µg/ml.

Formulation: Proteinase K (PK) Solution is supplied at a concentration of 20mg/ml in 10mM Tris-HCl (pH 7.5), 1mM calcium chloride and 50% glycerol.

Features:

- **Stable:** Active over a pH range of 4.3–12.0 in 0.5% SDS or 1% Triton® X-100 and retains >80% of its activity at temperatures up to 60°C.
- **Easy to Use:** Provided in solution stable at room temperature and does not require resuspension or thawing prior to use.

Storage Conditions: Store at 22–25°C.

Wizard® Magnetic 96 DNA Plant System

Product	Size	Cat.#
Wizard® Magnetic 96 DNA Plant System	2 × 96 preps	FF3760
	4 × 96 preps	FF3761
Available Separately	**Size**	**Cat.#**
Wash Buffer, Plant	40 ml	A3811

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® Magnetic 96 DNA Plant System is designed for manual or automated 96-well, high-throughput purification of DNA from plant leaf and seed tissue. The system has been validated with corn and tomato leaf, as well as with canola and sunflower seeds. The DNA purified from these samples can be used in PCR as well as more demanding applications such as RAPD analysis. Unlike column-based systems, the binding of nucleic acids to magnetic particles can occur in solution, enhancing contact with the wash buffer and increasing nucleic acid purity.

Protocols are available for Beckman Coulter instruments.

Features:

- **Improved Productivity:** Manual and automated 96-well protocols cut purification time compared to CTAB extraction.
- **Ease of Handling:** Eliminates organic extractions, multiple centrifugations and cumbersome filter plates.
- **Confidence in Applications Performance:** Validated for both leaf and seed tissue by PCR and RAPD analysis.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Wizard® Magnetic DNA Purification System for Food

Product	Size	Cat.#
Wizard® Magnetic DNA Purification System for Food	200 preps	FF3750
	400 preps	FF3751
Available Separately	**Size**	**Cat.#**
Lysis Buffer A, Food	100 ml	A8191
Lysis Buffer B, Food	100 ml	Z3191
Precipitation Solution, Food	150 ml	Z3201

A8191, Z3191, Z3201 For Research Use Only. Not for Use in Diagnostic Procedures. FF3750, FF3751 For in vitro use only.

Description: The Wizard® Magnetic DNA Purification System for Food is designed for purification of DNA from a variety of food samples including corn seeds, cornmeal, soybeans, soy flour and soy milk. Processed food, such as corn chips, chocolate and chocolate-containing foods, lecithin and vegetable oils may also be used with the suggested protocol variations. The DNA purified from these samples can be used in PCR-based testing for genetically modified organism (GMO) DNA sequences.

Features:

- **Improved Productivity:** Obtain results in one-third the time of current methods.
- **Ease of Handling:** Requires minimal centrifugation and eliminates organic extractions.
- **Versatility and Robustness:** Validated with a broad variety of foodstuffs, including difficult samples such as lecithin and vegetable oils.

Storage Conditions: Store at 22–25°C.

Maxwell® 16 System DNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV Blood DNA Kit	48 preps	AS1290
Maxwell® 16 FFPE Plus LEV DNA Purification Kit	48 preps	AS1135
Maxwell® 16 Cell LEV DNA Purification Kit	48 preps	AS1140
Maxwell® 16 Buccal Swab LEV DNA Purification Kit	48 preps	AS1295
Maxwell® 16 Viral Total Nucleic Acid Purification System	48 preps	AS1155
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit	48 preps	AS1130
Standard Elution Volume (SEV)		
Maxwell® 16 Blood DNA Purification Kit	48 preps	AS1010
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015
Maxwell® 16 Cell DNA Purification Kit	48 preps	AS1020
Maxwell® 16 Tissue DNA Purification Kit	48 preps	AS1030
Maxwell® 16 Mouse Tail DNA Purification Kit	48 preps	AS1120
Available Separately		
Maxwell® 16 Instrument	1 each	AS2000
Maxwell® 16 MDx Instrument	1 each	AS3000
LEV Plungers	50 /pk	AS6101
Elution Tubes (LEV)	50 /pk	AS6201
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
Elution Buffer, Blood	45 ml	MD1421
Plungers (SEV)	50 /pk	AS5201
Elution Tubes (SEV)	50 /pk	AS5101

AS1290, AS1135, AS1140, AS1295, AS1150, AS1010, AS1020, AS1030, AS1120 For Laboratory Use. AS2000, AS3000, AS6101, AS6201, V1231, V4741, MD1421, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures. AS1015, AS1155 For In Vitro Diagnostics Use. This product is only available in certain countries.

Description: The Maxwell® 16 Genomic DNA Purification Kits are designed for use with the Maxwell® 16 Instrument. DNA purification kits are provided with corresponding optimized automated methods. You get consistent yield and purity from easy-to-use automation.

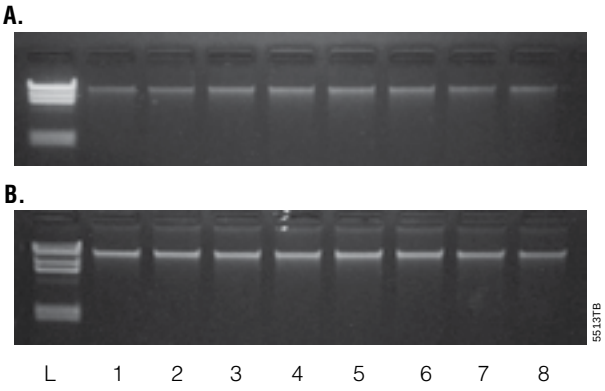
For genomic DNA purification, the Maxwell® 16 System is the only system that makes purification from tissue as easy as purification from blood or cells. The action of the plunger grinds solid tissue samples directly in the lysis buffer in the prefilled reagent cartridges. Integrated grinding replaces time- and labor-intensive use of lytic enzymes such as proteinase K or manual tissue grinding prior to purification.

Kits for optimized DNA purification from eukaryotic tissue, blood, cells, mouse tail and FFPE tissue sections are available. Protocols for a variety of new samples are being developed. The Maxwell® 16 DNA Purification Kits are General Purpose Medical Devices (GPR) in the USA. For up-to-date information visit: **www.promega.com/maxwell16/**

Features:

- **Achieve High Yield:** Efficient processing and higher sample capacity than comparable systems.
- **Enjoy Amazing Speed:** Hands-free purification of genomic DNA in 18–30 minutes.
- **Get More Time:** Easily process tissues and cells.

Maxwell® 16 Instrument (Cat.# AS3000) with optional bar code reader.



Genomic DNA purified from 8 samples of 200µl of whole human blood (Panel A) and 8 samples of 1cm of mouse tail (Panel B) was visualized on a 1% agarose gel stained with ethidium bromide. Lane L, Lambda DNA/HindIII Markers (Cat.# G1711); Lanes 1–8, 5µl of purified genomic DNA.

DNA Yields from Various Starting Materials.

Sample Type	Sample Size	Yield
Whole blood	200µl	4–9µg (>3pg/white blood cell)
Whole blood	400µl	8–15µg (>3pg/white blood cell)
Mouse tail	1.2cm	20µg
Animal tissue	20–25mg	60–100µg (mouse liver)
Tissue culture cells	5×10^6	10µg (HeLa)
Gram– bacteria	2×10^9	10µg (BL21)
Gram+ bacteria	2×10^9	1µg (*B. cereus*)
Plant leaf (tomato)	25mg	10µg

9482LA

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Plasmid Purification

Wizard® *Plus* SV Minipreps DNA Purification Systems

Product	Size	Cat.#
Wizard® *Plus* SV Minipreps DNA Purification System	50 preps	A1330
	250 preps	A1460
	1,000 preps	A1465
Wizard® *Plus* SV Minipreps DNA Purification System + Vacuum Adapters	50 preps	A1340
	250 preps	A1470
Available Separately	**Size**	**Cat.#**
Column Wash Solution (CWA)	185 ml	A1311
Alkaline Protease Solution	3 ml	A1441
Vacuum Adapters	20 each	A1331

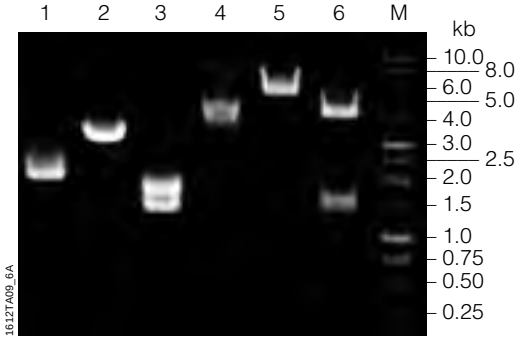
A1311 For Laboratory Use. A1330, A1340, A1460, A1465, A1470, A6762, A1441, A1331, A6760, A6764 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® *Plus* SV Minipreps DNA Purification System, a silica membrane-based system, provides a simple and reliable method for rapid isolation of plasmid DNA. The entire miniprep procedure can be completed in 45 minutes or less, depending on the number of samples processed. Using the system, plasmid DNA can be purified from 1–10ml of overnight *E. coli* culture. The purified plasmid DNA can be used directly for automated fluorescent BigDye® terminator DNA sequencing as well as for other standard molecular biology techniques without further manipulation. It also can be used for in vitro transcription reactions when supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

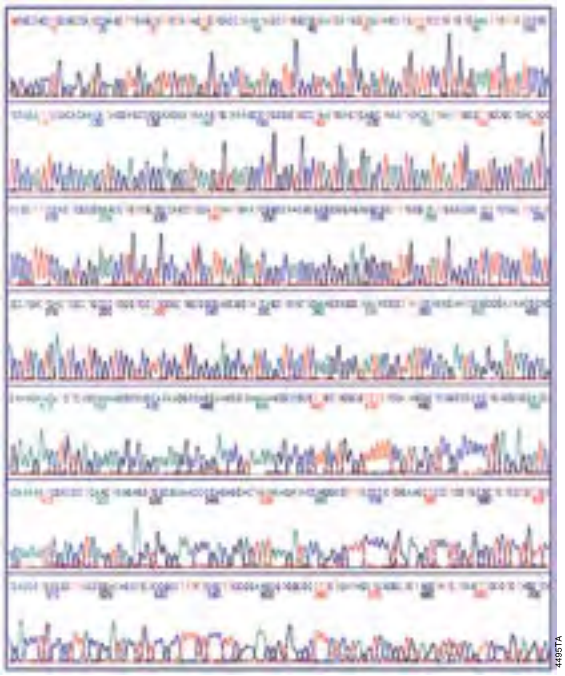
Features:

- **Improved Productivity:** 20 minipreps processed in less than 45 minutes.
- **High Performance:** 1–20µg of high-quality plasmid DNA, enough for multiple applications.
- **Safety and Convenience:** No phenol extractions or precipitations required.
- **Flexibility:** Choice of spin (microcentrifuge) or vacuum purification formats.
- **Consistent Quality:** Alkaline protease step improves plasmid quality.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 500 bases using pGEM®-3Zf(+) Vector in BigDye® terminator sequencing.

Storage Conditions: Store at 22–25°C.



High-quality restriction digests using plasmid purified with the Wizard® *Plus* SV Minipreps DNA Purification System. High-copy pGEM®-3Zf(+) Vector (lanes 1–3) and low-copy pALTER®-1 Vector (lanes 4–6) were each digested in two separate Promega restriction enzyme reactions. All lanes show reproducible and efficient cutting of the plasmid DNA. Lane M is the 1kb DNA Ladder (Cat.# G5711).



pGEM®-3Zf(+) plasmid sequenced with the T7 Promoter Primer (Cat.# Q5021) using DNA purified with the Wizard® *Plus* SV Minipreps DNA Purification System.

PureYield™ Plasmid Miniprep System

Product	Size	Cat.#
PureYield™ Plasmid Miniprep System	100 preps	A1223
	250 preps	A1222

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PureYield™ Plasmid Miniprep System is designed to rapidly isolate highly pure plasmid DNA. The system provides a rapid method for purification of up to 15µg of plasmid DNA from 600µl to 3ml of bacteria culture. Plasmid DNA can be purified in as little as 10 minutes. The PureYield™ Plasmid Miniprep System incorporates a unique Endotoxin Removal Wash designed to remove substantial amounts of protein, RNA and endotoxin contaminants from purified plasmid DNA. Removal of contaminants improves the robustness of sensitive applications such as eukaryotic transfection, in vitro transcription and coupled in vitro transcription/translation (e.g., TNT® Quick Coupled Transcription/Translation System). Purification is achieved without isopropanol precipitation of purified plasmid DNA or extensive centrifugation, providing rapid purification from a single method.

The system has been designed for use with centrifugation or vacuum (e.g., the Vac-Man® Laboratory Vacuum Manifold).

Features:

- **Improved Productivity:** Rapid protocol purifies plasmid DNA in 10 minutes.
- **Robust Performance:** High purity and concentration of plasmid DNA gives proven performance in transfection, cell-free expression and other molecular biology applications.
- **Confidence in Results:** Lysis/neutralization indicator dye ensures success every time.
- **Flexible:** Centrifugation and vacuum protocols are available.

Storage Conditions: Store all system components at 22–25°C.

PureYield™ Plasmid Midiprep System

Product	Size	Cat.#
PureYield™ Plasmid Midiprep System	25 preps	A2492
	100 preps	A2495
	300 preps	A2496
Available Separately	**Size**	**Cat.#**
Cell Resuspension Solution (CRA)	315 ml	A7115
Cell Lysis Solution (CLA)	315 ml	A7125
Neutralization Solution (NSB)	500 ml	A1485
Eluator™ Vacuum Elution Device	4 each	A1071

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PureYield™ Plasmid Midiprep System is designed to isolate transfection-quality plasmid DNA. The system provides a rapid method for purification of 100–200µg of plasmid DNA from 50ml bacteria culture. Plasmid DNA can be purified in as little as 30 minutes with the vacuum protocol, greatly reducing the time spent on purification compared to silica resin or other membrane-column methods. An alternative protocol allows purification of over 400µg of high-copy-number plasmid from 250ml of *E. coli* culture.

The PureYield™ Plasmid Midiprep System incorporates a unique Endotoxin Removal Wash designed to remove substantial amounts of protein, RNA and endotoxin contaminants from purified plasmid DNA. Removal of contaminants improves the robustness of sensitive applications such as eukaryotic transfection, in vitro transcription and coupled in vitro transcription/translation (e.g., TnT® Quick Coupled Transcription/Translation System). Purification is achieved without isopropanol precipitation of purified plasmid DNA or extensive centrifugation, providing rapid purification from a single method.

The system has been designed for use with centrifugation or vacuum (e.g., the Vac-Man® Laboratory Vacuum Manifold).

The Eluator™ Vacuum Elution Device is used to elute nucleic acids from PureYield™ Midiprep or Maxiprep columns. It consists of two pieces, a blue base and a clear column assembly. The base interfaces with a Vacuum Manifold that contains Luer-Lok® fittings, such as the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231), and holds a 1.5ml tube to capture the eluted nucleic acids. The column assembly accepts PureYield™ Midiprep or Maxiprep columns.

The Eluator™ Device eliminates the requirement for a centrifuge with a swinging bucket rotor for nucleic acid purification, simplifying and speeding purification protocols.

Features:

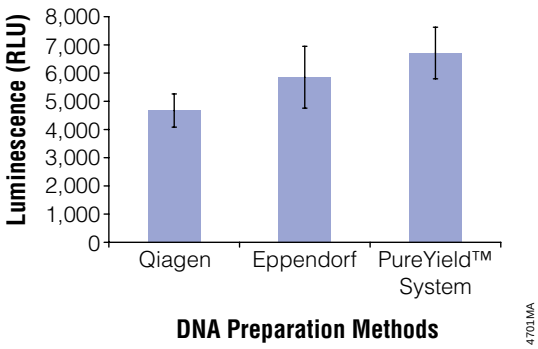
- **Improved Productivity:** Vacuum protocol allows plasmid DNA purification in as little as 30 minutes.
- **Confidence in Results:** High purity and concentration of plasmid DNA gives proven performance in transfection, in vitro expression and other molecular biology applications.
- **Ease of Use:** Simple protocol eliminates tedious high-speed centrifugation, gravity-drip columns, and post-elution alcohol precipitation.
- **Flexibility:** PureYield™ membrane column allows purification of large amounts of plasmid DNA, exceeding the capabilities of other midiprep systems.

Storage Conditions: Store all system components at 22–25°C.

Midiprep

Comparison of time required per midiprep for different systems. Each system protocol was performed according to the manufacturer's instructions using 50ml of an overnight culture of JM109 bacteria transformed with high-copy-number plasmid [pGEM®-3Zf(+) Vector, Cat.# P2271]. Total time to perform midiprep is noted.

PureYield™ Plasmid Midiprep System. Proper assembly of Lysate Clearing Column (blue) and DNA Binding Column (white) for use with the DNA Purification by Vacuum protocol.



Comparison of transfection of plasmid DNA purified with the PureYield™ System and other midiprep systems. psiCHECK™-2 Vector (Cat.# C8021), which carries a firefly luciferase gene, was isolated from *E. coli* using the PureYield™ System, the Qiagen HiSpeed® Plasmid Midi Kit or the Eppendorf Perfectprep® Plasmid Midi Kit. HeLa cells were transfected using 0.07µg of DNA in a total of 25µl. The firefly luciferase signal was monitored with the Dual-Glo™ Luciferase Assay System (Cat.# E2920).

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PureYield™ Plasmid Maxiprep System

Product	Size	Cat.#
PureYield™ Plasmid Maxiprep System	10 preps	A2392
	25 preps	A2393
Available Separately	**Size**	**Cat.#**
Eluator™ Vacuum Elution Device	4 each	A1071

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PureYield™ Plasmid Maxiprep System isolates transfection-quality plasmid DNA. The system provides a rapid method for purification of up to 1mg of plasmid DNA from a 250ml bacterial culture. Plasmid DNA can be purified rapidly with the vacuum protocol, greatly reducing the time spent on purification compared to silica resin or other membrane-column methods.

The PureYield™ Plasmid Maxiprep System incorporates a unique Endotoxin Removal Wash designed to remove substantial amounts of protein, RNA and endotoxin contaminants from purified plasmid DNA. Removal of contaminants improves the robustness of sensitive applications such as eukaryotic transfection, in vitro transcription and coupled in vitro transcription/translation (e.g., TnT® Quick Coupled Transcription/Translation System). Purification is achieved without isopropanol precipitation of purified plasmid DNA.

The system has been designed for use with a vacuum source and vacuum manifold (e.g., the Vac-Man® Laboratory Vacuum Manifold).

The Eluator™ Vacuum Elution Device is used to elute nucleic acids from PureYield™ Midiprep or Maxiprep columns. It consists of two pieces, a blue base and a clear column assembly. The base interfaces with a Vacuum Manifold that contains Luer-Lok® fittings, such as the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231), and holds a 1.5ml tube to capture the eluted nucleic acids. The column assembly accepts PureYield™ Midiprep or Maxiprep columns.

The Eluator™ Device eliminates the requirement for a centrifuge with a swinging bucket rotor for nucleic acid purification, simplifying and speeding purification protocols.

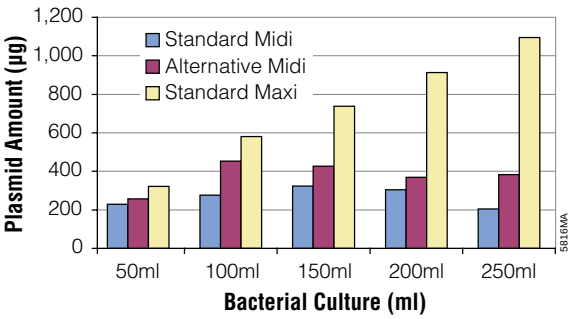
Features:

- **Improved Productivity:** Vacuum protocol simplifies purification of multiple samples at one time.
- **Confidence in Results:** High purity and concentration of plasmid DNA gives proven performance in transfection, in vitro expression and other molecular biology applications.
- **Ease of Use:** Simple protocol eliminates tedious, gravity-drip columns and post-elution alcohol precipitation.
- **Flexibility:** PureYield™ membrane column allows purification of large amounts of plasmid DNA, exceeding the capabilities of other maxiprep systems.

Storage Conditions: Store at 22–25°C.

Maxiprep

Comparison of time required per prep using different systems. PureYield™ system protocols were performed according to the instructions using 250ml overnight cultures of JM109 bacteria transformed with a high-copy-number plasmid. Total times to perform the PureYield™ preps are noted. Other times are estimated based on protocols.



Plasmid yield from various culture volumes using the PureYield™ Maxiprep and Midiprep Systems. Increasing amounts of JM109 containing the phMGFP plasmid were grown and processed using the PureYield™ Plasmid Systems. Lysate was prepared using the midiprep standard vacuum protocol, the midiprep alternative lysate clearing protocol and the standard maxiprep protocol. The midiprep standard protocol is recommended only for 50ml cultures.

Wizard® *Plus* Minipreps DNA Purification Systems

Product	Size	Cat.#
Wizard® *Plus* Minipreps DNA Purification System	50 preps	A7100
	100 preps	A7500
	250 preps	A7510
Available Separately	**Size**	**Cat.#**
Cell Resuspension Solution (CRA)	150 ml	A7112
Wizard® Minipreps DNA Purification Resin	250 ml	A7141
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Minicolumns	250 each	A7211

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The resin-based Wizard® *Plus* Minipreps DNA Purification System provides a simple and reliable method for rapid isolation of plasmid DNA. When using the standard protocol, the entire miniprep process can be completed in 15 minutes or less, with no organic extractions or ethanol precipitations. Minipreps may be processed individually or in multiples with the Vac-Man® (20-sample capacity, Cat.# A7231) or Vac-Man® Jr. (2-sample capacity, Cat.# A7660) Laboratory Vacuum Manifold. DNA is eluted from the Wizard® Minicolumn in Nuclease-Free Water (Cat.# P1193). The purified plasmid can be used directly for automated fluorescent DNA sequencing and restriction digestion without further manipulation and also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor, such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

The Wizard® Minipreps DNA Purification Resin is used in the isolation and preparation of plasmid DNA in conjunction with the Wizard® *Plus* Minipreps DNA Purification Systems. The resin is available with the systems and as a standalone product.

Features:

- **High Performance:** DNA is suitable for most molecular biology applications, including fluorescent sequencing.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 500 bases using pGEM®-3Zf(+) Vector in BigDye® terminator sequencing.
- **Fast:** Entire procedure may be completed in 15 minutes or less.
- **Convenient:** No phenol extractions or ethanol precipitations required.

Storage Conditions: Store at 22–25°C.

Wizard® *Plus* Midipreps DNA Purification System

Product	Size	Cat.#
Wizard® *Plus* Midipreps DNA Purification System	25 preps	A7640
Available Separately	**Size**	**Cat.#**
Cell Resuspension Solution (CRA)	150 ml	A7112
Wizard® Midipreps DNA Purification Resin	1,000 ml	A7701
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Midicolumns	100 each	A7651

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The resin-based Wizard® *Plus* Midipreps DNA Purification System provides a simple and reliable method for rapid isolation of plasmid DNA. When using the standard protocol, the entire midiprep process can be completed in 90 minutes or less, yielding up to 200µg of high-quality DNA with no organic extractions or ethanol precipitations. Multiple midipreps can be easily processed at one time with the Vac-Man® (20-sample capacity, Cat.# A7231) or Vac-Man® Jr. (2-sample capacity, Cat.# A7660) Laboratory Vacuum Manifold. DNA is eluted from the Wizard® Midicolumn in Nuclease-Free Water (Cat.# P1193). The purified plasmid can be used directly for automated fluorescent DNA sequencing or restriction digestion without further manipulation and also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511). The system includes sufficient reagents for 25 DNA isolations from 10–100ml of liquid culture.

Features:

- **Fast:** Rapid batch column method used for DNA isolation.
- **Safe:** Eliminates the need for cesium chloride:ethidium bromide gradient centrifugation and does not require organic extractions.
- **Reliable:** Yields plasmid DNA of comparable quantity and quality to cesium chloride:ethidium bromide gradient techniques that are much more time- and labor-intensive.
- **High Performance:** DNA is suitable for restriction enzyme digestions, automated fluorescent DNA sequencing, transformation and subcloning.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 500 bases using pGEM®-3Zf(+) Vector in BigDye® terminator sequencing.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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Wizard® *Plus* Maxipreps DNA Purification System

Product	Size	Cat.#
Wizard® *Plus* Maxipreps DNA Purification System	10 preps	A7270
Available Separately	**Size**	**Cat.#**
Cell Resuspension Solution (CRA)	150 ml	A7112
Wizard® Maxipreps DNA Purification Resin	500 ml	A7401
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Maxi/Megapreps Filtering System	50 each	A7421

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® *Plus* Maxipreps DNA Purification System provides a simple and rapid resin-based batch column method for purification of plasmid DNA that eliminates the need for cesium chloride:ethidium bromide gradient centrifugation. Use of this system requires only a centrifuge, a vacuum source and a vacuum manifold. This system typically yields 300µg–1mg of high-copy-number plasmid DNA (200–20,000bp) from a 100–500ml culture in less than three hours. The purified DNA is eluted in Nuclease-Free Water (Cat.# P1193) and can be used directly for DNA sequencing and restriction digestion without further manipulation. The DNA also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

Features:

- **Flexible:** DNA is suitable for restriction enzyme digestions, automated fluorescent DNA sequencing, transformation and subcloning.
- **High Quality:** Yields plasmid DNA of comparable quantity and quality to cesium chloride:ethidium bromide gradient techniques that are much more time- and labor-intensive.
- **Fast:** Rapid batch binding and column washing method used for DNA isolation.
- **Safe:** Eliminates the need for cesium chloride:ethidium bromide gradient centrifugation and does not require organic extractions.

Storage Conditions: Store at 22–25°C.

Wizard® *Plus* Megapreps DNA Purification System

Product	Size	Cat.#
Wizard® *Plus* Megapreps DNA Purification System	5 preps	A7300
Available Separately	**Size**	**Cat.#**
Cell Resuspension Solution (CRA)	150 ml	A7112
Wizard® Megapreps DNA Purification Resin	1,000 ml	A7361
Cell Lysis Solution (CLA)	150 ml	A7122
Neutralization Solution (NSA)	150 ml	A7131
Column Wash Solution (CWB)	125 ml	A8102
Wizard® Maxi/Megapreps Filtering System	50 each	A7421

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Wizard® *Plus* Megapreps DNA Purification System provides a simple and rapid method for large-scale purifications of plasmid DNA that eliminates the need for cesium chloride:ethidium bromide gradient centrifugation. Use of this system requires only a centrifuge, a vacuum source and a vacuum manifold. The system yields greater than one milligram of high-copy-number plasmid DNA (200–20,000bp) from a 1,000ml culture in less than three hours. The purified DNA is eluted in Nuclease-Free Water (Cat.# P1193) or TE buffer and can be used directly for DNA sequencing and restriction digestion without further manipulation. The DNA also can be used for in vitro transcription reactions supplemented with a ribonuclease inhibitor such as Recombinant RNasin® Ribonuclease Inhibitor (Cat.# N2511).

Features:

- **Fast:** Rapid batch binding and column washing method used for DNA isolation.
- **Safe:** Eliminates the need for cesium chloride:ethidium bromide gradient centrifugation and does not require organic extractions.
- **Reliable:** Yields plasmid DNA of comparable quantity and quality to cesium chloride:ethidium bromide gradient techniques that are much more time- and labor-intensive.
- **Yield:** Each megaprep produces >1mg of DNA from 1,000ml of bacterial culture when using a high-copy-number plasmid.
- **Quality:** DNA is suitable for restriction enzyme digestions, automated fluorescent DNA sequencing, transformation and subcloning.

Storage Conditions: Store at 22–25°C.

Wizard® SV 96 and SV 9600 Plasmid DNA Purification Systems

Product	Size	Cat.#
Wizard® SV 96 Plasmid DNA Purification System	1 × 96 preps	A2250
	5 × 96 preps	A2255
Wizard® SV 9600 Plasmid DNA Purification System	100 × 96 preps	A2258
Available Separately	**Size**	**Cat.#**
Column Wash Solution (CWA)	185 ml	A1311
Column Wash Solution (CWA)	370 ml	A1318
Wizard® SV 96 Neutralization Solution	500 ml	A1481
	950 ml	A1488
Wizard® SV 96 Cell Resuspension Solution	500 ml	A7113
Nuclease-Free Water	150 ml	P1195
Wizard® SV 96 Cell Resuspension Solution	800 ml	A7118
Wizard® SV 96 Cell Lysis Solution	500 ml	A7123
	800 ml	A7128
Alkaline Protease Solution	3 ml	A1441
Wizard® SV 96 Binding Plates	10 pack	A2271
	100 pack	A2278
Wizard® SV 96 Lysate Clearing Plates	10 pack	A2241
	100 pack	A2248

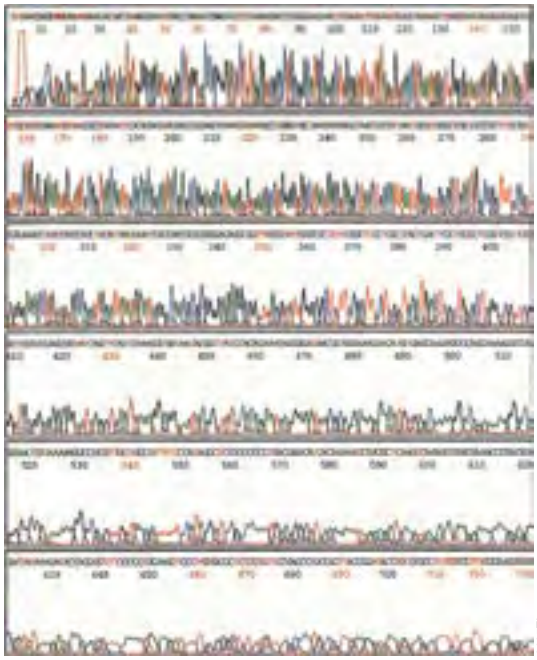
A1311 For Laboratory Use. A2250, A2255, A2258, A1318, A1481, A1488, A7113, P1195, A7118, A7123, A7128, A1441, A2271, A2278, A2241, A2248 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® SV 96 and SV 9600 Plasmid DNA Purification Systems provide a simple and reliable method for the rapid isolation of plasmid DNA using a silica-membrane, 96-well, high-throughput format. A single plate can be processed in 60 minutes or less. The purified plasmid can be used directly for automated fluorescent DNA sequencing as well as for other standard molecular biology techniques, including restriction enzyme digestion. The Wizard® SV 96 and SV 9600 Systems are designed for use either in a manual format or with Beckman Coulter or PerkinElmer automated instruments.

Features:

- **Performance by Design:** Vac-Man® 96 Vacuum Manifold eliminates waste handling and allows simultaneous lysate clearing and DNA binding. Novel plate design prevents cross-contamination during sample processing.
- **Flexibility:** Designed for use in both manual and automated formats.
- **Confidence in Results:** Purified DNA meets a target of >98% accuracy over 600 bases using pGEM®-3Zf(+) Vector DNA in BigDye® terminator sequencing.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.



Electropherogram of plasmid DNA sequence following isolation by the Wizard® SV 96 System and cycle sequencing using BigDye® terminator reactions. Results demonstrate greater than 600 consecutive bases analyzed with greater than 98% accuracy of base identity.

Available in the Helix® on-site stocking system

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Wizard® MagneSil® Plasmid Purification System

Product	Size	Cat.#
Wizard® MagneSil® Plasmid Purification System	4 × 96 preps	A1630
	8 × 96 preps	A1631
Wizard® MagneSil® Plasmid Purification System, HTP1	100 × 96 preps	A1635
Available Separately	**Size**	**Cat.#**
MagneSil® RED	100 ml	A1641
MagneSil® BLUE	100 ml	A2201
Cell Resuspension Solution	500 ml	A7114
Cell Lysis Solution	500 ml	A7124
Neutralization Solution	500 ml	A7132
Elution Buffer	500 ml	A1655
Collection Plates (4-pack)	1 each	A9161

For Research Use Only. Not for Use in Diagnostic Procedures.

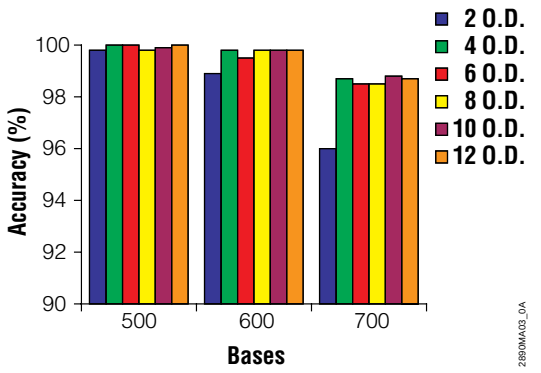
Description: The Wizard® MagneSil® Plasmid DNA Purification System provides a simple and reliable method for the rapid isolation of plasmid DNA in a 96-well, high-throughput format. The purified plasmid can be used directly for automated fluorescent sequencing, such as with BigDye® terminator sequencing chemistry, as well as for other standard molecular biology techniques including restriction enzyme digestion.

The use of the MagneSil® Paramagnetic Particles for lysate clearing (BLUE) as well as DNA capture (RED) circumvents the need for centrifugation or vacuum manifolds, making the system ideal for full automation on a Beckman Coulter or Tecan instrument.

Features:

- **Improve Productivity:** Process multiple plates without user intervention.
- **Gain Confidence:** Consistent performance in fluorescent sequencing reactions.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.



Accuracy by read length for plasmid DNA sequenced following isolation using Wizard® MagneSil® Plasmid Purification System. Results demonstrate >700 consecutive bases analyzed with >98% accuracy of base identity.

Wizard MagneSil Tfx™ System

Product	Size	Cat.#
Wizard MagneSil Tfx™ System	4 × 96 preps	A2380
Available Separately	**Size**	**Cat.#**
Endotoxin Removal Resin	100 ml	A2191
4/40 Wash Solution	115 ml	A2221

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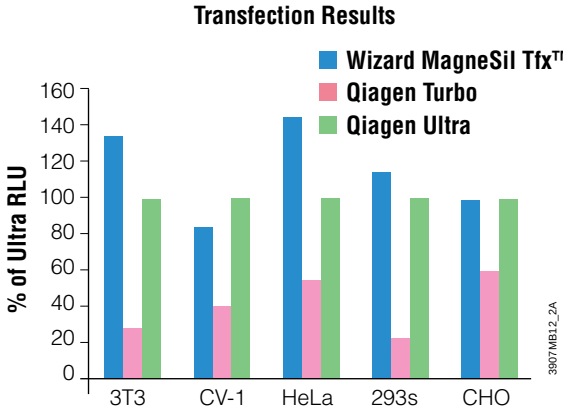
Description: The Wizard MagneSil Tfx™ System provides a simple and reliable method for the rapid isolation of transfection-quality plasmid DNA in a 96-well, high-throughput format. The use of MagneSil® Paramagnetic Particles for lysate clearing as well as DNA capture circumvents the need for centrifugation or vacuum manifolds, allowing DNA purification with the Wizard MagneSil Tfx™ System to be completely automated.

An automated method has been developed for use of this product with a Beckman Coulter Biomek® FX robotic workstation. This procedure requires approximately 45 minutes to process a single 96-well plate. The method can be adapted to other robotic workstations, such as the Beckman Coulter Biomek® 2000 or the Tecan Genesis® instrument.

Features:

- **Improve Transfection Results:** Use of Endotoxin Removal Resin cuts endotoxin carryover as much as 95% over standard sequencing-grade automated plasmid systems.
- **Enhance Mammalian Protein Expression:** Three- to fivefold increase in protein expression compared to plasmid isolated from an automated sequencing-grade plasmid purification system.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.



A comparison of transfection efficiencies for different DNA purification systems with various cell lines. A variety of eukaryotic cell lines were transfected with pGL3-Control Vector purified using the Wizard MagneSil Tfx™ System or Qiagen Turbo or Ultra systems. Transfection efficiency was determined by measuring firefly luciferase luminescence, and the results were normalized to those for the Qiagen Ultra system.

ReliaPrep™ FFPE Total RNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE Total RNA Miniprep System	10 reactions	Z1001
	100 reactions	Z1002
Available Separately	**Size**	**Cat.#**
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

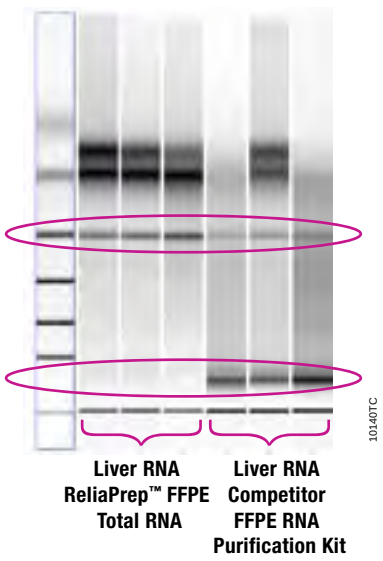
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE Total RNA Miniprep System provides a complete, all-inclusive method for purification of quality total RNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Total RNA can be isolated from FFPE tissue in approximately one and one-half hours with minimal hands-on time.

Features:

- **Easy to Use:** Minimal preparation time.
- **Safe:** Deparaffinization step occurs without harsh organic solvents.
- **Isolate Quality, Intact Total RNA:** Fine-tuned protocol results in high-quality, intact, amplifiable total RNA.

Storage Conditions: Store at room temperature.



Total RNA purified from sequential 10µm mouse liver FFPE sections analyzed on an Agilent Bioanalyzer. More large-fragment RNA was purified with the ReliaPrep™ FFPE Total RNA Miniprep System than competitor kits.

ReliaPrep™ RNA Miniprep Systems

Product	Size	Cat.#
ReliaPrep™ RNA Cell Miniprep System	10 preps	Z6010
	50 preps	Z6011
	250 preps	Z6012
ReliaPrep™ RNA Tissue Miniprep System	10 preps	Z6110
	50 preps	Z6111
	250 preps	Z6112

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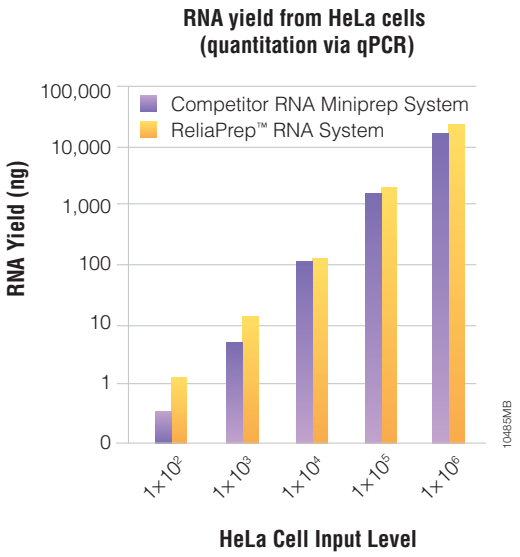
Description: The ReliaPrep™ RNA Miniprep Systems provide a fast and simple technique for preparation of intact total RNA from cultured cells or tissue in as little as 30 minutes. The proprietary column/binding matrix can efficiently capture RNA from very small amounts of input material, isolating RNA eluted in a minimal volume (less than 15µl). Using this membrane-based purification system, from 100 to 5 × 10^6 cultured cells or from 0.25 to 20mg of tissue can be processed per purification. The system incorporates a DNase treatment step directly on the minicolumn membrane and effectively removes substances that can inhibit downstream assays. Purification is achieved without the use of phenol:chloroform extractions or ethanol precipitations, resulting in pure RNA that does not require additional purification or concentration of the RNA for use in demanding applications.

Features:

- **Be Efficient:** Allows use of hard-to-obtain samples.
- **Have Confidence:** Provides maximum sensitivity for downstream assays without worry of inhibition when measuring low-copy-number targets.
- **Save Effort:** No need to further concentrate samples for use.
- **Save Time:** Rapid protocol and provided DNase reagents streamline laboratory processes.

Storage Conditions: Store at 15–30°C.



Purified RNA quantitated using TaqMan® qPCR assay with the GAPDH gene as the target.

Available in the Helix® on-site stocking system

SV Total RNA Isolation System

Product	Size	Cat.#
SV Total RNA Isolation System	10 preps	Z3101
	50 preps	Z3100
	250 preps	Z3105
Available Separately	**Size**	**Cat.#**
Red Blood Cell Lysis Solution (CLB)	200 ml	Z3141
RNA Lysis Buffer (RLA)	50 ml	Z3051

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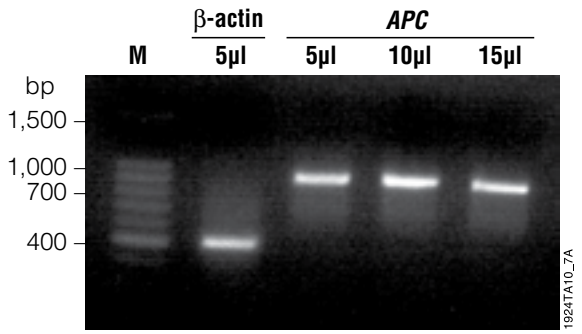
Available in the Helix® on-site stocking system

Description: The SV Total RNA Isolation System provides a fast and simple technique for preparation of intact total RNA from tissues, cultured cells and white blood cells in as little as one hour. Using this membrane-based purification system, up to 60mg of tissue can be processed per purification, depending on tissue type. The system incorporates a DNase treatment step directly on the minicolumn membrane. This step substantially reduces genomic DNA contamination, which can interfere with amplification-based methodologies. Purification is achieved without the use of phenol:chloroform extractions or ethanol precipitations, and there is no DNase carryover in the final RNA preparation.

Features:

- **Safety and Efficiency:** Rapid isolation of high yields of total RNA without the use of hazardous compounds like phenol.
- **Flexibility:** Single system for isolation directly from blood, cells or tissue. Two methods available for purification: microcentrifugation (spin) or vacuum.
- **Confidence:** Purified RNA suitable for all routine molecular biology applications, including RT-PCR and Northern blotting.

Storage Conditions: Store at 22–25°C.



RNA was isolated from 1ml of human blood using the SV Total RNA Isolation System. RT-PCR was performed using the indicated volumes of eluted RNA and primers complementary to human β-actin or human *adenomatous polyposis coli (APC)* gene with the Access RT-PCR System (Cat.# A1250). Lane M = 100bp DNA Ladder (Cat.# G2101).

Average Yields of Total RNA Isolated Using SV Total RNA Isolation System.

Samples	Maximum Amt. to Process	Avg. Yield per Prep (µg)	Avg. Yield per mg Tissue (µg)	A_{260}/A_{280}
Mouse Tissues				
Liver	30mg	131	4.4	1.9
Kidney	20mg	44	2.2	1.9
Spleen	15mg	79	5.3	1.9
Brain	60mg	39	0.65	2.1
Muscle	30mg	22	0.73	2.1
Rat Tissues				
Pancreas	30mg	100	3.5	1.9
Heart	60mg	16	0.27	2.1
Lung	60mg	36	0.6	2.1
Bacteria				
E. coli	1×10^9 cells	36	N/A	2.0
Yeast				
S. cerevisiae	4×10^7 cells	19	N/A	2.1
Plant				
Tomato Leaf	30mg	4.6	0.15	2.0
Cell Line				
RAW264.7	5×10^6 cells	51	N/A	2.1

N/A = Not applicable

9485LA

PureYield™ RNA Midiprep System

Product	Size	Cat.#
PureYield™ RNA Midiprep System	10 preps	Z3740
	50 preps	Z3741
Available Separately	**Size**	**Cat.#**
RNA Lysis Buffer (RLA)	50 ml	Z3051
RNA Wash Solution (RWA)	58.8 ml	Z3091
Red Blood Cell Lysis Solution (CLB)	200 ml	Z3141
Eluator™ Vacuum Elution Device	4 each	A1071

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Description: The PureYield™ RNA Midiprep System isolates intact, pure total RNA from essentially any sample type for use in a wide range of applications. The use of a novel Clearing Agent rapidly purifies total RNA with undetectable levels of genomic DNA contamination without using DNase. A novel combination of reagents, membranes and protocol yields up to 1mg of total RNA without organic solvents, protease digestions or alcohol precipitations. One kit can be used to isolate pure total RNA from a wide variety of sample types, such as tissues, cultured cells, bacteria, yeast, plants and blood. The protocol also can be adapted for other sample types.

Commonly used methods provide total RNA that is contaminated with genomic DNA. This contamination can interfere with sensitive methods, such as real-time RT-PCR and microarray analysis. The PureYield™ RNA Midiprep System avoids this problem by selectively removing the genomic DNA prior to total RNA purification. The eluted total RNA is free of detectable DNA and ready for use in sensitive downstream applications.

The system has been designed for use with centrifugation or vacuum (e.g., the Vac-Man® Laboratory Vacuum Manifold) formats.

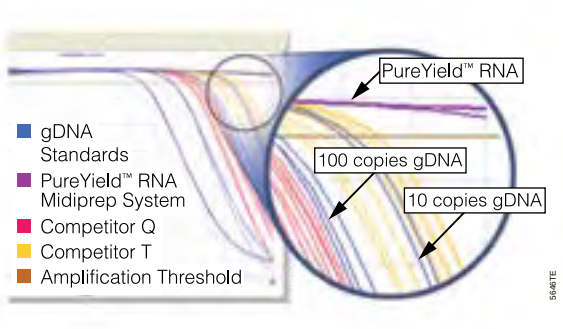
The Eluator™ Vacuum Elution Device is used to elute nucleic acids from PureYield™ Midiprep or Maxiprep columns. It consists of two pieces, a blue base and a clear column assembly. The base interfaces with a Vacuum Manifold that contains Luer-Lok® fittings, such as the Vac-Man® Laboratory Vacuum Manifold (Cat.# A7231), and holds a 1.5ml tube to capture the eluted nucleic acids. The column assembly accepts PureYield™ Midiprep or Maxiprep columns.

The Eluator™ Device eliminates the requirement for a centrifuge with a swinging bucket rotor for nucleic acid purification, simplifying and speeding purification protocols.

Features:

- **Enhanced Results:** Purified total RNA with undetectable genomic DNA contamination improves results in downstream applications.
- **Improved Productivity:** Purifying total RNA without the use of DNase treatment reduces steps during purification and in downstream applications.
- **Safety and Efficiency:** Rapid purification of high yields of total RNA without the use of hazardous organic solvents.
- **Flexibility:** Single system for purifying total RNA directly from cultured cells, bacteria, yeast, plants and other sample types.

Storage Conditions: Store the RNA Lysis Buffer (RLA) with added β-Mercaptoethanol (BME) at 4°C. Store all other components at 22–25°C.



RNA purified with the PureYield™ RNA Midiprep System has no detectable genomic DNA contamination. Total RNA was isolated from 1×10^8 HEK 293T cells using the PureYield™ RNA Midiprep System, a competitor's kit and a competitor's reagent. One hundred nanograms of each total RNA sample was assayed using the Plexor® qPCR System (Cat.# A4011) to detect genomic DNA contamination. Human Genomic DNA (Cat.# G3051) in quantities of 10^4, 10^3, 10^2 and 10^1 copies was used as a standard. The PureYield™ RNA Midiprep System samples showed no detectable genomic DNA. Competitor Q and Competitor T showed an average of 227 and 17 copies, respectively. The horizontal purple line in the upper right corner of this figure indicates no detectable genomic DNA in the PureYield™ RNA Midiprep System sample.

Average Yields of Total RNA Isolated from Tissues and Cells.

Sample Type	Maximum Amount to Process	Average Yield per Prep (µg)[1]	Average A_{260}/A_{230}	Average A_{260}/A_{280}
Rat Tissues				
Liver	300mg	1025.8	1.7	1.8
Lung	300mg	217.0	1.9	2.1
Bacteria				
E. coli	1×10^{10} cells	782.7	2.5	2.1
Cell Line				
HEK 293T	5×10^7 cells	453.3	2.1	1.9
HeLa	5×10^7 cells	329.2	1.8	2.0

[1] The average total RNA yield shown is from a 1ml elution. A second 1ml elution yielded an additional average of 366.4µg (rat liver), 47.0µg (rat lung), 196.8µg (*E. coli*), 45.7µg (HEK 293T cells) and 73.8µg (HeLa cells) of total RNA.

9486LA

Available in the Helix® on-site stocking system

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RNAgents® Denaturing Solution

Product	Size	Cat.#
RNAgents® Denaturing Solution	120 ml	Z5651

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: RNAgents® Denaturing Solution lyses cells or tissue under conditions that rapidly inhibit ribonucleases, using two potent inhibitors of RNase, guanidine thiocyanate and β-mercaptoethanol. The RNAgents® Denaturing Solution is designed to be used in concert with acidic phenol:chloroform and alcohol (isopropanol) for purification of total RNA.

Storage Conditions: Store at 4°C.

SV 96 Total RNA Isolation System

Product	Size	Cat.#
SV 96 Total RNA Isolation System	1 × 96 each	Z3500
	5 × 96 each	Z3505
Available Separately	**Size**	**Cat.#**
RNA Lysis Buffer (RLA)	50 ml	Z3051
RNA Wash Solution (RWA)	58.8 ml	Z3091
Wizard® SV 96 Binding Plates	10 pack	A2271
Nuclease-Free Water	150 ml	P1195

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SV 96 Total RNA Isolation System provides a high-throughput technique to prepare intact RNA from tissue and cultured cells. Total RNA can be purified from 96 samples in less than an hour without centrifugation. The system also incorporates a DNase treatment step that is designed to substantially reduce genomic DNA contamination, which can interfere with amplification-based methodologies. Purification is achieved without phenol:chloroform extraction or ethanol precipitation, and there is no detectable DNase carryover in the final RNA preparation.

Protocols are available for Beckman Coulter and PerkinElmer instruments.

Features:

- **Confidence in Results:** The product is tested to ensure that purified RNA will perform optimally in RT-PCR.
- **Unique Design:** Novel vacuum manifold eliminates waste handling. Novel plate design prevents cross-contamination during sample processing.
- **Flexibility:** The system is designed for both manual and automated formats.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Your Choice of Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the SV RNA Lysis Buffer with β-Mercaptoethanol (BME) added at 4°C. Store all other components at 22–25°C.

MagneSil® Total RNA mini-Isolation System

Product	Size	Cat.#
MagneSil® Total RNA mini-Isolation System	4 plate	Z3351

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneSil® Total RNA mini-Isolation System provides a high-throughput 96-well format for fast, simple preparation of intact total RNA from small amounts of cell culture (≤1 × 10^5 tissue culture cells), tissue (≤2mg tissue lysate in 100µl) or freshly isolated whole blood (≤20µl). The protocol enables high-throughput automated purification on a variety of liquid-handling workstations. Isolation of total RNA in a 384-well format from cell culture (≤1 × 10^3 cells) and freshly isolated whole blood (≤5µl) also may be performed. Total RNA purification is achieved without vacuum filtration, centrifugation or precipitation. The 96-well total RNA isolation procedure takes about 30 minutes to complete using a liquid-handling workstation.

Total RNA purified using this system is suitable for a variety of molecular biology applications including endpoint RT-PCR amplification and real-time RT-PCR.

Features:

- **Improve Productivity:** Only 30 minutes are required to process one 96-well plate, or 50 minutes for one 384-well plate on a Beckman Coulter Biomek® FX liquid handler.
- **Improve Real-Time PCR Performance:** Elution volumes as low as 15µl provide concentrated RNA without the need for time-consuming vacuum concentration.
- **Gain Confidence in Results:** DNase I treatment is included to remove genomic DNA contamination.
- **Achieve Convenience:** Robotic protocols require no user intervention once you start the automated robotic method.
- **Automate This Assay:** Validated automated methods are available at: **www.promega.com/automethods/**

Storage Conditions: Store at 22–25°C.

MagaZorb® Total RNA Mini-Prep Kit

Product	Size	Cat.#
MagaZorb® Total RNA Mini-Prep Kit	200 preps	MB2004
Available Separately	**Size**	**Cat.#**
20-Position Microcentrifuge Tube Magnetic Separator	1.5 ml	CD4002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagaZorb® RNA Kit provides an easy, fast and cost-effective technique for isolating PCR-quality total RNA. Using one simple protocol, a high yield of purified total RNA can be isolated from various sources including whole blood (fresh or citrate-, heparin- or EDTA-treated), buffy coat, leukocytes and tissue (fresh or frozen).

The 20-Position Microcentrifuge Tube Magnetic Separator (Cat.# CD4002) uses a microcentrifuge tube rack that can be removed from the high-strength magnets for wash steps or incubation in a water bath. The rack is designed to hold the microcentrifuge tubes so that they will not fall out even when turned upside down, and it can withstand temperatures of up to 80°C for convenient manipulation of sample tubes. Please note that the magnets in the 20-Position Microcentrifuge Tube Magnetic Separator are designed specifically for use with the MagaZorb® RNA Kit; separation may not work with other particles.

Features:

- **Convenient:** Contains all needed reagents so that no reagent preparation is required.
- **Efficient:** Eliminates the need for centrifugation, vacuum filtration or column separation, increasing sample throughput and improving reproducibility.
- **Safe:** Does not require organic solvents, eliminating the need for special storage or waste disposal.

Storage Conditions: Store at 22–25°C.

PolyATtract® System 1000

Product	Size	Cat.#
PolyATtract® System 1000 with Magnetic Stand	Scal able	Z5420
PolyATtract® System 1000 without Magnetic Stand	Scal able	Z5400
PolyATtract® System 1000 Magnetic Separation Stand	1 each	Z5410

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PolyATtract® System 1000 isolates messenger RNA directly from crude cell or tissue lysates, eliminating the need for total RNA isolations. This system uses the MagneSphere® technology for the purification of poly(A)+ RNA, eliminating the need for oligo(dT) cellulose columns. The increased yield of mRNA using this system allows the detection of low-copy-number mRNAs in relatively small amounts of material using Northern blot analysis. The isolated mRNA is suitable for all molecular biology applications, including in vitro translation, cDNA synthesis, PCR analysis, ribonuclease (RNase) protection assays, primer extension and Northern blots.

The MagneSphere® Technology Magnetic Separation Stands can be used in conjunction with any of the PolyATtract® Systems and are ideal for applications requiring multiple paramagnetic isolations of biomolecules.

Features:

- **Improved Productivity:** mRNA purification directly from tissue or cells in 45 minutes or less. Allows quick collection of magnetic particles.
- **Flexibility:** Works with tissue amounts from 5mg–2g per isolation. Magnetic separation stand (Cat.# Z5410) accommodates 1.5ml, 2ml, 15ml and 50ml tube sizes.
- **Convenience:** No lengthy ethanol precipitation steps, phenol:chloroform extractions, or overnight ultracentrifugation through cesium chloride gradients and lithium chloride (LiCl) precipitations.

Storage Conditions: Store at 4°C. Do not freeze the MagneSphere® Paramagnetic Particles.

Streptavidin MagneSphere® Paramagnetic Particles

Product	Size	Conc.	Cat.#
Streptavidin MagneSphere® Paramagnetic Particles	9 ml	1 mg/ml	Z5481
	25 ml	1 mg/ml	Z5482

For Laboratory Use.

Description: The Streptavidin MagneSphere® Paramagnetic Particles (PMPs) may be used in the magnetic separation and purification of a wide variety of biotinylated nucleic acid or protein molecules. The particles are quality-tested and approved for isolation of biotinylated nucleic acids, proteins and antibodies.

Features:

- **Confidence:** The Streptavidin MagneSphere® Paramagnetic Particles feature strong, specific binding to biotinylated molecules.
- **Improved Purity:** Enable binding, washing and magnetic separation from undesired materials in a solution.
- **Flexibility:** Applications include purification of DNA, mRNA and proteins.

Storage Conditions: Store at 4°C. Do not freeze the paramagnetic particles.

PolyATtract® mRNA Isolation Systems

Product	Size	Cat.#
PolyATtract® mRNA Isolation System I (Refill for Z5200)	3 isolations	Z5210
PolyATtract® mRNA Isolation System II with Magnetic Stand	3 isolations	Z5200
PolyATtract® mRNA Isolation System III with Magnetic Stand	15 isolations	Z5300
PolyATtract® mRNA Isolation System IV (Refill for Z5300)	15 isolations	Z5310
Available Separately	**Size**	**Cat.#**
Biotinylated Oligo(dT) Probe (50pmol/µl)	35 µl	Z5261
MagneSphere® Technology Magnetic Separation Stand (two-position)	1.5 ml	Z5332
	12 × 75 mm	Z5333

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Cat.# Z5200 contains sufficient reagents for 3 separate mRNA isolations, each from 1–5mg of total RNA. Cat.# Z5210 contains the same reagents as Cat.# Z5200, excluding the Magnetic Separation Stand. Cat.# Z5300 contains sufficient reagents for 15 separate mRNA isolations, each from 100–1,000µg of total RNA. Cat.# Z5310 contains the same reagents as Cat.# Z5300, excluding the Magnetic Separation Stand.

The PolyATtract® mRNA Isolation Systems use the MagneSphere® technology to isolate mRNA rapidly and effectively from total RNA. The systems use a biotinylated oligo(dT) primer to hybridize, at high efficiency in solution, to the 3´ poly(A)+ region present in most mature eukaryotic mRNAs. The hybrids are bound to streptavidin coupled to paramagnetic particles, captured using a magnetic separation stand and washed at high stringency. The mRNA is eluted from the solid phase by the simple addition of ribonuclease-free, deionized water. With total RNA as the starting material, poly(A)+ mRNA is isolated in approximately 45 minutes. The isolated mRNA is suitable for all molecular biology applications, including in vitro translation and cDNA synthesis.

Features:

- **Improved Productivity:** Entire mRNA purification process can be completed in approximately 45 minutes.
- **Highly Pure mRNA:** Due to the strength and selectivity of the interaction between streptavidin and biotin, mRNA bound to the biotinylated oligo(dT) is captured by streptavidin-coated magnetic particles.
- **Confidence in Your Applications:** Isolated mRNA is suitable for use with in vitro translation, RT-PCR and cDNA synthesis.
- **Flexibility:** Configurations for use with large or small amounts of cells and tissues.

Storage Conditions: Store at 4°C. Do not freeze the MagneSphere® Paramagnetic Particles.

Available in the Helix® on-site stocking system

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RNasin® Plus RNase Inhibitor

Product	Size Conc.	Cat.#
RNasin® Plus RNase Inhibitor	2,500 u 40 u/µl	N2611
	10,000 u 40 u/µl	N2615

For Laboratory Use.

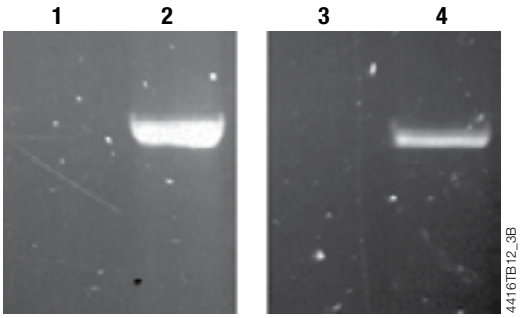
Description: RNasin® Plus RNase Inhibitor is a recombinant mammalian RNase inhibitor that is expressed as a soluble protein in *E. coli*, allowing easy purification through a combination of ion exchange and hydrophobic interaction chromatography. The protein is capable of inhibiting eukaryotic RNases (e.g., RNase A and RNase B) similarly to human placental RNase inhibitor. RNasin® Plus RNase Inhibitor is tested in RT-PCR and is compatible with enzymes such as AMV, M-MLV and ImProm-II™ Reverse Transcriptases or *Taq* and *Tfl* DNA Polymerases. RNasin® Plus RNase Inhibitor also is tested and compatible with quantitative, real-time RT-PCR in a TaqMan® assay.

The inhibitor offers increased resistance to oxidation over the human version of the protein. Two cysteines in the human protein have been identified as especially sensitive to oxidation and react by forming a disulfide bond that can block the active site of the inhibitor. RNasin® Plus, through natural amino acid diversity, lacks the ability to form this site-blocking disulfide. In addition, the new protein has characteristics never before realized, including continued inhibition of RNases above 50°C. Heating solutions of RNasin® Plus and RNase followed by cooling does not result in the reappearance of RNase activity—even when the solution is heated above the denaturation temperature of the RNasin® Plus protein alone. This allows RNasin® Plus to protect RNA species prior to, during and after heating, even at temperatures normally used during first-strand DNA synthesis in RT-PCR. We have taken solutions up to 70°C for 15 minutes and did not see RNase reactivation.

Features:

- **Improved Resistance to Oxidation:** Due to natural amino acid diversity, RNasin® Plus lacks the capability to form the active site-blocking disulfide bond that can form in the human protein under oxidative conditions.
- **Improved Purification:** RNasin® Plus is expressed by *E. coli* as a soluble protein, allowing easy purification by a combination of ion exchange and hydrophobic interaction chromatography. No direct affinity chromatography required. The new process yields a >90% pure protein with no *E. coli* RNase carryover.
- **Proven Compatibility with RT-PCR Systems:** RNasin® Plus has proven compatible with the Access and AccessQuick™ RT-PCR Systems, ImProm-II™ Reverse Transcription System and the Reverse Transcription System. Also proven compatible with TaqMan®-based RT-PCR Systems.
- **Protection During RNA Template Denaturation:** Heating mixtures of RNasin® Plus and RNase does not lead to reactivation of the RNase at temperatures even as high as 70°C for 15 minutes. Many RT-PCR protocols call for RNA template denaturation (e.g., 65–70°C for 5–10 minutes) in the presence of the RT primers prior to full RT reaction assembly for maximum sensitivity. You can now include RNasin® Plus at this step.
- **Protection During Higher Temperature RT Reactions:** Add RNasin® Plus during RT reaction assembly and take the reaction to temperatures above 50°C with enzymes like the ImProm-II™ and AMV Reverse Transcriptases. RNases that may be present will not be reactivated at the higher temperature.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.



Protection from RNase at 70°C. Separate tubes of RNasin® Plus and RNase (lanes 1 and 3) were heated to 70°C for 15 minutes. RNasin® Plus and RNase were combined and then heated to 70°C for 15 minutes (lanes 2 and 4). To each set of reactions, either 100ng (lanes 1 and 2) or 10ng (lanes 3 and 4) of Luciferase Control RNA (Cat.# L4561) were added. The reactions were held at 37°C for 1 hour, then used in an RT-PCR to amplify the entire 1.8kb transcript. The gel shows the amplified product from the RT-PCR. All lanes used 400u of RNasin® Plus and 1.25µg of a rat liver protein extract (abundant source of RNase; Sigma Cat.# L-1380) dissolved in water to 0.5µg/µl.

Recombinant RNasin® Ribonuclease Inhibitor

Product	Size Conc.	Cat.#
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2511
	10,000 u 20–40 u/µl	N2515

For Laboratory Use.

Description: RNases are ubiquitous, cause RNA degradation and can compromise RNA integrity. Recombinant RNasin® Inhibitor is a 50kDa protein that inhibits RNase A family and human placental RNases by noncovalently binding to RNases in a 1:1 ratio. Recombinant RNasin® Inhibitor does not inhibit RNase T1, S1 nuclease, RNase from *Aspergillus*, RNase H, RNase ONE™ Ribonuclease and enzymes for downstream applications such as GoScript™ Reverse Transcriptase, AMV/M-MLV reverse transcriptases, SP6, T7/T3 RNA polymerase, and *Taq* DNA polymerases. Learn more about our custom options for this product at: **www.promega.com/custom/**

Features:

- **Inhibits Common Eukaryotic RNases:** Carries broad-spectrum RNase inhibitory properties.
- **Compatible:** Does not inhibit SP6, T7 or T3 RNA Polymerase; GoScript™, AMV or M-MLV Reverse Transcriptase; or *Taq* DNA polymerase.
- **Broad pH Range (pH 5–8):** Offers flexibility in downstream assays.
- **Recombinantly Produced:** Minimizes chances of human nucleic acid contamination.

Storage Conditions: Store at –20°C.

Native RNasin® Ribonuclease Inhibitor

Product	Size Conc.	Cat.#
RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2111
	10,000 u 20–40 u/µl	N2115
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2511
	10,000 u 20–40 u/µl	N2515

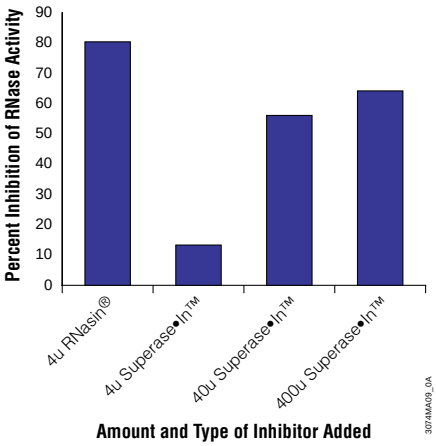
N2111, N2115 For Research Use Only. Not for Use in Diagnostic Procedures. N2511, N2515 For Laboratory Use.

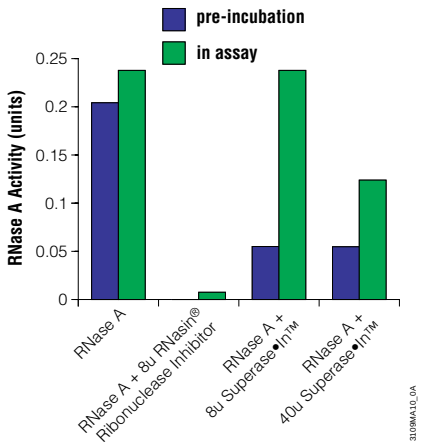
Description: Native RNasin® Inhibitor is a 50kDa protein that inhibits RNase A family and human placental RNases by noncovalently binding to RNases in a 1:1 ratio. Recombinant RNasin® Inhibitor does not inhibit RNase T1, S1 nuclease, RNase from *Aspergillus*, RNase H, RNase ONE™ Ribonuclease and enzymes for downstream applications such as GoScript™ Reverse Transcriptase, AMV/M-MLV reverse transcriptases, SP6, T7/T3 RNA polymerase and Taq DNA polymerases.

Features:

- **Inhibits Common Eukaryotic RNases:** Carries broad-spectrum RNase inhibitory properties.
- **Compatible:** Does not inhibit SP6, T7 or T3 RNA Polymerase; GoScript™, AMV or M-MLV Reverse Transcriptase; or *Taq* DNA polymerase.
- **Broad pH Range (pH 5–8):** Offers flexibility in downstream assays.

Storage Conditions: Store at –20°C.





Comparison of RNasin® Ribonuclease Inhibitor and Superase•In™ inhibition of RNase A activity. Panel A. Total yeast RNA assay. Total yeast RNA was incubated in the presence of 5ng RNase A for 5 minutes at 37°C in 0.5ml of reaction mix containing 50mM MOPS and 5mM $MgCl_2$ (pH 6.5). The indicated amounts of inhibitor (RNasin® or Superase•In™) were mixed with the RNA prior to RNase addition. After incubation, 0.5ml 10% TCA was added to stop the reaction and to precipitate the large RNA molecules. An $O.D._{280}$ measurement was taken of the TCA-soluble material. **Panel B**. "Pre-incubation" and "in assay" conditions. The total yeast RNA assay was performed as described in Panel A along with an experimental modification of "pre-incubation." For the pre-incubation assay, the ribonuclease inhibitors were mixed with RNase and incubated for 15 minutes at 22°C. The pre-incubation mix was then added to the RNA.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Maxwell® 16 System RNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV simplyRNA Cells Kit	48 preps	AS1270
Maxwell® 16 LEV simplyRNA Blood Kit	48 preps	AS1310
Maxwell® 16 LEV simplyRNA Tissue Kit	48 preps	AS1280
Maxwell® 16 Tissue LEV Total RNA Purification Kit	48 preps	AS1220
Maxwell® 16 Cell LEV Total RNA Purification Kit	48 preps	AS1225
Maxwell® 16 Viral Total Nucleic Acid Purification System	48 preps	AS1155
Standard Elution Volume (SEV)		
Maxwell® 16 Total RNA Purification Kit	48 preps	AS1050
Available Separately		
Maxwell® 16 High Strength LEV Magnetic Rod and Plunger Bar Adaptor	1 each	SP1070
LEV Plungers	50 /pk	AS6101
Elution Tubes (LEV)	50 /pk	AS6201
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Plungers (SEV)	50 /pk	AS5201
Elution Tubes (SEV)	50 /pk	AS5101

AS1270, AS1280, AS1220, AS1225, AS1150, AS1050 For Laboratory Use. AS1310, SP1070, AS6101, AS6201, AS1251, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures. AS1155 For In Vitro Diagnostics Use. This product is only available in certain countries.

Description: The Maxwell® 16 LEV simplyRNA Cells Kit and the Maxwell® 16 LEV simplyRNA Tissue Kit are for use with the Maxwell® 16 Instrument configured with the LEV High Strength Magnetic Rod and Plunger Bar Adaptor. This RNA purification procedure is a simple method with minimal lysate handling before automated purification on the Maxwell® 16 Instrument. The low elution volume is used to generate concentrated high-quality RNA suitable for use in downstream applications such as quantitative RT-PCR. The kit provides the reagents for processing the samples and uses prefilled cartridges for purification, maximizing simplicity and convenience.

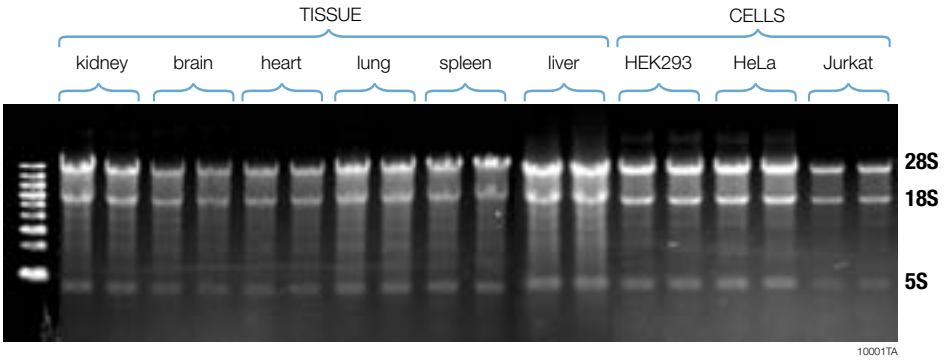
The Maxwell® 16 Total RNA Purification Kit, Maxwell® 16 Tissue LEV Total RNA Purification Kit and Maxwell® 16 Cell LEV Total RNA Purification Kit are designed for use with the Maxwell® 16 Instrument in either the standard or low elution volume (LEV) configuration. The kits provide high-quality, essentially DNA-free total RNA using novel approaches to selectively remove genomic DNA prior to automated RNA purification. You get enhanced sensitivity and improved confidence in your results for quantitative RT-PCR (qRT-PCR), RT-PCR, cDNA synthesis and other applications.

The simple protocols require adding a cleared lysate to the reagent cartridge. Simply place the reagent cartridge into the Maxwell® 16 Instrument, and press start. Purified RNA is obtained in less than 45 minutes of hands-free instrument operation. No post-purification treatment with nuclease, cleanup or concentration is required to achieve superior performance in downstream applications.

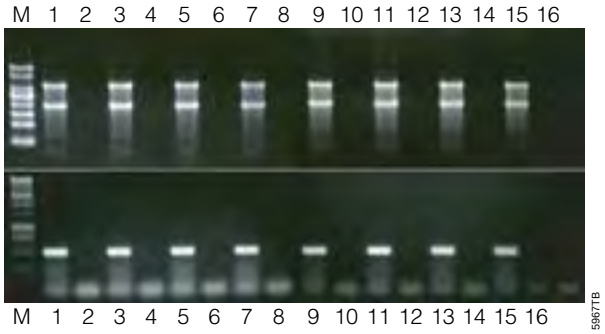
The Maxwell® 16 Total RNA Purification Kits are General Purpose Medical Devices (GPR) in the USA. For up-to-date information visit: **www.promega.com/maxwell16/**

Features:

- **Enjoy Confidence in Your Application Results:** Essentially undetectable contaminating genomic DNA means fewer repeated experiments and unexplained or variable results.
- **Choose Your Sample Type:** Flexibility to purify from tissue, cells, blood and other samples.
- **Achieve High Yield and High Concentration:** High yields and high-concentration total RNA result in better performance in gene expression analysis applications.



Intact RNA extracted from tissue using the Maxwell® 16 LEV simplyRNA Tissue Kit. Extracted tissue samples were run on a FlashGel® System for 5 minutes and signal developed for 15 minutes. The 28S, 18S and 5S are clearly visible indicating intact RNA.



No detectable cross-contamination. Sixteen purification reactions were performed using an input of 25mg of mouse liver lysate (odd lanes) or SV RNA Lysis Buffer alone (even lanes). **Panel A.** Four-microliter aliquots of each purified sample were resolved by 1.2% agarose gel electrophoresis under denaturing conditions. Lane M, RNA Markers (Cat.# G3191). **Panel B.** Equivalent volumes (1µl) of each sample were amplified by endpoint RT-PCR using a primer pair specific for a portion of beta actin RNA. A total of five microliters of each amplification reaction was analyzed by 1.2% agarose gel electrophoresis and visualized by ethidium bromide staining. Lane M, 1kb DNA Ladder (Cat.# G5711).

QuantiFluor® dsDNA System

Product	Size	Cat.#
QuantiFluor® dsDNA System	1 ml	E2670

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® dsDNA System contains a fluorescent DNA-binding dye that enables sensitive quantitation of small amounts of double-stranded DNA (dsDNA) in solution. The quantitation of dsDNA is a very important step in many biological applications, particularly in standard molecular biology techniques. The dye shows minimal binding to single stranded DNA (ssDNA) and RNA, allowing specific quantitation of dsDNA.

Features:

- **Specificity:** Highly specific to dsDNA, minimal binding to ssDNA, RNA, protein and interfering compounds.
- **Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for low-concentration samples. Performs better or equal to PicoGreen® dye and can detect as little as 50pg/ml.
- **Ease of Use:** System includes all required reagents to quickly set up and quantitate dsDNA.
- **Instrument Compatibility:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Detection System.

Storage Conditions: Store at 4°C.

QuantiFluor® ssDNA System

Product	Size	Cat.#
QuantiFluor® ssDNA System	1 ml	E3190

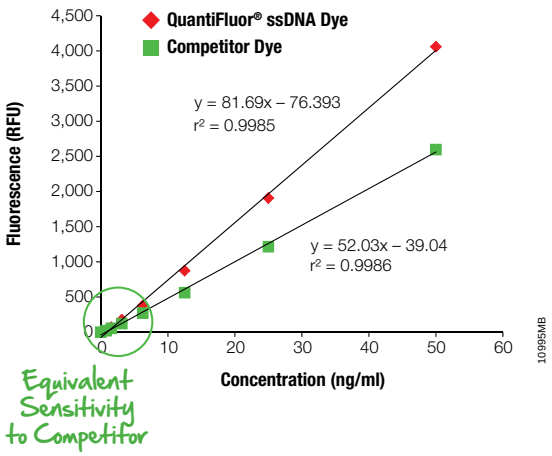
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® ssDNA System contains a fluorescent dye that enables sensitive quantitation of small amounts of single-stranded (ssDNA) in solution. Detecting and quantitating ssDNA is useful for a variety of research interests in molecular biology. These include studying ssDNA viruses, quantitating short synthetic ssDNA probes for site-directed mutagenesis, analysis of first-strand cDNAs and quantitating bisulfite-converted DNA to study DNA methylation.

Features:

- **Increase your Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for those samples that are low in concentration.
- **Save Precious Sample for Downstream Assays:** Less template DNA required than spectrophotometry.
- **Set Up Quickly and Easily:** System includes all the necessary reagents to quickly set up and quantitate ssDNA.
- **Experience Flexible Instrument Compatibility:** Sets up easily on both the QuantiFluor® Fluorometer and GloMax®-Multi+ Detection System. This dye system also can be used on any fluorescent instrument with appropriate optical channels.
- **Remain Cost-Effective:** Value priced for those customers who are cost-conscious and budget-constrained.
- **Instrument Compatibility:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Detection System.

Storage Conditions: Store at –30° to –10°C, protected from light.



The QuantiFluor® ssDNA System will detect ssDNA as little as 1ng/ml (200pg per well) in a 96-well microplate (200ml total volume). Detection limit is defined as greater than three standard deviations above the background RFU.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

QuantiFluor® RNA System

Product	Size	Cat.#
QuantiFluor® RNA System	1 ml	E3310

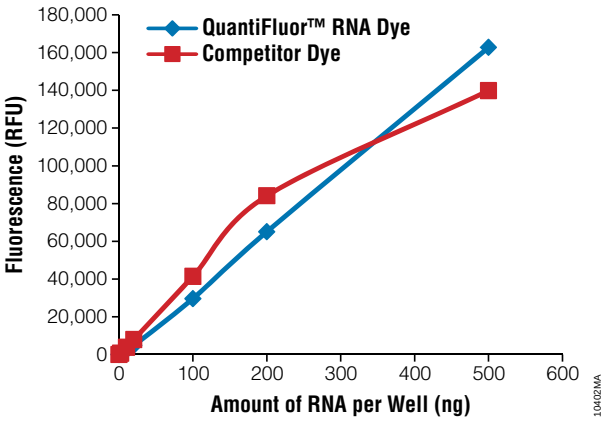
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Sensitive quantitation of RNA is important for the success of downstream applications. The QuantiFluor® RNA System contains a fluorescent RNA-binding dye that enables sensitive quantitation of small amounts of RNA in solution. Detecting and quantitating small amounts of RNA is a very important step that is used in many biological applications, particularly in molecular biology techniques.

Features:

- **Highly Sensitive:** Significantly increased sensitivity over NanoDrop® spectrophotometer, especially for low-concentration samples.
- **Save Precious Sample for Downstream Assays:** Less template RNA required than for quantification by spectrophotometry.
- **Flexible:** Compatible with both QuantiFluor®-ST and GloMax®-Multi Instruments and other fluorometers with appropriate optical channels.
- **Cost-Effective:** Value priced, robust option for RNA quantitation.
- **Instrument Compatibility:** Pre-optimized on both the Quantus™ Fluorometer and GloMax®-Multi+ Detection System.

Storage Conditions: Store at –30°C to –10°C, protected from light.



Standard curves using the QuantiFluor® RNA Dye and a competitor dye. The standard curves were generated using RNA Standard in a 96-well format and 200µl total volume as described in Section 5 of the Technical Manual. The standard curve RNA amounts are 2ng, 10ng, 20ng, 50ng, 100ng, 200ng and 500ng per well. Fluorescence was measured using the GloMax®-Multi+ Detection System. The fluorescence values shown were blank-subtracted. Under these conditions, the dynamic range for the QuantiFluor® RNA Dye is approximately 2–500ng per well (in 200µl total volume), and the QuantiFluor® RNA Dye limit of detection is approximately 100pg per well.

Quantus™ Fluorometer

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Quantus™ Fluorometer is a dual-channel fluorometer for your personal quantitation workflow. Designed to provide highly sensitive fluorescent detection when quantifying nucleic acids, the compact instrument is simple to operate. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA and ssDNA Systems) for nucleic acid quantitation, and allows users the flexibility to create their own methods and quantitation settings for other dyes.

The Quantus™ Fluorometer is equipped with two fluorescence channels for nucleic acid and protein quantitation:

- Blue fluorescence channel: Excitation 495nm shortpass (wavelengths up to 495nm), emission 510–580nm.
- Red fluorescence channel: Excitation 640nm shortpass (wavelengths up to 640nm), emission 660–720nm.

Features:

- **High Performance:** Integrated with QuantiFluor® Dyes for high sensitivity, broad dynamic range and target specificity. Great for low-level sample quantitation such as FFPE or viral samples.
- **Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop® spectrophotometer) for those samples that are low in concentration. Ten times more sensitive than Qubit® 2.0. A detection limit of 50pg/ml, compared to 500pg/ml for the Qubit® 2.0. With a customized low standard curve, the detection limit can read as low as 1pg/ml.
- **Easy-to-Use Workflow and Navigation:** Flexible with custom protocols and user-defined settings. PC software for data management workflow.
- **Affordable Price:** Cost-effective to easily incorporate into your laboratory.

Quantus™ Fluorometer

QuantiFluor® Single-Tube Fluorometers

Product	Size	Cat.#
QuantiFluor®-ST Handheld Fluorometer with UV/Blue Channels	1 each	E6090
QuantiFluor®-P Handheld Fluorometer with Green/Blue Channels	1 each	E6100
QuantiFluor®-P Handheld Fluorometer with UV/Blue Channels	1 each	E6105
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 245.

QuantiFluor®-ST and QuantiFluor®-P Single-Tube Fluorometers.

Available in the Helix® on-site stocking system

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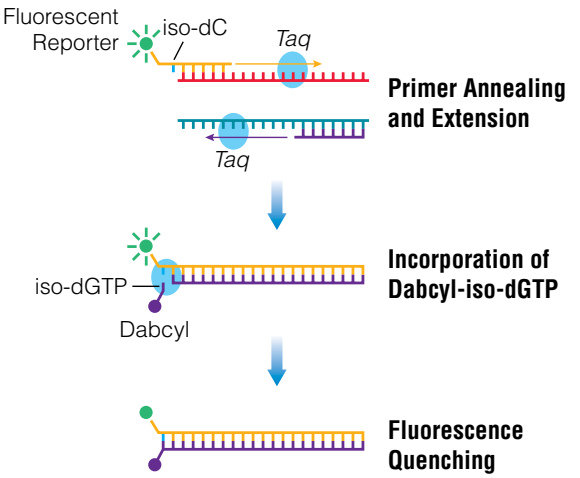
Plexor® HY System

Product	Size	Cat.#
Plexor® HY System	200 reactions	DC1001
	800 reactions	DC1000
Not For Medical Diagnostic Use.		

For additional information see page 8.



Schematic diagram illustrating the Plexor® real-time PCR process.

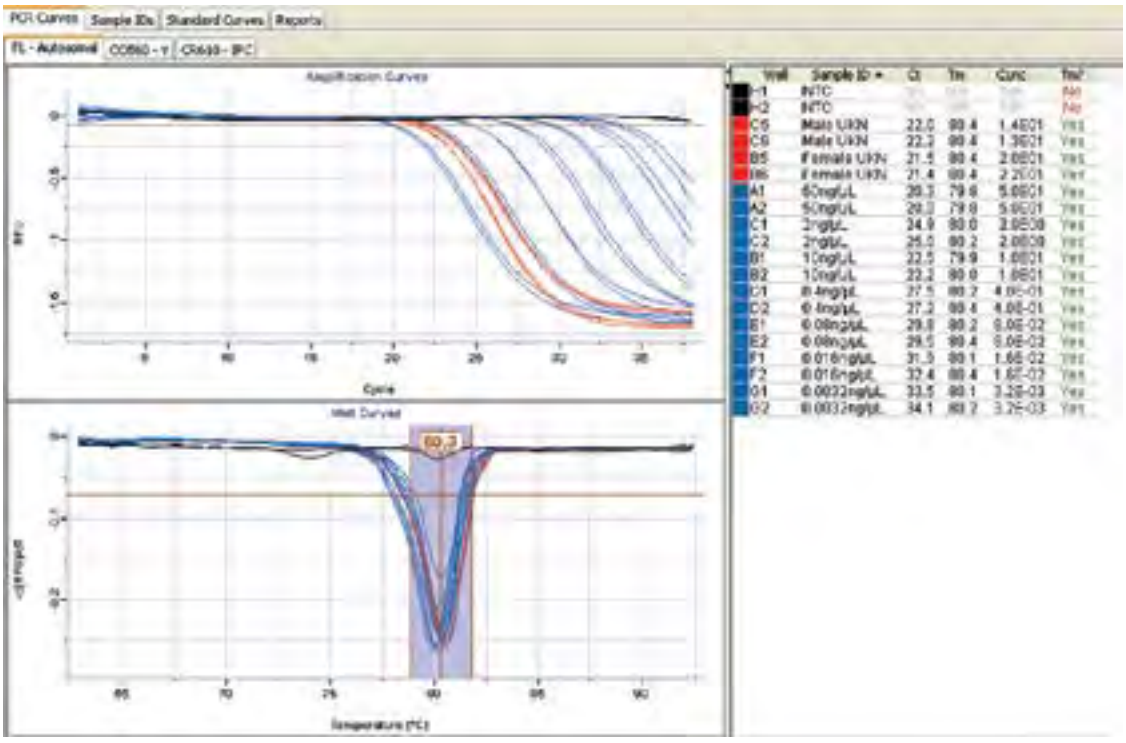
Nucleic Acid Purification Accessories

Plates

Product	Size	Cat.#
Wizard® SV 96 Binding Plates	10 pack	A2271
	100 pack	A2278
Wizard® SV 96 Lysate Clearing Plates	10 pack	A2241
	100 pack	A2248
384-Well Plate, Flat	10 /pk	V5291
384-Well Plate, Conical	10 /pk	V5311
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Binding Plates, Lysate Clearing Plates and 384-Well Plates (Flat and Conical) are available for nucleic acid purification. The Wizard® SV 96 Binding Plates are used with the Wizard® SV 96 Plasmid DNA Purification System (Cat.# A2250, A2255), Wizard® SV 96 Genomic DNA Purification System (Cat.# A2370, A2371) and Wizard® SV 96 PCR Clean-Up System (Cat.# A9340, A9341, A9342) to isolate DNA, or with the SV 96 Total RNA Isolation System (Cat.# Z3500, Z3505) to isolate RNA. The isolation procedures can be performed manually or on a robotic platform. The Binding Plates are designed for use with the Vac-Man® 96 Vacuum Manifold (Cat.# A2291) or a comparable manifold.

The Wizard® SV 96 Lysate Clearing Plates are used with the Wizard® SV 96 Binding Plates (Cat.# A2271, A2278) and the Vac-Man® 96 Vacuum Manifold (Cat.# A2291) for simultaneous lysate clearing and DNA binding in the Wizard® SV 96 (Cat.# A2250, A2255) and Wizard® SV 9600 (Cat.# A2258) Plasmid DNA Purification System protocols.



Autosomal amplification curves and melt curves from a Plexor® HY amplification.

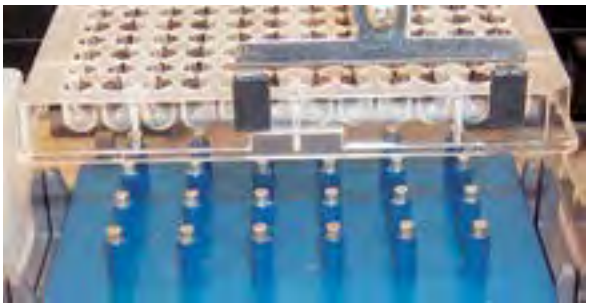
Magnetic Stands and Spacers

Product	Size	Cat.#
MagnaBot® 96 Magnetic Separation Device	1 each	V8151
MagnaBot® II Magnetic Separation Device	1 each	V8351
MagnaBot® Flat Top Magnetic Separation Device	1 each	V6041
Plate Clamp 96	1 each	V8251
Plate Stand	1 each	V8261
Deep Well MagnaBot® 96 Magnetic Separation Device	1 each	V3031
Heat Transfer Block	1 each	Z3271
Heat Block Insert	1 each	Z3651
MagnaBot® Spacer 3/16 inch	1 each	V8381
MagnaBot® Spacer 1/8 inch	1 each	V8581
MagnaBot® Spacer 1/16 inch	1 each	V8681
1/4 inch Foam Spacer	1 each	Z3301
MagnaBot® 384 Magnetic Separation Device	1 each	V8241
384-Well Plate, Flat	10 /pk	V5291
384-Well Plate, Conical	10 /pk	V5311

V8151, V8351, V6041, V8251, V8261, Z3271, V5291, V5311 For Research Use Only. Not for Use in Diagnostic Procedures. V3031, Z3651, V8241 For Laboratory Use.

3993TA02_3A

MagnaBot® 96 Magnetic Separation Device (Cat.# V8151).


2889TA03_0A

MagnaBot® 96 Magnetic Separation Device (Cat.# V8151) with a 96-well Collection Plate and robotic gripper arm.


3417TA05_1A

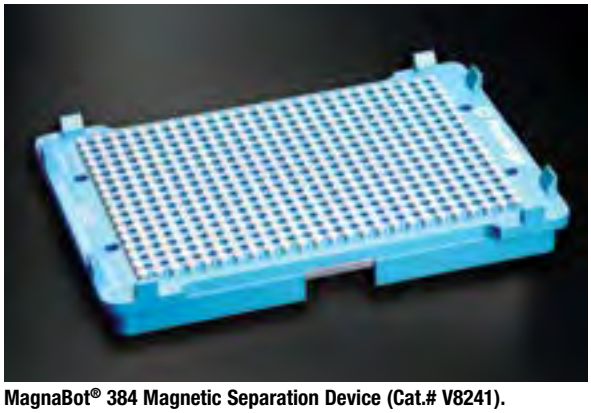
MagnaBot® II Magnetic Separation Device (Cat.# V8351).


3375TA05_1A

Plate Clamp 96 (Cat.# V8251) with a 96-well PCR plate.


3373TA05_1A

Plate Stand (Cat.# V8261).


3995TA02_3A

MagnaBot® 384 Magnetic Separation Device (Cat.# V8241).

Available in the Helix® on-site stocking system

Section Contents
Table of Contents

Magnetic Stands and Spacers (continued)

Product	Size	Cat.#
MagneSphere® Technology Magnetic Separation Stand (two-position)	0.5 ml	Z5331
	1.5 ml	Z5332
	12 × 75 mm	Z5333
MagneSphere® Technology Magnetic Separation Stand (twelve-position)	0.5 ml	Z5341
	1.5 ml	Z5342
	12 × 75 mm	Z5343
PolyATtract® System 1000 Magnetic Separation Stand	1 each	Z5410

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2312TA07_8A

MagneSphere® Technology Magnetic Separation Stand (two-position) (Cat.# Z5331, Z5332, Z5333).

2309TA07_8A

MagneSphere® Technology Magnetic Separation Stand (twelve-position) (Cat.# Z5341, Z5342, Z5343).

2311TA07_8A

PolyATtract® System 1000 Magnetic Separation Stand (Cat.# Z5410).

MagneSphere® Magnetic Separation Stands Compatible with the PolyATtract® Systems.

Stand Cat.#	Sample Size	Compatible Product
2-Position Stand		
Z5331	5–10mg	PolyATtract® System 1000
Z5332	5–35mg	PolyATtract® System 1000 PolyATtract® System III or IV
	1×10^6 cells	PolyATtract® System 1000
Z5333	35–100mg	PolyATtract® System 1000 PolyATtract® System I or II
Z5410	0.1–1g or 10^7–10^8 cells	PolyATtract® System 1000
12-Position Stand		
Z5341	5–10mg	PolyATtract® System 1000
Z5342	5–35mg or 1×10^6 cells	PolyATtract® System 1000 PolyATtract® System III or IV
Z5343	35–100mg	PolyATtract® System 1000

9488LA

Vacuum Manifolds and Accessories

Product	Size	Cat.#
Vac-Man® 96 Vacuum Manifold	1 each	A2291
Vac-Man® Jr. Laboratory Vacuum Manifold, 2-sample capacity	1 each	A7660
Vac-Man® Laboratory Vacuum Manifold, 20-sample capacity	1 each	A7231
Available Separately		
Collar for Vac-Man® 96 Vacuum Manifold	1 each	A2311
One-Way Luer-Lok® Stopcocks	10 each	A7261
Vacuum Adapters	20 each	A1331

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0173CB

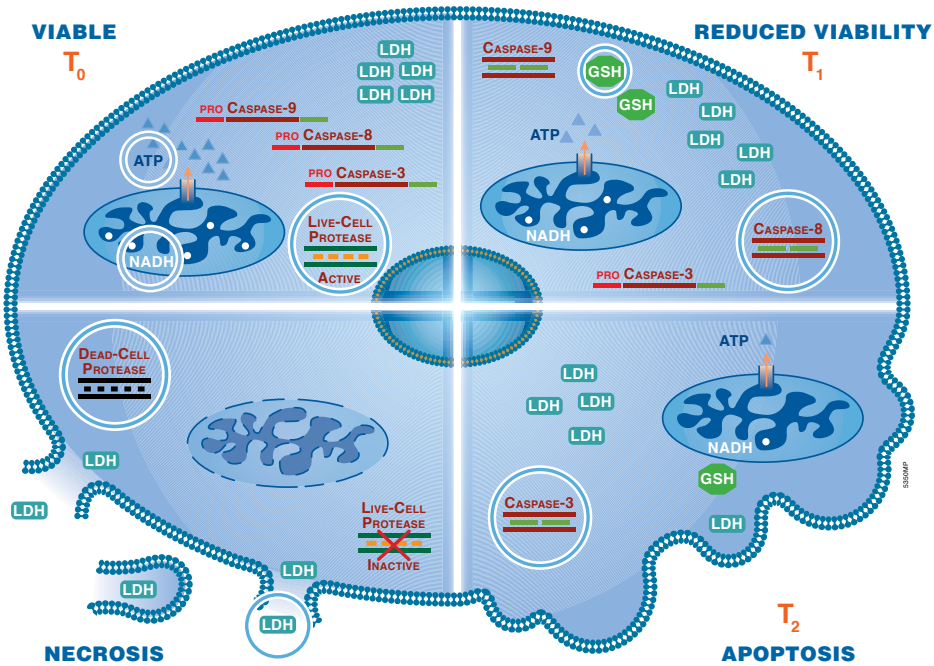
8 Drug Discovery

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Drug Discovery Solutions

Harnessing the Power of Bioluminescence for Biochemical and Cell-Based Assays



Today's drug development needs are mature and complex. Instead of targets, biology and workflow are key elements. Drug developers in academia and industry alike need assays that are sensitive, robust, scalable and easy to use, that fit their workflows while maintaining physiological relevance.

Promega has developed key platform technologies based on luminescence and fluorescence that can be applied across the discovery spectrum.

Promega continues to offer solutions that enable you to develop better drugs, faster:

- Better profiling data
- More biologically relevant data
- Multiplexing solutions for increased understanding of biology
- Custom Assay Services (CAS@promega.com)

Starting with a single, well-defined biological reaction, we have developed a solid technology platform from which hundreds of unique in vitro biochemical and cell-based assays have been configured.

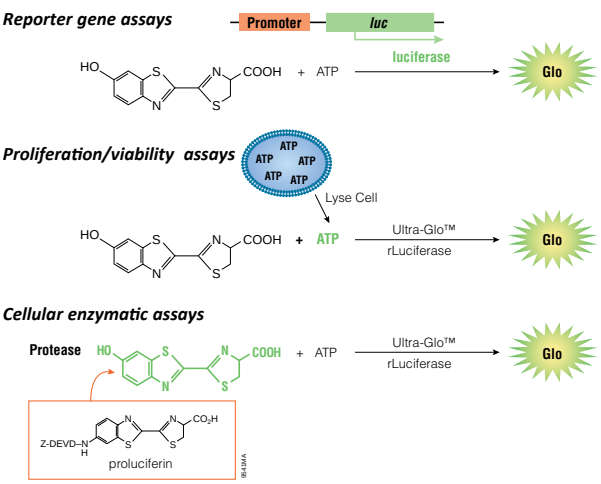
On the following pages are multiple robust and functionally tested assays for many early drug discovery needs. And if what you are looking for isn't here, let us partner with you to develop a custom solution.

Custom Assay Services

Biology-driven, Promega technology-enabled custom solutions for:

- Cell Engineering
- Assay Development & Qualification
- Assay-Ready Cells In-Scale
- Custom Assay Materials

www.promega.com/CAS/



cAMP-Glo™ Assay

Product	Size	Cat.#
cAMP-Glo™ Assay	300 assays	V1501
	3,000 assays	V1502
	30,000 assays	V1503

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The cAMP-Glo™ Assay is a homogeneous, bioluminescent and high-throughput assay for measuring cAMP levels in cells. The cAMP-Glo™ Assay monitors cAMP production in cells in response to the effects of test compounds on G protein-coupled receptors (GPCR). GPCRs that couple with adenylate cyclase will increase or decrease intracellular cAMP. The assay is based on the principle that cyclic AMP (cAMP) stimulates protein kinase A (PKA) holoenzyme activity, decreasing available ATP and leading to decreased light production in a coupled luciferase reaction.

The cAMP-Glo™ Assay can be performed in 96-, 384- or 1536-well plates. The cells are induced with a test compound for an appropriate period of time to modulate cAMP levels. After induction, cells are lysed to release cAMP, then the cAMP detection solution, which contains protein kinase A, is added. The Kinase-Glo® Reagent is then added to terminate the PKA reaction and detect the remaining ATP via a luciferase reaction. Plates are read using a microplate-reading luminometer. Luminescence can be correlated to the cAMP concentrations by using a cAMP standard curve. The half-life for the luminescent signal is greater than 4 hours. This extended signal half-life eliminates the need for luminometers with reagent injectors and allows batch-mode processing of multiple plates.

Features:

Fast and Easy to Use:

- Assay can be completed in approximately 45 minutes.
- Homogeneous.
- Just two steps following cell lysis.

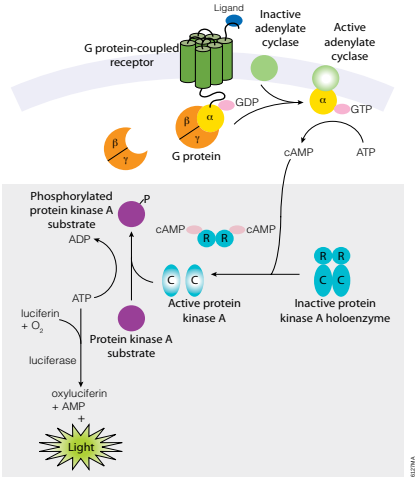
Excellent Signal-to-Noise Ratios:

- Best signal:background ratio of all the cAMP assays.
- Signal:Background >200 (with cAMP), >15 (on cells).
- Easily scalable to 1536-well plate formats and beyond.

Proven Luminescent Technology:

- Powered by Ultra-Glo™ Recombinant Luciferase.
- No interference by fluorescent compounds.
- Non-radioactive.

Storage Conditions: Store the system at –20°C. Once prepared, the cAMP detection solution (cAMP-Glo™ Reaction Buffer with Protein Kinase A) should not be frozen. Once prepared, the Kinase-Glo® Reagent should be dispensed into aliquots and stored at –20°C. See the product label for the expiration date.



Schematic of cAMP production in cells and the cAMP-Glo™ Assay.

cAMP-Glo™ Max Assay

Product	Size	Cat.#
cAMP-Glo™ Max Assay	2 plates	V1681
	20 plates	V1682
	10 × 20 plates	V1683

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The cAMP-Glo™ Max Assay is a homogeneous, bioluminescent, high-throughput assay to measure cyclic AMP (cAMP) levels in cells. Compounds that modulate GPCRs coupled with adenylate cyclase typically alter intracellular cAMP levels. The cAMP-Glo™ Max Assay monitors cAMP levels in cells in response to the effect of agonists, antagonists or test compounds on G protein-coupled receptors (GPCRs). The assay is based on the principle that cyclic AMP (cAMP) stimulates protein kinase A (PKA) holoenzyme activity, decreasing available ATP and leading to decreased light production in a coupled luciferase reaction.

This improved version combines the lysis and cAMP reaction buffers into the cAMP-Glo™ ONE Buffer. This new format streamlines the protocol and reduces the time needed to complete the assay. The new ONE Buffer is supplied at a 5X concentration, which provides increased flexibility for starting cell culture volumes.

The cAMP-Glo™ Max Assay can be performed in 96-, 384- or 1536-well plates. The cells are induced with a test compound for an appropriate period of time to modulate cAMP levels. After induction, cells are lysed and the cAMP released stimulates protein kinase A in the reagent (Figure 1). The Kinase-Glo® Reagent is then added to terminate the PKA reaction and detect the remaining ATP via a luciferase reaction. Plates are read using a microplate-reading luminometer. The half-life for the luminescent signal is greater than 4 hours allowing ample time to read the plates and eliminates the need for luminometers with reagent injectors.

Features:

Fast and Easy to Use:

- Improved—Lysis and cAMP detection steps combined (cAMP-Glo™ ONE Buffer).
- ONE Buffer—5X concentration provides better flexibility for starting cell culture volumes.
- Assay can be completed in approximately 30 minutes.

Excellent Signal-to-Noise Ratios:

- Best signal:background ratio of all the cAMP assays.
- Signal:Background >200 (with cAMP), >15 (on cells).
- Easily scalable to 1536-well plate formats and beyond.

Proven Luminescent Technology:

- Powered by Ultra-Glo™ Recombinant Luciferase.
- No interference by fluorescent compounds.
- Non-radioactive.

Storage Conditions: Store the system at –20°C. Before use, completely thaw components at room temperature, except for the Protein Kinase A, which should be kept on ice when not at –20°C. After thawing, mix all components thoroughly before use. Once prepared, the cAMP detection solution (cAMP-Glo™ ONE Buffer with Protein Kinase A) should not be frozen. Once prepared, the Kinase-Glo® Reagent should be dispensed into aliquots and stored at –20°C. See the product label for the expiration date.

GloSensor™ cAMP Assay

Product	Size	Cat.#
GloSensor™ cAMP HEK293 Cell Line	2 vials	E1261
pGloSensor™-22F cAMP Plasmid	20 µg	E2301
pGloSensor™-20F cAMP Plasmid	20 µg	E1171
GloSensor™ cAMP Reagent	25 mg	E1290
	250 mg	E1291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloSensor™ cAMP Assay presents a novel approach to measuring cAMP levels in live cells. cAMP is a key second messenger involved in signal transduction of GPCRs acting through $G\alpha_s$ and $G\alpha_i$ proteins. The new assay is based on the GloSensor™ Technology, a genetically modified form of firefly luciferase into which a cAMP-binding protein moiety has been inserted. Upon binding of cAMP, conformational change is induced leading to increased light output. This live-cell assay excels at kinetic and modulation studies of signaling through cAMP.

Researchers can use the GloSensor™ cAMP Assay by transiently expressing a receptor of interest and the biosensor in the cell line of choice. Alternatively, stably transfected cell lines with both the biosensor and the receptor of interest can be made. The protocol is simple: Cells are pre-equilibrated with GloSensor™ cAMP Reagent for approximately 2 hours; then cells are treated with specific agonists/antagonists or compounds, and luminescence is measured after 10–30 minutes. No other reagent additions or manipulations are required. Most common luminometers with injectors can be used to read the assay. GloSensor™ cAMP Reagent is required for use with this assay per the GloSensor™ Limited Use Label License.

Choosing the Appropriate Plasmid

We offer two variants of the biosensor, and we recommend the pGloSensor™-22F cAMP Plasmid as the first choice for most applications.

pGloSensor™-22F cAMP Plasmid. Following cell-free expression in vitro, the version encoded by this construct shows an increased EC_{50} for activation together with increased signal-to-background ratio at cAMP saturation relative to the version encoded by the pGloSensor™-20F cAMP construct. In general, we have observed similar relationships between the two constructs when their performance is compared in living cells.

pGloSensor™-20F cAMP Plasmid. The version encoded by this construct performs well in HEK293 cells at 37°C. Luminescence from the pGloSensor™-22F cAMP Plasmid construct can be more difficult to detect at physiologic temperatures.

For a more thorough explanation of the general performance differences between the two plasmids, please consult Section 3.B, Recommendations on Choice of GloSensor™ Plasmid, in the *GloSensor™ cAMP Assay Technical Manual*, #TM076.

Features:

- **Best-in-Class Performance:** High Z′ and large signal:background ratio values. Ideally suited to HTS/uHTS. Up to 1,000-fold changes in light output obtained.
- **Live-Cell, Non-Lytic Assay Format:** "Zero-step assay" greatly facilitates HTS/uHTS. Easy monitoring of cAMP in live cells enables a more complete analysis of receptor biology.
- **High Sensitivity and Increased Biological Relevance:** Easy detection of low-abundance, endogenous receptors; direct detection of G_i-coupled receptor activation and inverse agonist activity in the absence of added forskolin. PDE inhibitors not needed.

Storage Conditions: Store the pGloSensor™ cAMP Plasmid at –20°C and the GloSensor™ cAMP Reagent at –70°C. Store the resuspended GloSensor™ cAMP Reagent at –70°C in single-use aliquots.

PDE-Glo™ Phosphodiesterase Assay

Product	Size	Cat.#
PDE-Glo™ Phosphodiesterase Assay	1,000 assays	V1361
	10,000 assays	V1362

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PDE-Glo™ Phosphodiesterase Assay is a luminescent, high-throughput screening (HTS) method for measuring cyclic nucleotide phosphodiesterase activity from **purified** sources. Cyclic nucleotide phosphodiesterases (PDEs) are involved in a myriad of cellular processes due to their ability to hydrolyze, and thus control, the levels of the second-messenger signaling molecules cAMP and cGMP.

The availability of selective inhibitors for PDEs has facilitated their use as tools to study cyclic nucleotide signaling and paved the way to investigate the role of PDEs in cellular and tissue pathologies. The PDE-Glo™ Phosphodiesterase Assay allows lead candidates to be identified from compound libraries. The assay is designed for 384-well plates, but assay volumes can easily be scaled for 96- or 1536-well plates. The PDE-Glo™ Phosphodiesterase Assay is optimized to work with both cAMP- and cGMP-dependent phosphodiesterases. The total time required for the assay from start to finish is less than 1 hour after the PDE reaction is complete.

Features:

Versatile:

- Works with **both** cAMP and cGMP PDEs.

Sensitive:

- Excellent signal:background ratios.
- Scalable to 1536-well plate formats.

Fast and Easy to Use:

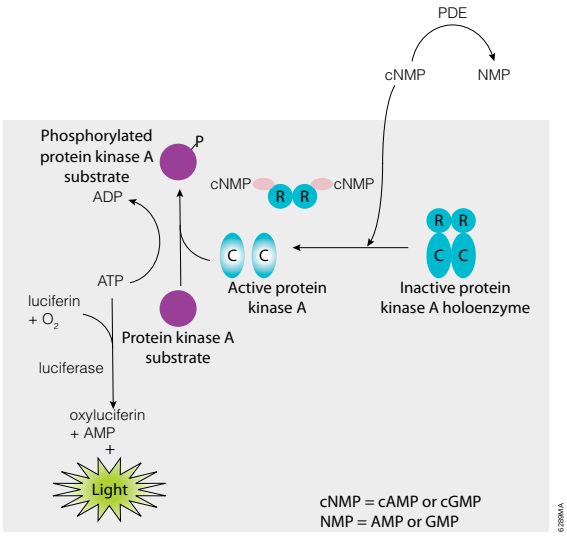
- Assay can be completed in <1 hour.
- Homogeneous.

Proven Luminescent Technology:

- Powered by Ultra-Glo™ Luciferase.
- Non-radioactive.

No Interference by Fluorescent Compounds.

Storage Conditions: Store the system at –20°C. See the product label for the expiration date.



The PDE-Glo™ Phosphodiesterase Assay.

GloResponse™ Luciferase Reporter Cell Lines

Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line	2 vials	E8530

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloResponse™ Luciferase Reporter Cell Lines contain optimized, state-of-the-art luciferase reporter technology integrated into a cell line. This allows the rapid development of a reporter assay based on the pathway of interest regulating the luciferase gene. Assays configured using the GloResponse™ Cell Lines are amenable for high-throughput screening. These assays typically have greater response dynamics (fold of induction) than other assay formats and good quality as indicated by the high Z′ values. GloResponse™ Cell Lines were developed to study a variety of signaling pathways. Activators of these pathways may be native to the HEK293 cell line. Activity of non-native activators can be studied after they have been introduced by transfection.

GPCRs regulate a wide-range of biological functions and are one of the most important target classes for drug discovery. GPCR signaling pathways can be categorized into three classes based on the G protein α-subunit involved: G_s, $G_{i/o}$ and G_q. The GloResponse™ CRE-*luc2P* HEK293 Cell Line can be used to study and configure screening assays for G_s- and $G_{i/o}$-coupled GPCRs, which signal through cAMP and the cAMP Response Element (CRE). For G_q-coupled GPCRs, which signal through calcium ion release and activate the Nuclear Factor of Activated T-Cells response element (NFAT-RE), the GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line should be used.

NF-κB-REs are the DNA binding sequences for the NF-κB transcription factor complex, which is responsible for regulating inflammation, immune response, cell growth and apoptosis. The GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line is designed for rapid and convenient analysis of any cellular response that results in modulation of NF-κB activities.

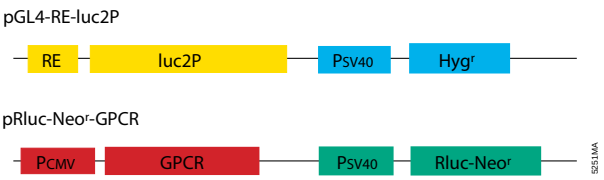
The GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line contains nine repeats of GAL4 UAS (Upstream Activator Sequence) driving the transcription of the luciferase reporter gene *luc2P* in response to binding of a fusion protein containing the GAL4 DNA Binding Domain, such as the Estrogen Receptor Ligand Binding Domain in pBIND-ERα Vector (Cat.# E1390) when activated by a ligand. This makes the cell line suitable for the study of nuclear receptors or can be used to study other types of protein:protein and protein:DNA interactions. The GAL4 DNA Binding Domain partner must be introduced to this cell line by transfection or other similar techniques.

The GloResponse™ Cell Lines were generated by clonal selection of HEK293 cells stably transfected with pGL4-based vectors carrying specific response elements for the pathway of interest. These cell lines incorporate the improvements developed for the pGL4 family of reporter vectors for enhanced performance. The destabilized *luc2P* luciferase reporter is used for improved responsiveness to transcriptional dynamics. The *luc2P* gene is codon optimized for enhanced expression in mammalian cells, and the pGL4 plasmid backbone was engineered to reduce background reporter expression. The result is a cell line with very high induction levels when the pathway of interest is activated.

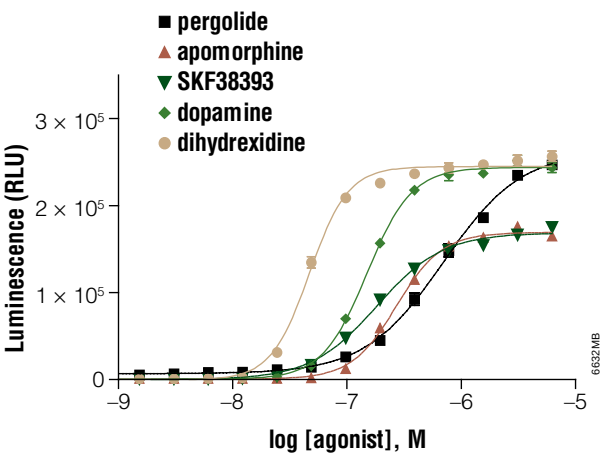
Features:

- **Convenient:** Prebuilt, optimized luciferase reporter cell lines.
- **Robust:** Large assay window provided by high levels of induction and low background expression.
- **Faster Results:** Improved responsiveness to transcriptional dynamics with destabilized luciferase.

Storage Conditions: Place frozen cells in storage at less than or equal to –140°C (mechanical deep freeze or vapor phase liquid nitrogen) until you are ready to thaw and propagate them. We strongly recommend that the cells are propagated, using the provided procedure, as soon as possible. This will ensure the optimal cell viability and assay performance.



Two plasmids involved in the dual-luciferase GPCR assay. RE, response element/promoter; *luc2P*, destabilized firefly luciferase with PEST sequence; P_{SV40}, SV40 promoter; Hyg^r, hygromycin resistance gene; P_{CMV}, CMV promoter; *Rluc*-neo^r, *Renilla* luciferase and neomycin resistance gene fusion. PEST sequences are associated with rapidly degraded proteins.



Ranking compound potency and detection of DRD1 partial agonists. A GloResponse™ CRE-*luc2P* clone stably expressing dopamine receptor D1 was plated at 10,000 cells/well in a 96-well plate. Each agonist was serially diluted 1:2, then added to wells in replicates of four, beginning with 50µM. Cells were incubated with agonist for four hours, harvested and analyzed using the Dual-Glo™ Luciferase Assay System (Cat.# E2920). Luciferase activity was measured on the GloMax® 96 Microplate Luminometer (Cat.# E6501).

Protease Assays

Protease-Glo™ Assay

Product	Size	Cat.#
Protease-Glo™ Assay	1 each	G9451
Available Separately	**Size**	**Cat.#**
pGloSensor™-10F Linear Vector	1 µg	G9461

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Protease-Glo™ Assay is a novel method to detect and measure protease activities using a genetically engineered firefly (*Photinus pyralis*) luciferase and represents one example of the GloSensor™ platform technology. The assay uses a circularly permuted firefly luciferase, the GloSensor™-10F protein, with a protease recognition site as the protease substrate. This assay system allows rapid generation of protease substrates through molecular cloning and coupled transcription/translation cell-free expression, thus enabling the facile evaluation of protease function. Oligonucleotides encoding a protease recognition sequence are designed and cloned into the GloSensor™-10F gene located on a linearized vector. The GloSensor™ protein containing the protease site of interest is then synthesized in a cell-free protein expression system and subsequently used as a protease substrate. Cleavage of the protease recognition sequence leads to activation of the GloSensor™ protein and light emission. The level of luminescence correlates to protease activity. The Protease-Glo™ Assay has the advantage of a bioluminescent readout, which provides easy quantitation, high sensitivity and wide dynamic range.

Visit the Protease-Glo™ Assay Design Tool to see how to generate your protease recognition site of interest in the pGloSensor™-10F Linear Vector and express the protein using cell-free translation.

Features:

- **Flexible:** Use with P′ requiring proteases.
- **Avoid Fluorescent Background Problems:** Physical and chemical features of luminescence overcome problems due to fluorescence interference.
- **Greater Sensitivity:** Ease and dynamic range of luminescence.
- **Open Platform System:** Create your own recognition substrates.
- **Interrogate Sequences:** Excellent tool to determine optimal protease recognition sequences or effects of amino acid substitutions.
- **Web Application:** Makes proper oligo design fast and easy; simply enter your amino acid sequence of interest.

See the Protease-Glo™ Assay Design Tool.

Storage Conditions: Store all components at –20°C, except the TnT® SP6 High-Yield Wheat Germ Master Mix, which must be stored at –70°C.

Luminometer Plates

Product	Size	Cat.#
Luminometer Plates	50 plates	Z3291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These plates are White 96-Well Cliniplate, Universal Binding, Flat Bottom, and are multiwell plates recommended for use with the Protease-Glo™ Assay. The plates offer excellent optical, binding precision and are compatible with all common instruments (manufactured by Thermo Fisher Scientific).

Features:

- **Compatible with All Common Instruments:** Excellent optical and binding properties.

Storage Conditions: Store at room temperature in a cool and dry location.

DUB-Glo™ Protease Assay

Product	Size	Cat.#
DUB-Glo™ Protease Assay (DUB/SENP/NEDP)	10 ml	G6260
	50 ml	G6261

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DUB-Glo™ Protease Assay (DUB/SENP/NEDP) is a homogeneous, bioluminescent assay that measures the activity of numerous deconjugating enzymes including deubiquitinating (DUB), deSUMOylating (SENP) and deneddylating (NEDP) proteases. These proteases reverse the protein modification by ubiquitin and ubiquitin-like proteins (Ubl proteins) and thus are integral components in the complex mechanisms of posttranslational protein regulation in eukaryotes.

Features:

- **Greater Sensitivity:** The luminescent format provides enough sensitivity to enable use of a simple peptide-based substrate, Z-RLRGG-aminoluciferin, for assaying deconjugating proteases. Fluorescence generally requires the use of full-length substrates.
- **Broad Dynamic Range:** The assays are linear over 2–3 logs of deconjugating protease concentrations.
- **Signal Stability:** The coupled-enzyme format results in very stable signal with a half-life >3 hours. Substrate depletion is not a concern as it is when using the full-length substrates, Ub-AMC, SUMO-AMC or Nedd8-AMC.
- **Fast:** Maximum sensitivity is reached in 10–30 minutes after reagent addition because the signal is not dependent on accumulation of cleaved product for sensitivity in the coupled-enzyme format.
- **Accurate and Robust:** The broad linear range and excellent sensitivity readily translate to accurate kinetic analysis of inhibitors. Assays can be scaled to 384-well with suitable Z′ factors.
- **Greater Flexibility:** The K_m values for the peptide substrates are much higher than they are for full-length substrates, yet the sensitivity of the luminescent assay allows the assay to be run significantly below K_m while still achieving good signal-to-background ratios for extended time periods. A single luminescent substrate concentration can be used for a wide variety of DUB/SENP/NEDP proteases without worrying about substrate depletion or substrate inhibition.
- **Batch-Processing Capability:** The homogeneous coupled-enzyme format results in a continuous signal, providing excellent stability and allowing plates to be read over an extended period of time.

Storage Conditions: Store components at –20°C protected from light.

DPPIV-Glo™ Protease Assay

Product	Size	Cat.#
DPPIV-Glo™ Protease Assay	10 ml	G8350
	50 ml	G8351

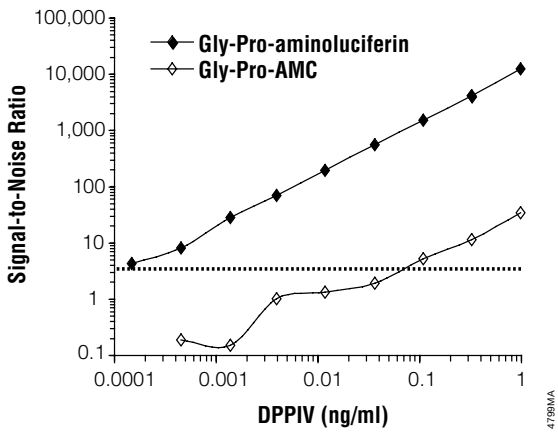
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DPPIV-Glo™ Protease Assay is a homogeneous, luminescent assay that measures dipeptidyl peptidase IV (DPPIV) activity. DPPIV is a serine protease that cleaves N-terminal dipeptides from polypeptides with L-proline or L-alanine at the penultimate position. The DPPIV-Glo™ Assay provides a proluminescent DPPIV substrate, Gly-Pro-aminoluciferin, in a buffer system optimized for DPPIV and luciferase activities. The addition of a single DPPIV-Glo™ Reagent in an "add-mix-measure" format results in DPPIV cleavage of the substrate and generation of a "glow-type" luminescent signal produced by the luciferase reaction. In this homogeneous, coupled-enzyme format, the signal is proportional to the amount of DPPIV activity present. The assay is designed for use with purified enzyme preparations.

Features:

- **Simplified Method:** The homogeneous "add-mix-measure" protocol makes the assay highly amenable to automation.
- **Greater Sensitivity:** The assay is more sensitive than fluorescent-based DPPIV assays. In contrast to fluorescent assays, the luminescent assay avoids inherent fluorescent background signals and thus provides excellent signal-to-background readings. The assay is linear over more than 3 logs of DPPIV concentration and can detect less than 1pg/ml enzyme.
- **Faster Results:** The maximum signal (and maximum sensitivity) of the assay is reached in as little as 30 minutes after reagent addition and, unlike fluorescent assays, is not dependent on accumulation of cleaved product.
- **Amenable to Batch Processing:** The stability of the signal allows plates to be read over an extended period of time.

Storage Conditions: Store components at –20°C protected from light.



Sensitivity of the DPPIV-Glo™ Protease Assay compared to a fluorescent assay.

Proteasome-Glo™ Assays

Product	Size	Cat.#
Proteasome-Glo™ Chymotrypsin-Like Assay	10 ml	G8621
	50 ml	G8622
Proteasome-Glo™ Trypsin-Like Assay	10 ml	G8631
	50 ml	G8632
Proteasome-Glo™ Caspase-Like Assay	10 ml	G8641
	50 ml	G8642
Proteasome-Glo™ 3-Substrate System	10 ml	G8531
	50 ml	G8532

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **Proteasome-Glo™ Assays** are homogeneous, luminescent assays that individually measure the chymotrypsin-like, trypsin-like and caspase-like protease activities associated with the proteasome in a purified enzyme-based format. The 26S proteasome is a 2.5MDa multiprotein complex found in all eukaryotic cells. Adding the Proteasome-Glo™ Cell-Based Reagent in an "add-mix-measure" format results in proteasome cleavage of the substrate and rapid generation of a luminescent signal produced by the luciferase reaction.

The three luminogenic substrates used to monitor specific protease activities include: Suc-LLVY-aminoluciferin for chymotrypsin-like, Z-LRR-aminoluciferin for trypsin-like, and Z-nLPnLD-aminoluciferin for caspase-like activity. Each luminogenic substrate is added to a buffer system optimized for its specific proteasome activity and luciferase activity. The reagents are added to test samples containing proteasome enzyme that cleaves the substrates, releasing luciferin, which is consumed by luciferase, producing "glow-type" luminescence correlating to enzyme activity or inhibition.

The **Proteasome-Glo™ 3-Substrate System** consists of three homogeneous bioluminescent assays in an enzyme-based format (each of these three assays also is available separately).

The **Proteasome-Glo™ Cell-Based 3-Substrate System** consists of three homogeneous bioluminescent assays that measure the three proteolytic activities associated with the proteasome in a cell-based format (each of these three assays also is available separately).

Features:

- **Simplified Method:** The "add-mix-measure" protocol minimizes handling steps and makes the assays amenable to automation.
- **Faster Results:** Maximum sensitivity is reached 10–30 minutes after reagent addition.
- **Greater Sensitivity:** The luminescent assay format avoids inherent fluorescent background signals, providing excellent signal-to-background readings. The assays are miniaturizable to 384-well format.

Storage Conditions: Store the Proteasome-Glo™ Assay components at –20°C.

Available in the Helix® on-site stocking system

Section Contents
Table of Contents

Cell-Based Proteasome-Glo™ Assays

Product	Size	Cat.#
Proteasome-Glo™ Chymotrypsin-Like Cell-Based Assay	10 ml	G8660
	5 × 10 ml	G8661
	2 × 50 ml	G8662
Proteasome-Glo™ Trypsin-Like Cell-Based Assay	10 ml	G8760
	5 × 10 ml	G8761
Proteasome-Glo™ Caspase-Like Cell-Based Assay	10 ml	G8860
	5 × 10 ml	G8861
Proteasome-Glo™ 3-Substrate Cell-Based Assay System	10 ml	G1180
	50 ml	G1200

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **Proteasome-Glo™ Cell-Based Assays** are homogeneous, luminescent assays that individually measure the chymotrypsin-like, trypsin-like and caspase-like protease activities associated with the proteasome complex in cultured cells. The 26S proteasome is a 2.5MDa multiprotein complex found in all eukaryotic cells. Proteasome-Glo™ Cell-Based Assays provide luminogenic proteasome substrates in buffers optimized for cell permeabilization, proteasome activity and luciferase activity. Addition of the Proteasome-Glo™ Cell-Based Reagent in an "add-mix-measure" format results in proteasome cleavage of the substrate and rapid generation of a luminescent signal produced by the luciferase reaction.

The three luminogenic substrates used to monitor specific protease activities include: Suc-LLVY-aminoluciferin for chymotrypsin-like, Z-LRR-aminoluciferin for trypsin-like, and Z-nLPnLD-aminoluciferin for caspase-like activity. Each luminogenic substrate is added to a buffer system optimized for its specific proteasome activity and luciferase activity. The reagents are added to cells in culture, and the proteasome cleaves the substrates, releasing luciferin, which is consumed by luciferase, producing "glow-type" luminescence correlating to enzyme activity or inhibition.

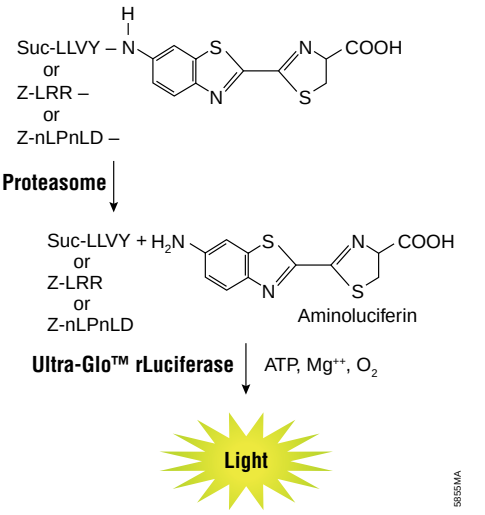
The **Proteasome-Glo™ Cell-Based 3-Substrate System** consists of three homogeneous bioluminescent assays that measure the three proteolytic activities associated with the proteasome in a cell-based format (each of these three assays also is available separately).

The **Proteasome-Glo™ 3-Substrate System** consists of three homogeneous bioluminescent assays in a purified enzyme-based format (each of these three assays also is available separately).

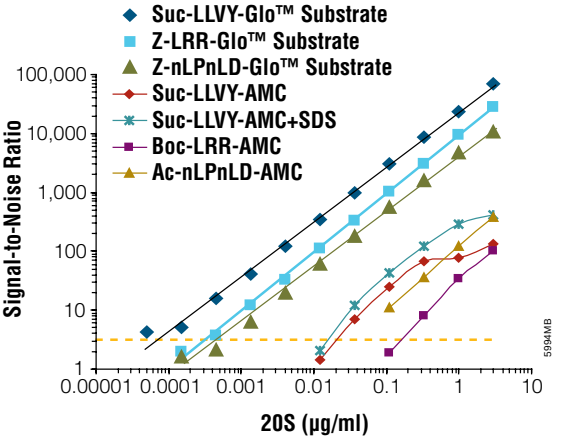
Features:

- **More Biologically Relevant Results:** Obtain activity data directly from a cellular environment with the Proteasome-Glo™ Cell-Based Assay.
- **Simplified Method:** The "add-mix-measure" protocol minimizes handling steps and makes the assays amenable to automation.
- **Faster Results:** Maximum sensitivity is reached 10–30 minutes after reagent addition.
- **Greater Sensitivity:** The luminescent assay format avoids inherent fluorescent background signals, providing excellent signal-to-background readings. The assays are miniaturizable to 384-well format.

Storage Conditions: Store the Proteasome-Glo™ Assay components at –20°C.



The luminogenic substrates containing the Suc-LLVY, Z-LRR or ZnLPnLD sequence are recognized by the 20S proteasome. Following cleavage by the 20S proteasome, the substrate for luciferase (aminoluciferin) is released, allowing the luciferase reaction to produce light.



Luminescent proteasome assays are more sensitive than fluorescent proteasome assays.

Calpain-Glo™ Protease Assay

Product	Size	Cat.#
Calpain-Glo™ Protease Assay	10 ml	G8501
	50 ml	G8502

For Research Use Only. Not for Use in Diagnostic Procedures.

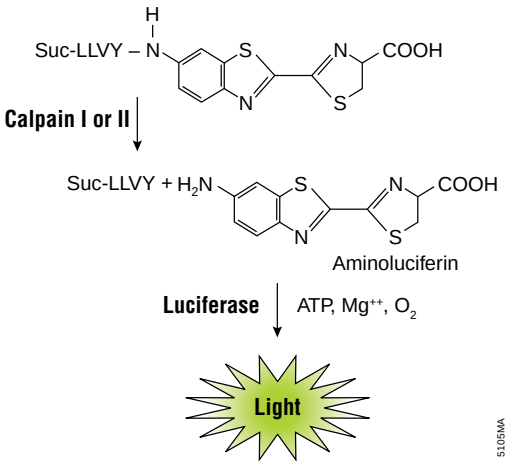
Description: The Calpain-Glo™ Protease Assay is a homogeneous, luminescent assay that measures calpain 1 (μ) and 2 (m) activities. Calpains are a family of calcium-activated cysteine proteases involved in cleaving a wide variety of proteins. Calpains modulate the biological activities of their substrates via limited proteolysis.

The Calpain-Glo™ Protease Assay provides a succinyl, proluminescent calpain substrate, Suc-LLVY-aminoluciferin, in a buffer system optimized for calpain and luciferase activities. The addition of the calpain reagent in an "add-mix-measure" format results in calpain cleavage of the substrate and rapid development of a "glow-type" luminescent signal produced by the luciferase reaction. The signal is proportional to the amount of calpain activity present. The assay is designed for use with purified enzyme preparations.

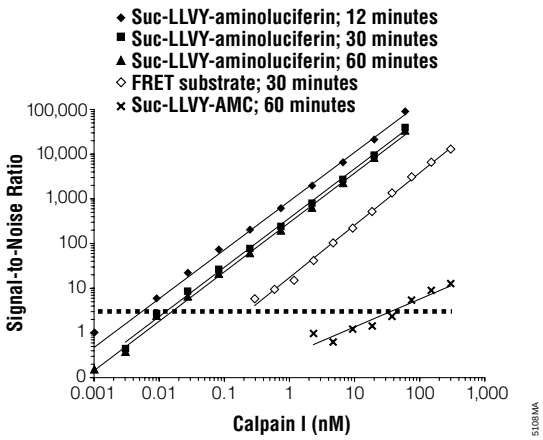
Features:

- **Faster Results:** The homogeneous, enzyme-coupled format is especially well suited for rapidly autolysed enzymes like calpain; maximum sensitivity is reached in as little as 10 minutes, while the enzyme is fully active.
- **Simple Protocol:** The homogeneous "add-mix-measure" protocol makes the assay easy to automate.
- **Greater Sensitivity:** The assay is up to 1,000 times more sensitive than competitive fluorometric assays. The luminescent assay avoids inherent fluorescent background signals, providing excellent signal-to-background readings. The assay is linear over 4 logs of calpain concentration.

Storage Conditions: Store components at –20°C protected from light.



The proluminescent substrate containing the Suc-LLVY sequence recognized by calpain. Following calpain cleavage, the substrate for luciferase (aminoluciferin) is released, allowing the luciferase reaction to occur and producing light.



Sensitivity of the Calpain-Glo™ Protease Assay compared to fluorescent assays.

Tryptase, Human, Recombinant, β

Product	Size	Cat.#
rhSkin β Tryptase	100 µg	G7061
rhLung β Tryptase	100 µg	G5631

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Tryptase is the predominant protein in mast cell granules and cleaves proteins at arginine and lysine residues. Tryptase is stored and released from mast cell granules upon activation. Mast cells are found in many tissues but are present in greater numbers along epithelial linings of the body, such as the skin, respiratory tract and gastrointestinal tract, as well as the perivascular tissue surrounding blood vessels. They are involved in a variety of physiological and pathophysiological states, including immediate hypersensitivity, delayed-type hypersensitivity, cell growth regulation, defense against neoplasia, and pain and itch sensation. They have also been implicated in chronic inflammatory states and are involved in neuroimmune interactions. The availability of recombinant human tryptase will aid in research directed toward a more complete understanding of the biological role(s) of tryptase and mast cells and the identification of tryptase in vivo targets.

Skin β_I Tryptase, Human, Recombinant (rhSkin β Tryptase) and Lung β_{II} Tryptase, Human, Recombinant (rhLung β Tryptase) are neutral serine proteases. The human β tryptase enzymes have been cloned and stably expressed in *Pichia pastoris* as fully active tetrameric enzymes and purified by affinity chromatography. The two enzymes differ in buffer formulation, enzyme concentration and glycosylation pattern. rhLung Tryptase is provided at a much higher concentration (2mg/ml) in minimal buffer without heparin for chromatographic studies and with glycosylation more closely resembling cadaveric enzyme as demonstrated by glycosidase digestion followed by Western analysis of the two recombinant enzymes and native lung tryptase.

Specific Activity: Measured as the rate of hydrolysis of 0.4mM Nα CBZ-L-Lysine Thiobenzyl Ester as substrate coupled with Ellman's Reagent (5,5′-Dithio-bis(5-Nitrobenzoic Acid)) in a final volume of 1ml, incubating for 1 minute at 25°C, and monitoring the absorbance change at 410nm. One unit is defined as 1.0 absorbance unit change per minute.

- rhSkin β Tryptase: >1,000 units/mg protein.
- rhLung β Tryptase: >1,200 units/mg protein.

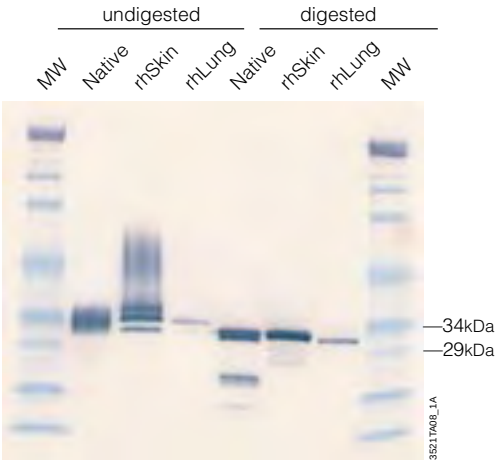
Concentration:

- rhSkin β Tryptase: 200µg/ml.
- rhLung β Tryptase: 2mg/ml.

Features:

- **High Specific Activity:** Specific activity is consistently 130–150% higher than native lung tryptase.
- **Consistent:** Recombinant protein expression results in uniform enzyme from batch to batch.
- **Safe:** Void of human pathogens associated with native cadaveric tryptase.
- **Pure:** Skin β and Lung β Tryptase are free of other contaminating proteases, providing more active enzyme per milligram of protein and eliminating extraneous protein interactions observed with native tryptase.

Storage Conditions: Store at –20°C.



Glycosidase digestion of human β tryptase with PNGase F yields single tryptase core protein. Western blot with Anti-Human Tryptase mAb (clone AA5, Cat.# G3361).

ADME Assays

For additional information see page 44.

Apoptosis Assays

For additional information see page 49.

Bioassays for Biologics

For additional information see page 30.

Cell Viability Assays

For additional information see page 58.

Cytotoxicity Assays

For additional information see page 63.

Oxidative Stress Assays

For additional information see page 70.

Metabolism Assays

For additional information see page 72.

Histone Deacetylase Assays

For additional information see page 81.

Nuclear Receptor Pathway Tools

For additional information see page 334.

Kinase Assays

For additional information see page 83.

9 Epigenetics

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

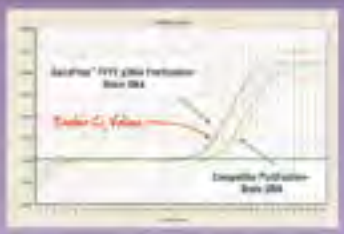
Workflow Solutions for DNA Methylation Analysis

Promega offers cutting-edge, effective and flexible solutions to streamline your DNA methylation analysis workflow.

- **Compatibility:** Instruments and chemistries designed to work together and provide higher throughput and greater reproducibility
- **Confidence:** Consistent, high-quality reagents from a trusted manufacturer from start to finish
- **Flexibility:** Maximize your sample diversity upstream and downstream

DNA Methylation workflow

Purification & Quantification



Promega offers DNA purification chemistries and automation platforms for variable sample sizes and throughput needs as well as fast, sensitive and fluorescence and PCR-based assays for accurate DNA quantitation.

Bisulfite Conversion

The MethylEdge™ Bisulfite Conversion System offers efficient bisulfite conversion and cleanup of DNA from a variety of sources in less than 2 hours, with reduced template fragmentation.

Downstream Analysis

Whether you need endpoint or real-time solutions, amplify your bisulfite-converted DNA with the most robust, reliable amplification tools on the market.

Start simplifying your workflow with solutions designed to work together:

www.promega.com/methylC

Promega

MethylEdge™ Bisulfite Conversion System

Product	Size	Cat.#
MethylEdge™ Bisulfite Conversion System	50 reactions	N1301
Available Separately	**Size**	**Cat.#**
Methylated Human Control	5 µg	N1231
Converted Methylated Human Control	1 µg	N1221

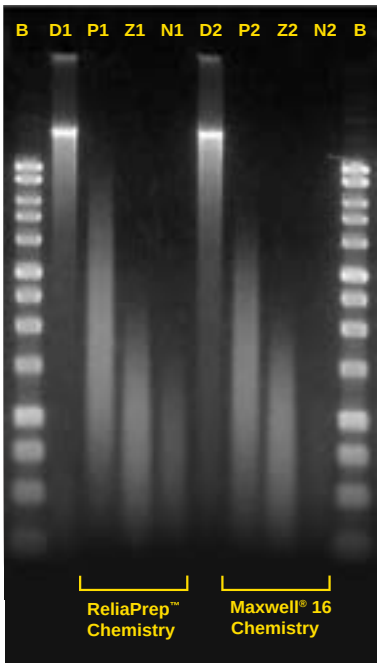
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MethylEdge™ Bisulfite Conversion System provides a rapid, efficient method to perform bisulfite conversion with minimal DNA fragmentation in less than two hours. The rapid protocol and complete conversion mean that you can produce completely converted DNA ready for your choice downstream assays with minimal preparation and hands-on time. Coupled with purification chemistries and flexible, robust amplification technologies for detection, the MethylEdge™ Bisulfite Conversion System delivers high-quality, intact converted DNA for your experiments.

Features:

- **Effective Conversion Reagents:** High-efficiency DNA conversion.
- **Rapid Protocol:** Time savings compared to other conversion systems.
- **Intact DNA:** Robust conversion of DNA with reduced DNA fragmentation.
- **Room-Temperature, Ready-to-Use Reagents:** Convenient system configuration allows room-temperature storage and minimal up-front preparation.

Storage Conditions: Store the MethylEdge™ Bisulfite Conversion System at 22–25°C (room temperature). Store the Methylated Human Control at 2–10°C. Store the Converted Methylated Human Control at –30 to –10°C.



Degree of DNA fragmentation after conversion. DNA was purified from whole blood using the ReliaPrep™ Blood gDNA Miniprep System (1) or Maxwell® 16 LEV Blood Kit (2) and was converted using the MethylEdge™ Bisulfite Conversion System (P) or a competing bisulfite conversion kit (Z or N). B = BenchTop 1kb DNA Ladder, D = nonconverted, purified DNA.

ReliaPrep™ Large Volume HT gDNA Isolation System

Product	Size	Conc.	Cat.#
ReliaPrep™ Large Volume HT gDNA Isolation System	96 × 10ml to 960 × 1ml preps		A1751
			A2751
HSM 2.0 Instrument	1 each		A2715
Alkaline Protease (APA)	130 ml		A1721
Cell Lysis Buffer (CLD)	1,400 ml		A1731
Binding Buffer (BBA)	1,600 ml		A1741
ReliaPrep™ Resin	115 ml		A1752
Prepared Wash Buffer (WBC)	3,500 ml		A2681
Proteinase K (PK) Solution	23 ml		A5051
Nuclease-Free Water	500 ml		P1197
Available Separately	**Size**	**Conc.**	**Cat.#**
RNase A Solution	5 ml	4 mg/ml	A7974
20X TE Buffer (pH 7.5)	25 ml		A2651
Tissue Lysis Buffer (TLA)	500 ml		A5091
Nuclease-Free Water	1,000 ml		P1199
HSM 2.0 Instrument Cover	1 each		A2712
HSM 2.0 Tube Rack	1 each		A2713
HSM 2.0 Tube Rack Stand	1 each		A2714
HSM 2.0 Instrument 1-Year Service Agreement	1 each		SA1330
ReliaPrep™ LV 32 HSM Standard Service Agreement	1 each		SA3070
Bottle for 50% Ethanol	1 each		A2691

A1751, A7974, A2651, A2751, A2715, A5091, A1721, P1199, A1731, A2712, A1741, A2713, A1752, A2714, A2681, A5051, SA3070, A2691, P1197 For Research Use Only. Not for Use in Diagnostic Procedures. A1751, A2751 and A2715 may not be available in all countries. Please contact your local representative for more information.

Description: The ReliaPrep™ Large Volume HT gDNA Isolation System isolates genomic DNA (gDNA) from 1–10ml of blood in a scalable format. The chemistry eliminates tedious centrifugation steps as well as the use of hazardous chemicals, which are inherent in precipitation-based chemistries. Each kit provides enough reagents to process up to 96 × 10ml whole blood samples. The system has been automated on robotic liquid-handling workstations, allowing walkaway purification of genomic DNA from 1–10ml of whole blood, regardless of sample storage or shipping conditions. For low-throughput isolation of gDNA from up to 32 samples at one time, the HSM 2.0 can be used in a manual mode, where the user performs the pipetting functions. The HSM has software that controls the instrument and directs the user through the purification protocol.

Features:

- **Decrease Hands-On Time:** Automation reduces operator time spent on instrument setup and takedown by allowing walkaway operation for large numbers of samples at a time.
- **Remove Protocol Bottlenecks:** Heater Shaker Magnet eliminates the need to move samples on the robot deck, reducing instrument failures; precipitation-free chemistry dramatically reduces purification failures.
- **Achieve Peace of Mind:** Automated liquid level sensing for all samples and solutions with operator notification allows recovery of samples in case of error.
- **Isolate Pure DNA from All Samples:** Purification chemistry is equally effective at recovering DNA from pristine as well as challenged (hemolysed or frozen) samples.
- **Save a Day or Two of Processing:** Samples are eluted in buffer, ready for use in downstream assays or archiving, eliminating resuspension of pelleted DNA, which can take 24–48 hours.
- **Reduce Waste:** Chemistry is automatically scaled for each sample, using only the reagent required for optimal purification. Plastic use is also conserved, reducing liquid and solid waste during sample runs.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ Blood gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ Blood gDNA Miniprep System	100 preps	A5081
	250 preps	A5082

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ Blood gDNA Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 200µl of blood or body fluid, consistently isolating pure, intact gDNA without the use of alcohol washes or precipitations. Genomic DNA can be prepared from fresh or frozen blood in less than 40 minutes with expected DNA yields of 4–10µg, depending on the white blood cell count of the blood sample.

Features:

- **Easy to Use:** Reagents are supplied "ready to go"; no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less.
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users, even with hemolyzed samples.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ gDNA Tissue Miniprep System

Product	Size	Cat.#
ReliaPrep™ gDNA Tissue Miniprep System	100 preps	A2051
	250 preps	A2052

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ gDNA Tissue Miniprep System provides a complete, ready-to-use method for purification of gDNA from up to 25mg of tissue, a buccal (cheek) swab, or a 1cm mouse tail snip, obtaining intact gDNA without the use of ethanol washes or precipitations.

Features:

- **Easy to Use:** Reagents are supplied "ready-to-use"—no additions required.
- **Save Time:** Eluted DNA obtained in 30 minutes or less (hands-on time).
- **No Ethanol:** Eliminates alcohol inhibition and carryover.
- **Pure gDNA:** Improved A_{260}/A_{230} ratios vs. the leading competitor.
- **Peace of Mind:** Consistent results from run to run and between users.
- **Concentrated DNA:** Good recovery and purity in as little as 50µl elution.

Storage Conditions: Store at 15–30°C.

ReliaPrep™ FFPE gDNA Miniprep System

Product	Size	Cat.#
ReliaPrep™ FFPE gDNA Miniprep System	10 reactions	A2351
	100 reactions	A2352
Available Separately	**Size**	**Cat.#**
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ReliaPrep™ FFPE gDNA Miniprep System provides a complete, all-inclusive method for purifying quality genomic DNA from formalin-fixed paraffin-embedded tissue without using hazardous solvents or overnight digestion. Genomic DNA can be isolated from FFPE tissue in approximately two and one-half hours with minimal hands-on time.

Features:

- **Isolate Quality, Intact gDNA:** Optimized lysis and binding conditions reverse modifications introduced by the fixation process, resulting in intact, amplifiable gDNA.
- **Safely Deparaffinize Your Sample:** Deparaffinization step occurs without harsh organic solvents.
- **Save Time:** Purify gDNA from FFPE tissue in less than two and one-half hours with minimal hands-on time. No overnight digestion required.
- **Easy to Use:** Minimal preparation time; simply add ethanol and go!

Storage Conditions: Store at room temperature.

Maxwell® 16 System DNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV Blood DNA Kit	48 preps	AS1290
Maxwell® 16 FFPE Plus LEV DNA Purification Kit	48 preps	AS1135
Maxwell® 16 Cell LEV DNA Purification Kit	48 preps	AS1140
Maxwell® 16 Buccal Swab LEV DNA Purification Kit	48 preps	AS1295
Maxwell® 16 Viral Total Nucleic Acid Purification System	48 preps	AS1155
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit	48 preps	AS1130
Standard Elution Volume (SEV)		
Maxwell® 16 Blood DNA Purification Kit	48 preps	AS1010
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015
Maxwell® 16 Cell DNA Purification Kit	48 preps	AS1020
Maxwell® 16 Tissue DNA Purification Kit	48 preps	AS1030
Maxwell® 16 Mouse Tail DNA Purification Kit	48 preps	AS1120
Available Separately		
Maxwell® 16 Instrument	1 each	AS2000
Maxwell® 16 MDx Instrument	1 each	AS3000
LEV Plungers	50 /pk	AS6101
Elution Tubes (LEV)	50 /pk	AS6201
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
Elution Buffer, Blood	45 ml	MD1421
Plungers (SEV)	50 /pk	AS5201
Elution Tubes (SEV)	50 /pk	AS5101

AS1290, AS1135, AS1140, AS1295, AS1150, AS1010, AS1020, AS1030, AS1120 For Laboratory Use. AS2000, AS3000, AS6101, AS6201, V1231, V4741, MD1421, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures. AS1015, AS1155 For In Vitro Diagnostics Use. This product is only available in certain countries.

Description: The Maxwell® 16 Genomic DNA Purification Kits are designed for use with the Maxwell® 16 Instrument. DNA purification kits are provided with corresponding optimized automated methods. You get consistent yield and purity from easy-to-use automation.

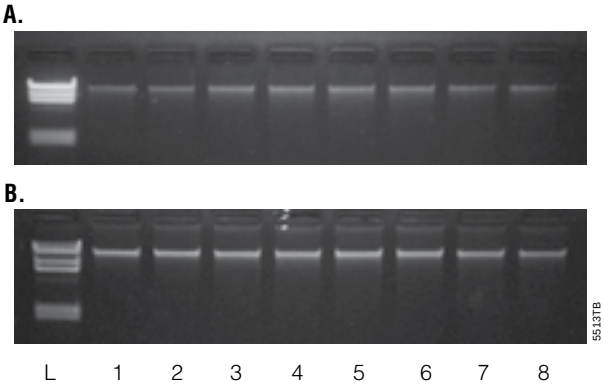
For genomic DNA purification, the Maxwell® 16 System is the only system that makes purification from tissue as easy as purification from blood or cells. The action of the plunger grinds solid tissue samples directly in the lysis buffer in the prefilled reagent cartridges. Integrated grinding replaces time- and labor-intensive use of lytic enzymes such as proteinase K or manual tissue grinding prior to purification.

Kits for optimized DNA purification from eukaryotic tissue, blood, cells, mouse tail and FFPE tissue sections are available. Protocols for a variety of new samples are being developed. The Maxwell® 16 DNA Purification Kits are General Purpose Medical Devices (GPR) in the USA. For up-to-date information visit: **www.promega.com/maxwell16/**

Features:

- **Achieve High Yield:** Efficient processing and higher sample capacity than comparable systems.
- **Enjoy Amazing Speed:** Hands-free purification of genomic DNA in 18–30 minutes.
- **Get More Time:** Easily process tissues and cells.

Maxwell® 16 Instrument (Cat.# AS3000) with optional bar code reader.



Genomic DNA purified from 8 samples of 200µl of whole human blood (Panel A) and 8 samples of 1cm of mouse tail (Panel B) was visualized on a 1% agarose gel stained with ethidium bromide. Lane L, Lambda DNA/HindIII Markers (Cat.# G1711); Lanes 1–8, 5µl of purified genomic DNA.

DNA Yields from Various Starting Materials.

Sample Type	Sample Size	Yield
Whole blood	200µl	4–9µg (>3pg/white blood cell)
Whole blood	400µl	8–15µg (>3pg/white blood cell)
Mouse tail	1.2cm	20µg
Animal tissue	20–25mg	60–100µg (mouse liver)
Tissue culture cells	5×10^6	10µg (HeLa)
Gram– bacteria	2×10^9	10µg (BL21)
Gram+ bacteria	2×10^9	1µg (*B. cereus*)
Plant leaf (tomato)	25mg	10µg

9482LA

Available in the Helix® on-site stocking system

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Luciferase-Based Methylation Detection

Dual-Glo® Luciferase Assay System

Product	Size	Cat.#
Dual-Glo® Luciferase Assay System	10 ml	E2920
	100 ml	E2940
	10 × 100 ml	E2980

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Dual-Glo® Luciferase Assay System is a homogeneous reagent system that enables fast and simple quantitation of a stable luminescent signal from two reporter genes in a single sample. This convenient "add-and-read" system generates both firefly and *Renilla* luciferase luminescence signals from cells that have not been preconditioned or prelysed. The Dual-Glo® Luciferase Assay System provides high Z´-factors for cell-based, high-throughput screening applications. With the Dual-Glo® System, internal controls can be established to minimize sample variability by reducing false-positive and false-negative readings caused by nonspecific factors such as cytotoxicity. In the Dual-Glo® Luciferase Assay, the activity of the primary reporter is correlated with the effect of specific stimuli, and the activity of the co-transfected control reporter provides an internal control to normalize results. The system is optimized for batch processing both 96- and 384-well plates and is compatible with a wide variety of mammalian cell culture media.

Features:

- **Increased Precision and Accuracy:** Normalize primary reporter results with an internal control, a co-reporter that minimizes effects of cell number and health, transfection efficiency and nonspecific cellular responses.
- **Homogeneous Format:** Perform fewer steps. Assay cells directly in growth medium for both reporters. No centrifugation or lysis steps required.
- **Stable Signal:** Obtain flexibility for either batch or continuous processing of 96- and 384-well plates. Each luminescent signal can be measured for up to 2 hours after reagent addition.
- **Convenience:** Screen efficiently with simple, two-step assay ideal for any luminometer. On-board injectors not required.
- **Wide Dynamic Range:** Analyze high and low reporter activity without sample dilution. Linear over at least 6 logs of enzyme concentration for each reporter.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Dual-Glo® Substrates at –20°C. Store Dual-Glo® Buffers below 25°C.

Nano-Glo® Luciferase Assay System

Product	Size	Cat.#
Nano-Glo® Luciferase Assay	10 ml	N1110
	10 × 100 ml	N1150
	100 ml	N1120
	10 × 10 ml	N1130

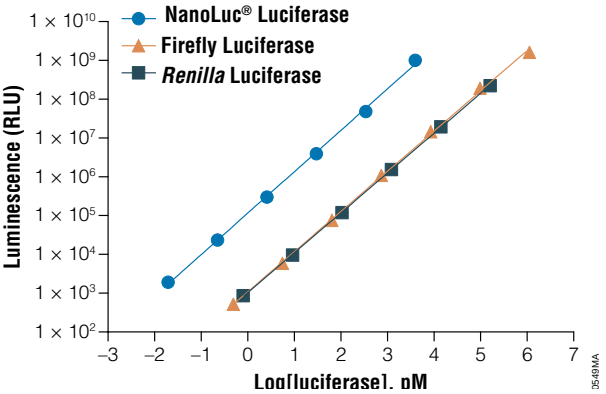
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® Luciferase Assay System provides a simple, single-addition reagent that generates a glow-type signal in the presence of NanoLuc® luciferase with a half-life of approximately 120 minutes in commonly used tissue culture media. The reagent is prepared by mixing Nano-Glo® Luciferase Assay Substrate and Nano-Glo® Luciferase Assay Buffer. The reagent contains an integral lysis buffer allowing use directly on cells expressing NanoLuc® luciferase or the culture media when luciferase is secreted.

Nano-Glo® Luciferase Assay Reagent is a dedicated product for the detection of NanoLuc® Luciferase. For more details on NanoLuc® Luciferase, visit: **www.promega.com/nanoluc**

Features:

- **Advanced Reporter System:** Bright NanoLuc® reporter allows use in challenging applications where sensitivity is limited.
- **Simplified Assay Optimization:** Add-and-read simplicity allows scaling from bench to HTS.
- **Improved Assay Precision:** No need for separate lysis and reagent injection steps.
- **Brighter, Longer-Lasting Signal:** Extended bright light output is optimized for batch and continuous-process handling.
- **Greater Sensitivity:** Low background formulation offers increased sensitivity.



A comparison of the sensitivity of NanoLuc®, firefly and *Renilla* luciferase assays.

Steady-Glo® Luciferase Assay System

Product	Size	Cat.#
Steady-Glo® Luciferase Assay System	10 ml	E2510
	100 ml	E2520
	10 × 100 ml	E2550

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High-throughput quantitation of firefly (*Photinus pyralis*) luciferase expression in mammalian cells is commonly performed by batch processing of 96- and 384-well plates. Steady-Glo® Luciferase Assay System is designed for this purpose by providing long-lived luminescence when added to cultured cells. The homogeneous assay provides signal half-lives of over 5 hours in commonly used cell culture media without prior sample processing. Throughput rates of several thousand samples per hour may be achieved with high reproducibility under standard laboratory conditions.

Features:

- **Greater Light Output:** Greater assay sensitivity than other leading extended-lifetime firefly luciferase assay reagents.
- **Improved Assay Precision and Reproducibility:** Less sensitive to mixing conditions in multiwell plates. Particularly useful in 384-well plates.
- **Convenience:** Simply mix buffer with lyophilized substrate and add to cells in culture medium; no need to thaw or measure before use.
- **No Sample Preprocessing:** No need to remove culture medium or wash cells prior to adding assay reagent. Grow cells and assay them directly within the same multiwell plate.
- **Easy to Use:** Simply add reagent, which contains a cell lysis component, wait 5 minutes and measure luminescence.
- **Robust:** Compatible with many tissue culture media, including those containing up to 10% serum.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Steady-Glo® Luciferase Assay Substrate at –20°C. Store Steady-Glo® Luciferase Assay Buffer below 25°C.

Transfection Reagents

FuGENE® HD Transfection Reagent

Product	Size	Cat.#
FuGENE® HD Transfection Reagent	1 ml	E2311
	5 × 1 ml	E2312

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: FuGENE® HD Transfection Reagent is a novel, nonliposomal formulation designed to transfect DNA into a wide variety of cell lines with high efficiency and low toxicity. The protocol does not require removal of serum or culture medium and does not require washing or changing of medium after introducing the reagent/DNA complex. Additionally, the FuGENE® HD Transfection Reagent has been shown to support transfection in chemically defined media and does not contain any animal-derived components.

Features:

- **More Biologically Relevant:** Low toxicity, less impact on biology.
- **Simple Protocol:** No culture changes, less variability, compatible with serum.
- **Effective in Many Cell Types:** Online database with over 40 cell types, including primary and stem cells.
- **Ideal for Use with Luciferase Assays:** More expression, sensitive results.

Storage Conditions: Store FuGENE® HD Transfection Reagent at 4°C. Do not freeze or store below 0°C.

Methylation-Specific Restriction Enzymes

Product	Size	Conc.	Cat.#
HpaII	1,000 u	10 u/µl	R6311
	5,000 u	10 u/µl	R6315
MboI	200 u	8–12 u/µl	R6711
MspI	2,000 u	10 u/µl	R6401
MboI	200 u	8–12 u/µl	R6711
MspI	2,000 u	10 u/µl	R6401
	10,000 u	10 u/µl	R6405
MspI (HC)	10,000 u	40–80 u/µl	R4404
Sau3AI	100 u	3–10 u/µl	R6191
	500 u	3–10 u/µl	R6195

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Available in the Helix® on-site stocking system

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PCR Technologies

GoTaq® Hot Start Polymerase

Product	Size	Cat.#
GoTaq® Hot Start Polymerase	100 u	M5001
	500 u	M5005
	2,500 u	M5006
	10,000 u	M5008
GoTaq® Hot Start Green Master Mix	100 reactions	M5122
	1,000 reactions	M5123
GoTaq® Hot Start Colorless Master Mix	100 reactions	M5132
	1,000 reactions	M5133

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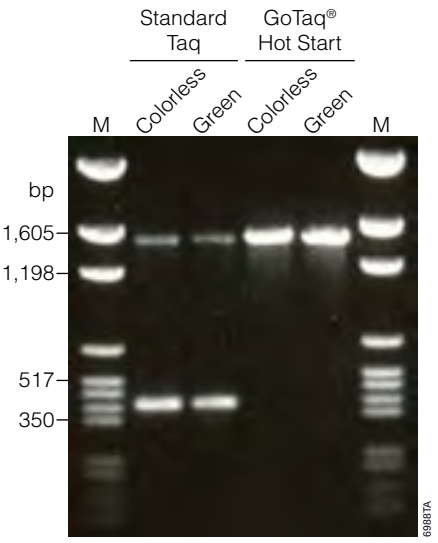
Description: GoTaq® Hot Start Polymerase contains the high-performance GoTaq® DNA Polymerase bound to a proprietary antibody that blocks polymerase activity. The polymerase activity is restored during the initial denaturation step when the amplification reactions are heated at 94–95°C for two minutes. This enables hot-start PCR, where polymerase activity is eliminated or minimized at temperatures below 70°C. GoTaq® Hot Start Polymerase exhibits 5′→3′ exonuclease activity. The system is supplied with a tube of 25mM $MgCl_2$, allowing optimization of the magnesium concentration in your reactions. It is also supplied with 5X Green GoTaq® Flexi Buffer and 5X Colorless GoTaq® Flexi Buffer. The buffers contain a compound that increases sample density, so that samples sink easily into wells of an agarose gel. The green buffer also contains two dyes (yellow and blue) that separate to allow easy monitoring during electrophoresis. Use the green reaction buffer for direct-to-gel analysis after amplification and the colorless reaction buffer for amplifications where the dyes may interfere with post-amplification analysis such as fluorescence or absorbance testing.

GoTaq® Hot Start Master Mixes are premixed, ready-to-use solutions containing GoTaq® Hot Start Polymerase, magnesium, dNTPs and buffer. Reactions can be set up in less than a minute at room temperature; simply add your template, water and primers. Available with either green or colorless reaction buffers, which also serve as loading buffers, allowing you to go directly from thermal cycler to gel analysis. GoTaq® Hot Start Master Mixes offer the specificity and sensitivity of an antibody-based hot-start polymerase in a convenient, easy-to-use, time-saving format.

Features:

- **Enhanced Yield, Sensitivity and Specificity:** The proven, robust amplification and sensitivity of GoTaq® DNA Polymerase now with built-in hot start to deliver even more superior results.
- **Ease of Use:** Set up your reaction at room temperature—no need to set up on ice.
- **Higher Yield:** Two-minute activation saves time and ensures maximum enzyme activity.
- **Higher Specificity:** Minimize nonspecific amplification and primer-dimers.
- **Improve Productivity:** Go directly from PCR to gel analysis. Green GoTaq® Reaction Buffer serves as both reaction buffer and gel-loading solution.
- **Convenience:** One tube, one pipetting step. Only add template and primers when using the master mixes.
- **Optimization:** Control the magnesium concentration in your reaction for specialized templates when using the standalone polymerase.

Storage Conditions: Store at –30 to –10°C.



Improve amplification of targets that require hot start using GoTaq® Hot Start Polymerase. A 1.5kb fragment of a *Corynephage* omega gene that requires hot start PCR was amplified from 500pg of plasmid DNA using either standard *Taq* or GoTaq® Hot Start Polymerase in Green and Colorless Flexi Reaction Buffers. Use of GoTaq® Hot Start Polymerase resulted in amplification of only the target 1.5kb fragment. Using standard *Taq* DNA Polymerase, a nonspecific 410bp product also was amplified.

GoTaq® Long PCR Master Mix

Product	Size	Cat.#
GoTaq® Long PCR Master Mix	100 reactions	M4021

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Description: GoTaq® Long PCR Master Mix contains the high-performance GoTaq® Hot Start Polymerase in a specially formulated mixture with a proprietary thermostable proofreading polymerase. This optimized enzyme mixture allows efficient amplification of up to 40kb from lambda DNA or 30kb from human genomic DNA. The presence of a proofreading enzyme to repair DNA mismatches and a highly processive polymerase allows the polymerase to continue to elongate the DNA much further, resulting in longer DNA amplification.

The optimized formulation of the GoTaq® Long PCR Master Mix components enables simple reaction setup and provides consistently efficient, accurate and robust amplification of long DNA amplicons.

Features:

- **Easy:** Hot-start master mix for convenient handling and simple setup.
- **Enhanced:** Yield, sensitivity and specificity with optimized components.
- **Accurate:** Blend of thermostable DNA polymerases with enhanced processivity and proofreading.
- **Confident:** Control primer pair and human gDNA template to perform control reactions and test template quality.
- **Efficient:** Perfect for cloning genes, mutational analysis and DNA sequencing.

Storage Conditions: Upon arrival, store all components at –30 to –10°C, protected from light. For immediate use, components may be stored at 2–8°C, protected from light, for up to 3 months.

GoTaq® Real-Time qPCR and RT-qPCR Systems for Probe-Based Detection

Product	Size	Cat.#
GoTaq® Probe qPCR Master Mix	200 reactions	A6101
	1,000 reactions	A6102
GoTaq® Probe 2-Step RT-qPCR System	200 reactions	A6110
GoTaq® Probe 1-Step RT-qPCR System	200 reactions	A6120

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For additional information see page 270.

GoTaq® Real-Time qPCR and RT-qPCR Systems for Dye-Based Detection

Product	Size	Cat.#
GoTaq® qPCR Master Mix	200 × 50µl reactions	A6001
	1,000 × 50µl reactions	A6002
GoTaq® 1-Step RT-qPCR System	200 × 50µl reactions	A6020
GoTaq® 2-Step RT-qPCR System	50 × 20µl RT reactions + 200 × 50µl qPCR reactions	A6010

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For additional information see page 270.

Cell-Based and Biochemical Assays

HDAC-Glo™ I/II Assays and Screening Systems

Product	Size	Conc.	Cat.#
HDAC-Glo™ I/II Assay	10 ml		G6420
	5 × 10 ml		G6421
	100 ml		G6422
HDAC-Glo™ I/II Screening System	10 ml		G6430
	5 × 10 ml		G6431
Available Separately	**Size**	**Conc.**	**Cat.#**
Trichostatin A	10 µl	10 mM	G6560
HeLa Nuclear Extract	10 µl	5 mg/ml	G6570
HDAC-Glo™ I/II Control Substrate	10 µl		G6550

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HDAC-Glo™ I/II Assays and Screening Systems are single-reagent-addition, homogeneous, luminescent assays that measure the relative activity of histone deacetylase (HDAC) class I and II enzymes from cells, extracts or purified enzyme sources. The assays use an acetylated, live-cell-permeant, luminogenic peptide substrate that can be deacetylated by HDAC activities. Deacetylation of the peptide aminoluciferin substrate is measured using a coupled enzymatic system in which a protease in the Developer Reagent cleaves the deacetylated peptide from the aminoluciferin substrate, releasing aminoluciferin, which is quantified in a reaction using Ultra-Glo™ recombinant firefly luciferase. The assay reaction is typically complete within 15–45 minutes with no sample manipulation. The HDAC-mediated luminescent signal is persistent, with a half-life of greater than 3 hours, allowing batch processing of multiwell plates. The HDAC assay is broadly useful for class I and II enzymes.

The Trichostatin A, included in the HDAC-Glo™ I/II Screening Systems or available separately, is a known pan HDAC inhibitor that may be used as a positive control inhibitor. The Trichostatin A is supplied at a concentration of 10mM in DMSO.

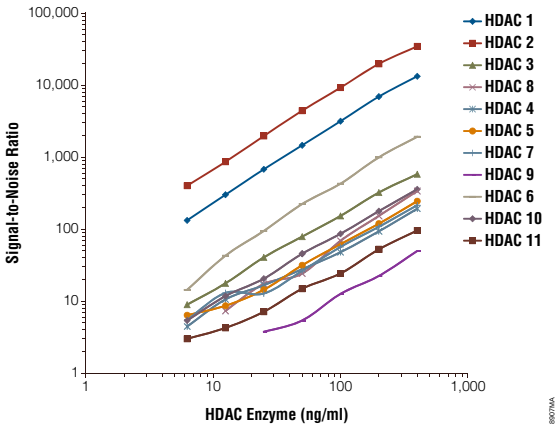
The HeLa Nuclear Extract, included in the HDAC-Glo™ I/II Screening Systems or available separately, may be used as a source of histone deacetylase activity. The diluted extract also can be used as an HDAC-Glo™ I/II Assay chemistry control.

The HDAC-Glo™ I/II Control Substrate, only available separately, is a non-acetylated form of the HDAC-Glo™ I/II Substrate with the same amino acid sequence and can be used with the HDAC-Glo™ I/II Assays and Screening Systems to confirm true HDAC inhibition in secondary screens. The Control Substrate is supplied at a concentration of 10mM and is sufficient for 480 assays in 96-well plate format when combined with the HDAC-Glo™ Reagent prepared with components in the HDAC-Glo™ I/II Assays or Screening Systems.

Features:

- **Simple Measurement of Deacetylating Activities:** Use a single-reagent-addition, homogeneous, add-mix-measure protocol for easy implementation from benchtop to screening.
- **Highly Sensitive:** Obtain 10- to 100-fold higher sensitivity than comparable fluorescence methods.
- **Fast Data Acquisition:** Achieve maximum signal in as little as 15 minutes with persistent glow-type steady-state signal, making the protocol amenable to automation in high-throughput formats and compatible with luminometers without injectors.
- **Flexible to Sample Type:** Use with viable cells, extracts or purified recombinant enzyme sources.

Storage Conditions: Store the HDAC-Glo™ Assay components and HDAC-Glo™ I/II Control Substrate (sold separately) at –20°C. Store HeLa Nuclear Extract at –70°C.



Broad linearity with HDAC Class I and II enzymes.

Available in the Helix® on-site stocking system

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SIRT-Glo™ Assays and Screening Systems

Product	Size	Cat.#
SIRT-Glo™ Assay	10 ml	G6450
	5 × 10 ml	G6451
	100 ml	G6452
SIRT-Glo™ Screening System	10 ml	G6470
	5 × 10 ml	G6471

Available Separately	Size	Conc.	Cat.#
Nicotinamide	30 µl	1 M	G6540
HeLa Nuclear Extract	10 µl	5 mg/ml	G6570
SIRT-Glo™ Control Substrate	35 µl		G6460

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The SIRT-Glo™ Assays and Screening Systems are single-reagent-addition, homogeneous, luminescent assays that measure the relative activity of the NAD^+-dependent histone deacetylase (HDAC) class III enzymes (sirtuins; SIRTs) from purified enzyme sources. The assays use an acetylated, luminogenic peptide substrate that can be deacetylated by SIRT activities. Deacetylation of the peptide aminoluciferin substrate is measured using a coupled enzymatic system in which a protease in the Developer Reagent cleaves the deacetylated peptide from the aminoluciferin substrate, releasing aminoluciferin, which is quantified in a reaction using Ultra-Glo™ recombinant firefly luciferase. The assay reaction is typically complete within 15–45 minutes with no sample manipulation. The SIRT-mediated luminescent signal is persistent with a half-life of greater than 3 hours, allowing batch processing of multiwell plates. The SIRT-Glo™ Assay is broadly useful for NAD^+-dependent Sirtuin enzymes.

Nicotinamide, included in the SIRT-Glo™ Screening Systems or available separately, is a known inhibitor of SIRTs and used as a positive control inhibitor. Nicotinamide is supplied at a concentration of 1M in SIRT-Glo™ Buffer.

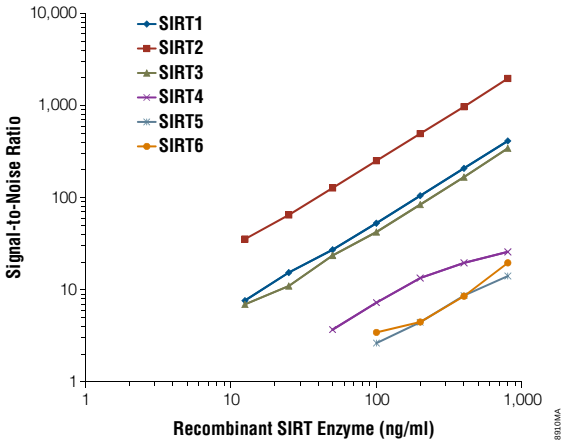
The HeLa Nuclear Extract, included in the SIRT-Glo™ Screening Systems or available separately, may be used as an assay chemistry control. HeLa Nuclear Extract is supplied at a concentration of 5mg/ml.

The SIRT-Glo™ Control Substrate, only available separately, is a non-acetylated form of the SIRT-Glo™ Substrate with the same amino acid sequence and can be used with the SIRT-Glo™ Assays and Screening Systems to confirm true SIRT inhibition in secondary screens. The Control Substrate is supplied at a concentration of 10mM and is sufficient for 480 assays in 96-well plate format when combined with the SIRT-Glo™ Reagent prepared with components in the SIRT-Glo™ Assays or Screening Systems.

Features:

- **Simple Measurement of Deacetylating Activities:** Use a single-reagent-addition, homogeneous, add-mix-measure protocol for easy implementation from benchtop to screening.
- **Highly Sensitive:** Achieve 10- to 100-fold higher sensitivity than comparable fluorescence methods.
- **Fast Data Acquisition:** Measure maximum signal in as little as 10-15 minutes with persistent glow-type steady-state signal.

Storage Conditions: Store the SIRT-Glo™ Assay components and SIRT-Glo™ Control Substrate at –20°C. Store HeLa Nuclear Extract at –70°C.



Broad linearity and isoenzyme utility.

DUB-Glo™ Protease Assay

Product	Size	Cat.#
DUB-Glo™ Protease Assay (DUB/SENP/NEDP)	10 ml	G6260
	50 ml	G6261

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DUB-Glo™ Protease Assay (DUB/SENP/NEDP) is a homogeneous, bioluminescent assay that measures the activity of numerous deconjugating enzymes including deubiquitinating (DUB), deSUMOylating (SENP) and deneddylating (NEDP) proteases. These proteases reverse the protein modification by ubiquitin and ubiquitin-like proteins (Ubl proteins) and thus are integral components in the complex mechanisms of posttranslational protein regulation in eukaryotes.

Features:

- **Greater Sensitivity:** The luminescent format provides enough sensitivity to enable use of a simple peptide-based substrate, Z-RLRGG-aminoluciferin, for assaying deconjugating proteases. Fluorescence generally requires the use of full-length substrates.
- **Broad Dynamic Range:** The assays are linear over 2–3 logs of deconjugating protease concentrations.
- **Signal Stability:** The coupled-enzyme format results in very stable signal with a half-life >3 hours. Substrate depletion is not a concern as it is when using the full-length substrates, Ub-AMC, SUMO-AMC or Nedd8-AMC.
- **Fast:** Maximum sensitivity is reached in 10–30 minutes after reagent addition because the signal is not dependent on accumulation of cleaved product for sensitivity in the coupled-enzyme format.
- **Accurate and Robust:** The broad linear range and excellent sensitivity readily translate to accurate kinetic analysis of inhibitors. Assays can be scaled to 384-well with suitable Z′ factors.
- **Greater Flexibility:** The K_m values for the peptide substrates are much higher than they are for full-length substrates, yet the sensitivity of the luminescent assay allows the assay to be run significantly below K_m while still achieving good signal-to-background ratios for extended time periods. A single luminescent substrate concentration can be used for a wide variety of DUB/SENP/NEDP proteases without worrying about substrate depletion or substrate inhibition.
- **Batch-Processing Capability:** The homogeneous coupled-enzyme format results in a continuous signal, providing excellent stability and allowing plates to be read over an extended period of time.

Storage Conditions: Store components at –20°C protected from light.

ApoTox-Glo™ Triplex Assay

Product	Size	Cat.#
ApoTox-Glo™ Triplex Assay	10 ml	G6320
	5 × 10 ml	G6321

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ApoTox-Glo™ Triplex Assay combines three assay chemistries to easily assess viability, cytotoxicity and apoptosis events in the same cell-based assay well. First, viability and cytotoxicity are determined by measuring two differential protease biomarkers simultaneously with the addition of a single nonlytic reagent containing two peptide substrates. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (GF-AFC Substrate). The substrate enters intact cells, where it is cleaved to generate a fluorescent signal proportional to the number of living cells. This live-cell protease activity marker becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, cell-impermeant, fluorogenic peptide substrate (bis-AAF-R110 Substrate) is used simultaneously to measure dead-cell protease activity that has been released from cells that have lost membrane integrity. This results in ratiometric, inversely correlated measures of cell viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. A second reagent containing luminogenic DEVD-peptide substrate for caspase-3/7 and Ultra-Glo™ Recombinant Thermostable Luciferase is added. Caspase-3/7 cleavage of the substrate releases luciferin, which is a substrate for luciferase and generates light. The light output, measured with a luminometer, correlates with caspase-3/7 activation as a key indicator of apoptosis.

Features:

- **Measure Viability, Cytotoxicity and Apoptosis in the Same Sample Well:** Determine mechanism of cell death for cells in the same sample well.
- **Easily Implement:** Assay follows a simple sequential "add-mix-measure" format.
- **Normalize Data with a Built-In Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and normalizes data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Flexible and Easily Automated:** The volumes of each assay component can be scaled to meet throughput needs and is amenable to automation in 96- and 384-well plates.
- **Improves Efficiency and Saves on Lab Budget:** Reduces cell culture and labor costs by performing three assays in a single well.

Storage Conditions: Store all components at –20°C protected from light.

MultiTox-Glo Multiplex Cytotoxicity Assay

Product	Size	Cat.#
MultiTox-Glo Multiplex Cytotoxicity Assay	10 ml	G9270
	5 × 10 ml	G9271
	2 × 50 ml	G9272

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MultiTox-Glo Multiplex Cytotoxicity Assay is a sequential-reagent-addition fluorescent and luminescent assay that measures the relative number of live and dead cells in cell populations. The MultiTox-Glo Assay sequentially measures two protease activities; one is a marker of viability, and the other is a marker of cytotoxicity. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant, peptide substrate (GF-AFC). This substrate enters intact cells, where it is cleaved by the live cell protease activity to release AFC and generate a fluorescent signal that is proportional to the number of viable cells. The live-cell protease becomes inactive upon loss of membrane integrity and leakage into the surrounding culture medium. A second, luminogenic cell-impermeant peptide substrate (AAF-aminoluciferin) is used to measure dead-cell protease activity, which is released from cells that have lost membrane integrity. The liberated aminoluciferin product is measured as "glow type" luminescence generated by Ultra-Glo™ Recombinant Luciferase provided in the assay reagent.

The MultiTox-Glo Assay gives ratiometric, inversely correlated measures of cell viability and cytotoxicity, which correlate with established methods for measuring viability and cytotoxicity. The ratio of viable cells to dead cells is independent of cell number and, therefore, can be used to normalize data. Having complementary cell viability and cytotoxicity measures reduces errors associated with pipetting and cell clumping, as well as serving as an internal control to allow identification of errors resulting from chemical interference from test compounds or media components.

Features:

- **Measure the Number of Live Cells and Dead Cells in Culture:** Sequential-reagent-addition assay with a homogeneous "add-mix-measure" protocol.
- **Normalize Data with a Built-In Internal Control:** The ratio of the number of live cells/number of dead cells is independent of cell number and can be used to normalize data. This normalization makes results more comparable well-to-well, plate-to-plate and day-to-day.
- **Immediately Identify More False-Positives and False-Negatives:** Independent cell viability and cytotoxicity measurements serve as controls for each other. If test compounds interfere with one assay chemistry, the other serves as an internal control.
- **Improve your Data:** Reduce statistical probability of false-positives (or false-negatives), and eliminate fluorescence interference issues by luminescence readout.

Storage Conditions: Store at –20°C, protected from light.

Available in the Helix® on-site stocking system

Protein Analysis and Complex Purification

HaloTag® Mammalian Protein Purification System

Product		Size	Cat.#
HaloTag® Mammalian Protein Detection and Purification System		1 each	G6795
HaloTag® Mammalian Protein Purification System		1 each	G6790
HaloTag® Mammalian Protein Detection and Purification System Sample Pack		1 each	G6799
Available Separately	**Size**	**Conc.**	**Cat.#**
HaloTEV Protease	1,000 u	5 u/µl	G6601
	4,000 u	5 u/µl	G6602
HaloTag® TMRDirect™ Ligand	30 µl	0.1 mM	G2991
Protease Inhibitor Cocktail, 50X	1 ml		G6521

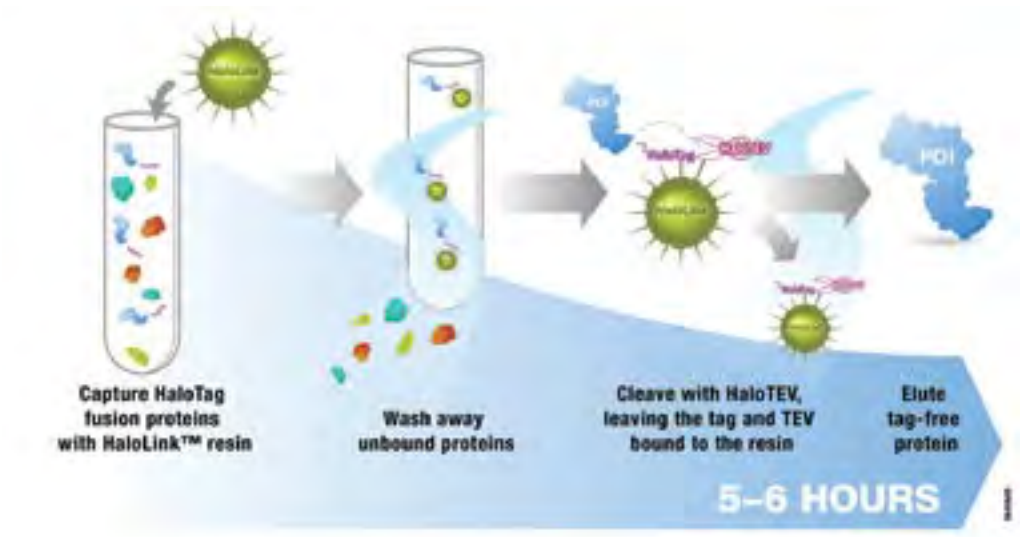
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Mammalian Protein Purification System (Cat.# G6790) is an optimized kit for purification of HaloTag® fusion proteins from mammalian cell culture lysates. HaloTag® fusion proteins form a highly specific and covalent bond with the HaloLink™ Resin. The covalent binding coupled with the low nonspecific binding of the HaloLink™ Resin provides superior purity and recovery of recombinant proteins from cultured mammalian cells, even at low expression levels. The HaloTag® Mammalian Protein Detection and Purification System (Cat.# G6795) also includes HaloTag® TMRDirect™ Ligand. The simple-to-use fluorescent detection of the HaloTag® fusion facilitates rapid optimization of expression and purification conditions.

Features:

- **Purify More Protein:** HaloLink™ Resin covalently binds >7mg/ml of HaloTag® fusion protein (10X more capacity compared to FLAG®). Recovery is highly efficient, commonly >75%.
- **Higher Purity:** Covalent capture allows extensive and/or stringent washes without loss of bound protein, resulting in very low (<0.1%) nonspecific binding and a highly pure protein.
- **Easily Scalable:** Scale up and down, important for obtaining mg-plus quantities.
- **Optimized for Mammalian Protein Expression:** The HaloTag® platform allows flexibility to move between purification, pull-downs and cellular imaging with a single construct.

Storage Conditions: Store the Spin Columns at room temperature. Store the HaloLink™ Resin at 4°C. Store the HaloTEV Protease, HaloTag® TMRDirect™ Ligand and powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.



Schematic of the HaloTag® Mammalian Protein Purification System protocol. Streamlined purification process leads to higher purity and recovery of recombinant proteins from cultured cells.

HaloTag® Protein Purification System

Product	Size	Cat.#
HaloTag® Protein Purification System	1 each	G6280
HaloTag® Protein Purification System Sample Pack	1 each	G6270
Available Separately	**Size**	**Cat.#**
Single Step (KRX) Competent Cells	20 × 50 µl	L3002
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Protein Purification System is designed to purify proteins fused to HaloTag®, a novel protein tag that enhances the expression and solubility of recombinant proteins. HaloTag® Technology enables the covalent, efficient and specific capture of a protein of interest onto HaloLink™ Resin, thus overcoming the equilibrium-based limitations associated with affinity tags (i.e., poor capture of proteins expressed at low levels and protein loss during washing of the purification resin.

The HaloTag® technology offers a quick and convenient way to test protein expression of HaloTag® fusion proteins as well as monitor the efficiency of immobilization to HaloLink™ Resin by labeling with fluorescent HaloTag® TMR Ligand followed by SDS-PAGE analysis. Guidelines can be found in the *HaloLink™ Resin Technical Manual* #TM250, the *HaloLink™ Protein Array Technical Manual* #TM310 and the *HaloCHIP™ System Technical Manual* #TM075.

Outline of Procedure

The HaloTag® protein, a 34kDa mutated hydrolase, covalently attaches to HaloLink™ Resin via an immobilized chloroalkane ligand. TEV Protease cleaves the target protein from the HaloLink™ Resin. The TEV Protease, which has an N-terminal (HQ) tag, is removed from the protein of interest using HisLink™ Resin, and the purified protein of interest is recovered. The appropriate vector that encodes the HaloTag® protein and expresses protein optimally in *E. coli* is pFN18A HaloTag® T7 Flexi® Vector (G2751) or pFN18K HaloTag® T7 Flexi® Vector (G2681). These vectors can be purchased separately.

Features:

- **Experience Superior Yield, Purity and Specific Activity of Soluble, Functional Proteins Compared to His-Tag, GST and MBP Affinity Tags:** Specific and covalent HaloTag® fusion protein capture and immobilization on HaloLink™ Resin.
- **Achieve Enhanced Target Protein Expression in Prokaryotic, Mammalian and Cell-Free Systems:** Proteins are expressed as HaloTag® fusion proteins.
- **Purify Poorly Expressed Fusion Proteins:** Rapid, specific and covalent capture of HaloTag® protein onto HaloLink™ Resin is a nonequilibrium process.
- **Efficiently Recover Tag-Free Target Protein using TEV Protease Cleavage:** Optimized TEV protease recognition site within the interconnecting polypeptide separating the HaloTag® protein and the fusion partner. HaloTag® protein remains immobilized on the resin due to covalent capture.
- **Save Time:** One buffer compatible with downstream applications for all purification steps.
- **Perform Easy In-Gel Detection and Quantification of Protein Expression Levels with Fluorescent HaloTag® Ligands:** Highly stable HaloTag® protein-ligand interaction permits boiling with SDS sample buffer followed by resolving on SDS-PAGE.

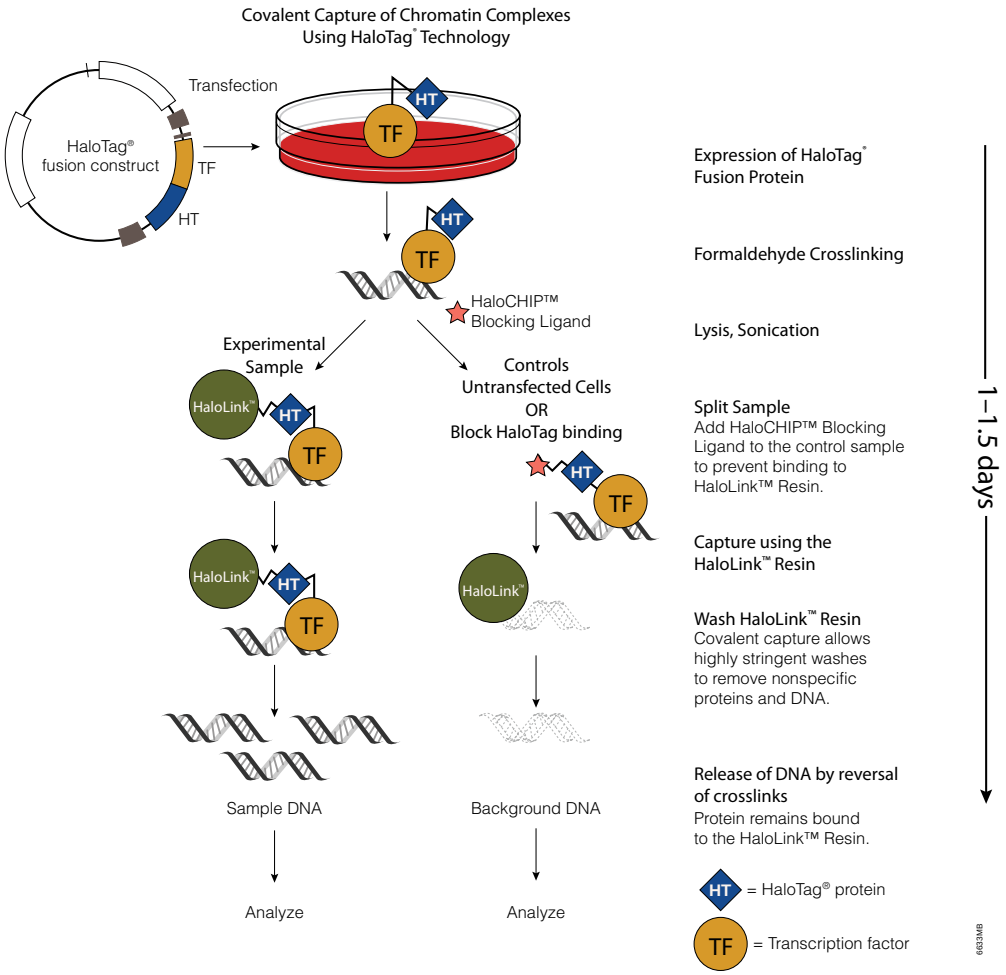
Storage Conditions: Store the HaloLink™ Resin and HisLink™ Resin at 4°C. Do not freeze the resins. Store the TEV Protease at –20°C.

Available in the Helix® on-site stocking system

Protein:Protein Interactions

Product	Size	Cat.#
HaloCHIP™ System	20 reactions	G9410
HaloLink™ Array Six Slide System	6 slides	G6190
HaloTag® Standard Protein	30 µg	G4491
Protein G HaloTag® Fusion Protein	5 mg	G7291
HaloTag® Complete Pull-Down System	1 each	G6509
HaloTag® Mammalian Pull-Down and Labeling System	24 reactions	G6500
HaloTag® Mammalian Pull-Down System	24 reactions	G6504
HaloTag® Control Vector	20 µg	G6591
Available Separately	**Size**	**Cat.#**
Protease Inhibitor Cocktail, 50X	1 ml	G6521
Mammalian Lysis Buffer	40 ml	G9381
MagneGST™ Pull-Down System	80 reactions	V8870
For Research Use Only. Not for Use in Diagnostic Procedures.		

See pages 283-286 for more information.



Schematic diagram of the HaloCHIP™ System.

Promega

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10 Genetic Identity

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Sample Preparation for Genetic Identity

SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent

Product	Size	Cat.#
SwabSolution™ Kit	100 preps	DC8271
PunchSolution™ Kit	100 preps	DC9271
5X AmpSolution™ Reagent	100 preps	DM1231
Not For Medical Diagnostic Use.		

Description: The SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent allow fast and simple processing of swabs and punches for PowerPlex® System analysis. These products are intended for preparation of single-source reference, database and paternity samples where DNA purification is unnecessary.

The **SwabSolution™ Kit** is used for rapid processing of swabs for STR analysis using PowerPlex® Systems. The SwabSolution™ Kit contains SwabSolution™ Reagent, which is used to generate a buccal swab extract that is added to the PowerPlex® System reaction. In addition, the SwabSolution™ Kit contains the 5X AmpSolution™ Reagent, which enables direct amplification from swabs with PowerPlex® Systems that were not originally designed for direct amplification.

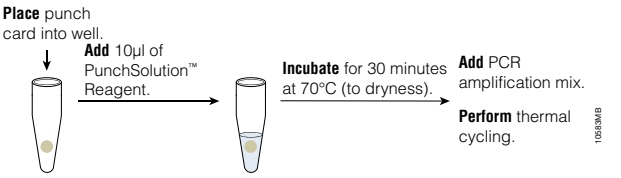
The **PunchSolution™ Kit** is used for rapid processing of punches from nonFTA storage cards (S&S 903, Bode Buccal Collector™ device, etc.) for STR analysis using PowerPlex® Systems. The PunchSolution™ Kit contains PunchSolution™ Reagent, which is used to pretreat nonFTA punches prior to adding the PowerPlex® PCR amplification mix. In addition, the PunchSolution™ Kit contains the 5X AmpSolution™ Reagent, which enables direct amplification from punches with PowerPlex® Systems that were not originally designed for direct amplification.

The **5X AmpSolution™ Reagent** allows direct amplification of unwashed FTA® punches in most PowerPlex® Systems that were not originally designed for direct amplification. Additionally, the AmpSolution™ Reagent allows use of the SwabSolution™ and PunchSolution™ Kits with more PowerPlex® Systems. The AmpSolution™ Reagent is simply added to the PowerPlex® PCR amplification mix. See the supported PowerPlex® Systems at: **www.promega.com/directamp/**

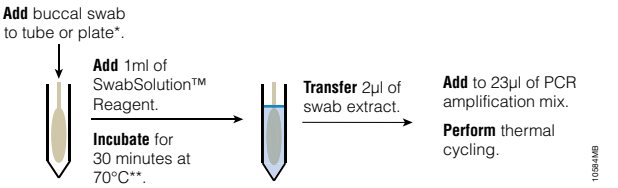
Features:

- Rapid, simple preparation methods for swabs and punches can save 2–4 hours per plate of samples.
- Compatibility with most PowerPlex® Systems increases the speed and versatility of the PowerPlex® Systems.

Storage Conditions: Upon receipt of kit, thaw and mix as per the instructions and store at 4°C.



PunchSolution™ Kit nonFTA punch workflow. For reactions other than PowerPlex® 18D and PowerPlex® 21, add AmpSolution™ Reagent. For more information, please visit: **www.promega.com/directamp/**



SwabSolution™ Kit buccal swab workflow. *For plate format, use 2.2ml, Square-Well Deep Well Plate (Cat.# V6781). **Use Heat Block Adapter (Cat.# A2661), with the heat set at 90°C. For reactions other than PowerPlex® 18D and PowerPlex® 21, add AmpSolution™ Reagent. For more information, please visit: **www.promega.com/directamp**/

DNA IQ™ System

Product	Size	Cat.#
DNA IQ™ System	100 reactions	DC6701
	400 reactions	DC6700
Casework Extraction Kit	100 reactions	DC6745
Tissue and Hair Extraction Kit (for use with DNA IQ™)	100 reactions	DC6740
Available Separately	**Size**	**Cat.#**
Lysis Buffer	150 ml	A8261
2X Wash Buffer	70 ml	A8271
Elution Buffer	50 ml	A8281
DNA IQ™ Resin	50 ml	A8251
DNA IQ™ Spin Baskets	1,000 /bag	V1221
Proteinase K	100 mg	V3021
DTT, Molecular Grade (Dry Powder)	5 g	V3151
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

A8261, A8271, A8281, DC6745, A8251, V1221 Not For Medical Diagnostic Use. DC6701, DC6700, DC6740, V3021, V3151, V4741 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA IQ™ System is a DNA isolation system designed specifically for forensic and paternity laboratories. This system employs novel paramagnetic particles to isolate clean DNA for use with short tandem repeat (STR) analysis. The DNA IQ™ System can be used to extract DNA from a variety of sample types, including stains and liquid samples. Protocols for database samples and casework samples are available.

The unique DNA IQ™ Resin removes PCR inhibitors and contaminants frequently encountered in casework samples. When working with larger sample volumes, such as those found in paternity and databasing, the DNA IQ™ System can deliver a consistent amount of total DNA. Samples including buccal swabs, liquid blood and stains on FTA® and other blood cards have been used with the DNA IQ™ System. More information about sample types that have been used with this product is available at: **www.promega.com/products/pm/genetic-identity/dna-iq/dna-iq-sample-types-examined/**

Some samples, such as tissue and hair, require pretreatment with proteinase K. In addition, extracting DNA can be difficult from substrates such as denim, envelopes and carpet. The Tissue and Hair Extraction Kit increases DNA yield from challenging casework samples and substrates. The kit uses Proteinase K and other reagents to remove proteins and other components from DNA, helping to ensure maximal yield and recovery of DNA from casework samples. The DNA then can be purified using the DNA IQ™ System.

The DNA IQ™ System has been tested with the Plexor® HY System and PowerPlex® Systems to ensure a streamlined process. This translates into reliable products that give optimal results from isolation to quantitation and STR analysis.

Genomic DNA isolation using the DNA IQ™ System has been automated on the Biomek® 2000 and 3000 laboratory automation workstations, as well as the Tecan Freedom EVO® liquid handler. Please contact Promega Technical Services for additional information.

Features:

- **Rapid:** Only a few quick steps to obtain clean DNA with fewer PCR inhibitors.
- **Flexible:** One simple system for use with casework, paternity and database samples.
- **Efficient:** Sensitive to minute sample sizes. In addition, no harmful organic solvents such as phenol and chloroform are used, so use of a hood is not required and disposal of hazardous chemicals is eliminated.

Storage Conditions: Store the DNA IQ™ System at 22–25°C. Store the Tissue and Hair Extraction Kit (for use with DNA IQ™) at –20°C. Store the Casework Extraction Kit at 15–30°C.

Differex™ System

Product	Size	Cat.#
Differex™ System	50 samples	DC6801
	200 samples	DC6800
Manual Differex™ Magnet	1 each	V1591
Available Separately	**Size**	**Cat.#**
Differex™ Digestion Buffer	150 ml	A8501
Differex™ Separation Solution	40 ml	A8511
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

A8501, DC6801, A8511, DC6800 Not For Medical Diagnostic Use. V1591, V4741 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Differex™ System extracts DNA from sexual assault samples easily and quickly. The system provides a simple and fast method for separating male and female fractions of a sample, making it possible to analyze samples more quickly and efficiently.

The Differex™ System offers recovery similar to that of the standard method commonly used for differential extraction. The Differex™ System is used in combination with the DNA IQ™ System and Slicprep™ 96 Device on robotic platforms to process up to 48 differential extractions in less than 5 hours, including incubation time, and less than 1 hour of hands-on time.

Automated Differex™ System methods are available for the Biomek® 2000 and 3000 laboratory automation workstations, as well as the Tecan Freedom EVO® liquid handler. Please contact Promega Technical Services for additional information. A manual protocol for the Differex™ System is available for laboratories not yet using robotic platforms for DNA extraction.

Features:

- **Automated Differential Extractions:** The Differex™ System is the first and only system that allows a forensic laboratory to automate every step of differential extraction.
- **Direct Compatibility with the DNA IQ™ System and Downstream STR Applications:** Clean DNA extracts mean you can be confident in your ability to obtain results regardless of your choice of STR systems.
- **Robust Results With Even Tough Samples:** The Differex™ System works with challenging new and old samples typical of those from sexual assaults.
- **More Information About Automated Differex™ System:** See the Automated Differex™ System page at: **www.promega.com/products/pm/genetic-identity/automated-differex/**

Storage Conditions: Store at room temperature.

Manual Differex™ Magnet.

Available in the Helix® on-site stocking system

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Maxwell® 16 Forensic Instrument

Product	Size	Cat.#
Maxwell® 16 Forensic Instrument	1 each	AS3060
Available Separately	**Size**	**Cat.#**
Maxwell® 16 SEV Hardware Kit	1 each	AS1200
Maxwell® 16 Cartridge Rack	1 each	AS1201
Maxwell® 16 Magnetic Elution Rack	1 each	AS1202
Maxwell® 16 LEV Hardware Kit	1 each	AS1250
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Maxwell® 16 LEV Magnet	1 each	AS1261
Thermal Serial Printer and Universal Power Cable	1 each	E2821
UV Bulb, Maxwell® 16	1 each	SP1080

AS1200, AS1201, AS1202, AS1250, AS1251, AS1261, E2821, SP1080 For Research Use Only. Not for Use in Diagnostic Procedures. AS3060 Not For Medical Diagnostic Use. AS1150 For Laboratory Use.

Description: The Maxwell® 16 Forensic Instrument provides easy-to-use, consistent and reliable automated nucleic acid extraction of one to 16 samples, bar-code sample tracking, a touch-screen interface and UV decontamination. The AS3060 instrument packages include the bar-code reader, UV light and Maxwell® Sample Track Software. You choose either low elution volume (50–100µl, LEV) or standard elution volume (300–400µl, SEV) format. Run report data can be transferred from the Maxwell® 16 Forensic Instrument to a PC or an external printer. Data transferred to a PC can be uploaded to a laboratory information management system (LIMS). The Maxwell® 16 Forensic Instrument is labeled as General Purpose Laboratory Equipment (GPLE) in the USA. For the rest of the world, it is intended for research use only.

Features:

- **Fast, Hands-Free Purification:** Improves workflow, and allows staff to perform other value-added tasks.
- **Consistent, Reliable Performance:** Results in less rework and more confidence in results.
- **Ease of Use:** Yields immediate productivity gains with minimal operator training.
- **Small Size:** Takes up less room on the lab bench. Fits inside biosafety cabinet or hood.
- **Bar-Code Sample Tracking Capability:** Eliminates sample mixup, and data can be integrated into LIMS.
- **UV Light:** Helps decontamination.

Storage Conditions: Store at 15–40°C.

Maxwell® 16 Forensic Instrument.

DNA IQ™ Reference Sample Kit for Maxwell® 16

Product	Size	Cat.#
DNA IQ™ Reference Sample Kit for Maxwell® 16	48 preps	AS1040
Available Separately	**Size**	**Cat.#**
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA IQ™ Reference Sample Kit for Maxwell® 16 is designed specifically for optimal DNA extraction from buccal swabs, FTA® blood card punches, liquid blood or other high-concentration DNA reference samples. These samples are typically encountered in forensic, convicted-offender database and paternity testing. The kit contains the same trusted reagents used in the DNA IQ™ System in a convenient prepackaged format and is optimized to yield a final DNA concentration that minimizes the need for concentration or dilution prior to amplification. Liquefied samples are placed directly into the cartridges, and genomic DNA ready for amplification is obtained in approximately 20 minutes.

The Maxwell® 16 Instrument allows efficient, automated DNA purification from a wide range of sample types. The instrument is preprogrammed with purification protocols that, when combined with prefilled reagent cartridges, maximize simplicity and convenience. The instrument processes up to 16 samples per instrument run. The purified DNA is of high quality and at high yield and concentration, suitable for direct use in a variety of downstream applications. The Maxwell® 16 Instrument, a magnetic-particle-handling device, purifies DNA using paramagnetic particles, allowing optimal capture, washing and elution of the target material.

The Maxwell® 16 Instrument includes a one-year basic warranty. Several products are offered to extend the warranty. If during the extended warranty period the instrument needs repair under normal use, Promega will be responsible for the repair. Premium warranties offer similar terms and the use of a temporary replacement instrument during the instrument repair period. Please contact Promega for complete warranty terms and limits.

Features:

- **Maximize Your Time:** Automating DNA extraction reduces hands-on bench time spent manually extracting DNA.
- **Gain Confidence in Your Results:** Instrument design, optimized reagents and automated methods provide consistent yield and purity.
- **Use Trusted DNA IQ™ Chemistry:** The DNA IQ™ System is the recognized leader in automated DNA extraction chemistries and is included in the prefilled Maxwell® 16 reagent cartridges.

Storage Conditions: Store at 22–25°C.

DNA IQ™ Casework Pro Kit for Maxwell® 16

Product	Size	Cat.#
DNA IQ™ Casework Pro Kit for Maxwell® 16	48 preps	AS1240
Available Separately	**Size**	**Cat.#**
Casework Extraction Kit	100 reactions	DC6745
LEV Plungers	50 /pk	AS6151
Elution Tubes	50 /pk	AS6201
ClickFit Microtube, 1.5ml	1,000 /pack	V4741

AS1240, DC6745 Not For Medical Diagnostic Use. AS6151, AS6201, V4741 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The DNA IQ™ Casework Pro Kit for Maxwell® 16 includes newly designed plungers and optimized preprocessing, which results in improved DNA yields.

The DNA IQ™ Casework Pro Kit for Maxwell® 16 is designed for optimal DNA extraction from forensic casework samples. These samples may include blood stains, semen stains, hairs, cigarette butts, tissue samples, and trace or "touch" DNA samples regularly encountered in forensic DNA analysis. The kit contains the same trusted reagents used in the DNA IQ™ System in a convenient, prefilled cartridge format and is optimized to provide a final DNA extract in a concentrated format.

The DNA IQ™ Casework Pro Kit for Maxwell® 16 uses a plastic cartridge and plunger that allow DNA elution in a final volume of no more than 50µl. DNA IQ™ Lysis Buffer, Resin and Wash Buffer are included in the prefilled cartridge, and DNA IQ™ Elution Buffer is included in the kit to ensure proper storage of the DNA. The DNA IQ™ Casework Pro Kit is compatible with the Maxwell® 16 Forensic Instrument, which includes the hardware necessary to use this kit.

The Casework Extraction Kit improves DNA extraction efficiency from a broad panel of sample types and is used for preprocessing samples before DNA extraction with the DNA IQ™ Casework Pro Kit for Maxwell® 16.

Features:

- **Reduced Elution Volumes:** Elute your sample in less than 50µl of DNA IQ™ Elution Buffer. No need for post-purification concentration steps.
- **Confidence in Your Chemistry:** The DNA IQ™ System is the recognized leader in automated DNA extraction chemistries and is included in the prefilled Maxwell® 16 reagent cartridges.
- **Preprogrammed Methods:** There is no need for programming or an external computer. The Maxwell® 16 Instrument comes preloaded with all of the necessary methods, which are optimized for maximum performance.

Storage Conditions: Store at 15–30°C.

Genetic Identity Automation Hardware and Software

Product	Size	Cat.#
Shaker Integration Plate	1 each	V3691
Deep Well Heat Transfer Block	1 each	V6741
VARIOMAG® Teleshake (110V, for North America use only)	1 each	V6751
V&P Scientific Heating Block (110V, North America use only)	1 each	V6761
1.2ml, Round-Bottom Deep Well Plate	50 /case	V6771
2.2ml, Square-Well Deep Well Plate	50 /case	V6781
Pyramid-Bottom Reservoir, 12 Column	25 /case	V6791
Pyramid-Bottom Reservoir	25 /case	V6801
U-Bottom Microplate	50 /case	V6811
1.1ml, Square-Well, V-Bottom Deep Well Plate	25 /case	V6821
10ml, 24-Well Deep Well Plate	25 /case	V6831
Four-Position Tube Holder	1 each	V1601
STR Normalization Manager™	3 CD-ROM	DG1820

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Genetic Identity Automation Hardware and Software can be used on automated platforms in conjunction with Promega Genetic Identity products. Please contact Technical Services for specific application and platform information.

Slicprep™ 96 Device

Product	Size	Cat.#
Slicprep™ 96 Device	10 pack	V1391

For Laboratory Use.

Description: The Slicprep™ 96 Device allows solid material to be incubated with a solution in a basket that is placed in a deep-well plate. Following incubation, the basket is raised with a collar for an additional 0.5ml of space below the basket. This allows removal of the incubation liquid and solubilized material from the solid support without having to transfer material to another tube or plate. One-millimeter holes in the bottom of the basket allow rapid flow of liquid in and out of the baskets. The device is manufactured with polypropylene to reduce adsorption of biological material onto the plastic and give it strength and stability over a wide temperature range. The components are manufactured and assembled in a HEPA-filtered clean room with gloved and gowned personnel to reduce the chance of DNA contamination.

The package contains 10 units of the Slicprep™ 96 Device. Each unit consists of three components: the 96 Spin Basket, 96 Deep Well Plate and U-Shaped Collar, which is used to raise the baskets during centrifugation.

Storage Conditions: Store at 22–25°C.

Available in the Helix® on-site stocking system

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DNA Quantitation for Genetic Identity

Plexor® HY System

Product	Size	Cat.#
Plexor® HY System	200 reactions	DC1001
	800 reactions	DC1000
Available Separately	**Size**	**Cat.#**
Plexor® Calibration Kit, Set A	1 each	DC1500
Water, Amplification Grade	6,250 µl	DW0991
Not For Medical Diagnostic Use.		

Description: The Plexor® HY System is a real-time PCR assay to determine the concentration of total human DNA and male human DNA simultaneously in one reaction. The kit contains an internal PCR control (IPC) to test for false-negative results that may occur in the presence of PCR inhibitors and a melt curve function to confirm that the correct product was amplified.

The Plexor® HY System is a sensitive multiplex kit that routinely detects approximately 6.4pg of total DNA. PCR setup is performed at room temperature and is compatible with automated platforms.

The Plexor® Systems work by measuring a reduction in fluorescent signal during amplification. Amplification of each target uses only two primers, one of which contains both a fluorescent tag and a modified base. As amplification proceeds, fluorescence is reduced by site-specific incorporation of a fluorescent quencher opposite the complementary modified base. The quencher is in close proximity to a fluorescent dye located on the end of the primer, resulting in a reduction of fluorescent signal. After PCR, a melt analysis can be performed to provide an internal control for the final assay design or to expedite troubleshooting.

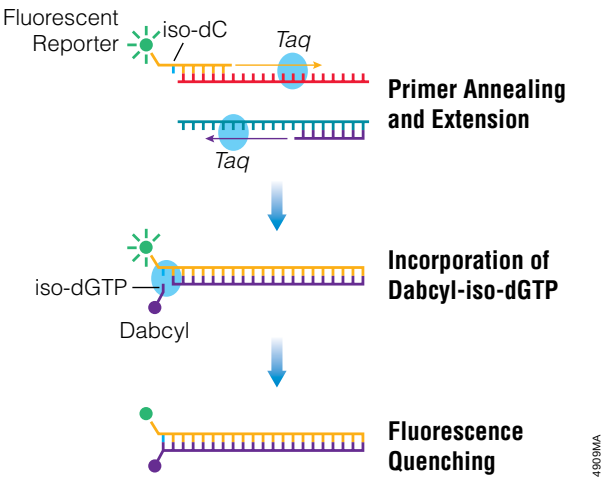
The Plexor® HY System is optimized for use on the Applied Biosystems 7500 and 7500 FAST real-time PCR systems and Stratagene Mx3005P® and Mx3000P® qPCR systems. For information about use with other qPCR instrumentation, contact Promega Technical Services.

The Plexor® Analysis Software is available for free download. The unique functions of this software allow you to quickly and easily review data and create reports. Replicate samples are automatically averaged, template amounts are calculated and the necessary volume of DNA is displayed for your optimized STR amplification conditions.

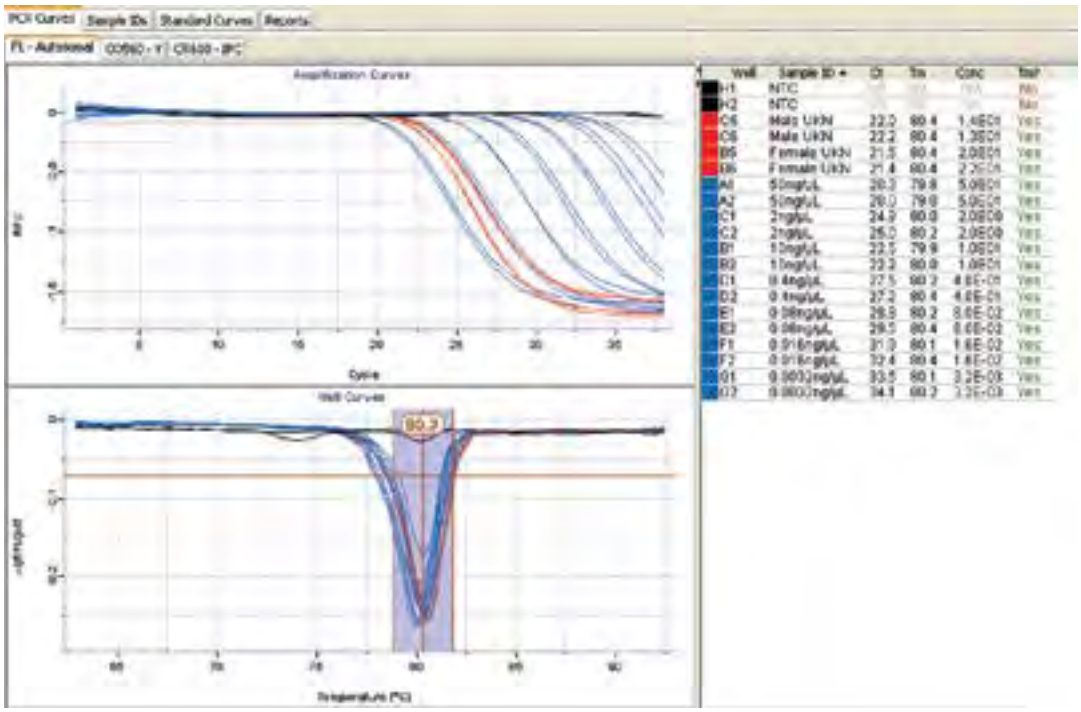
Features:

- **Simultaneous Quantification of Autosomal and Y-Chromosome DNA:** Less variability, less time, more valuable data.
- **Consistent and Reproducible Detection of 6.4pg of DNA:** If you can't detect it with Plexor® HY, you can't detect it with your STR system.
- **Internal Positive Control and Melt-Curve Analysis:** Guard against false-negative and false-positive results, allowing you to be confident in your data.

Storage Conditions: Store at –20°C.



Schematic diagram illustrating the Plexor® real-time PCR process.



Autosomal amplification curves and melt curves from a Plexor® HY amplification.

STR Analysis for Forensic and Paternity Testing

PowerPlex® ESX and ESI Fast Systems

Product	Size	Cat.#
PowerPlex® ESX 16 Fast System	400 reactions	DC1610
	100 reactions	DC1611
PowerPlex® ESI 16 Fast System	400 reactions	DC1620
	100 reactions	DC1621
PowerPlex® ESX/ESI 16 Fast Systems Bundle	400 reactions	DC1630
	100 reactions	DC1631
PowerPlex® ESX 17 Fast System	400 reactions	DC1710
	100 reactions	DC1711
PowerPlex® ESI 17 Fast System	400 reactions	DC1720
	100 reactions	DC1721
PowerPlex® ESX/ESI 17 Fast Systems Bundle	400 reactions each	DC1730
	100 reactions each	DC1731

Available Separately	Size	Conc.	Cat.#
CC5 Internal Lane Standard 500 Pro	300 µl		DG3481
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	500 µl	0.25 ng/µl	DD7251
	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

Description: The PowerPlex® ESX and ESI Fast Systems meet the ENFSI recommendations for DNA profile sharing across Europe and allow co-amplification and detection of D3S1358, D8S1179, D18S51, D21S11, FGA, TH01, vWA, D2S441, D10S1248, D22S1045, D1S1656, D12S391, D2S1338, D16S539, D19S433, SE33 and Amelogenin. Rapid cycling technology enables amplification to be done in less than 50 minutes.

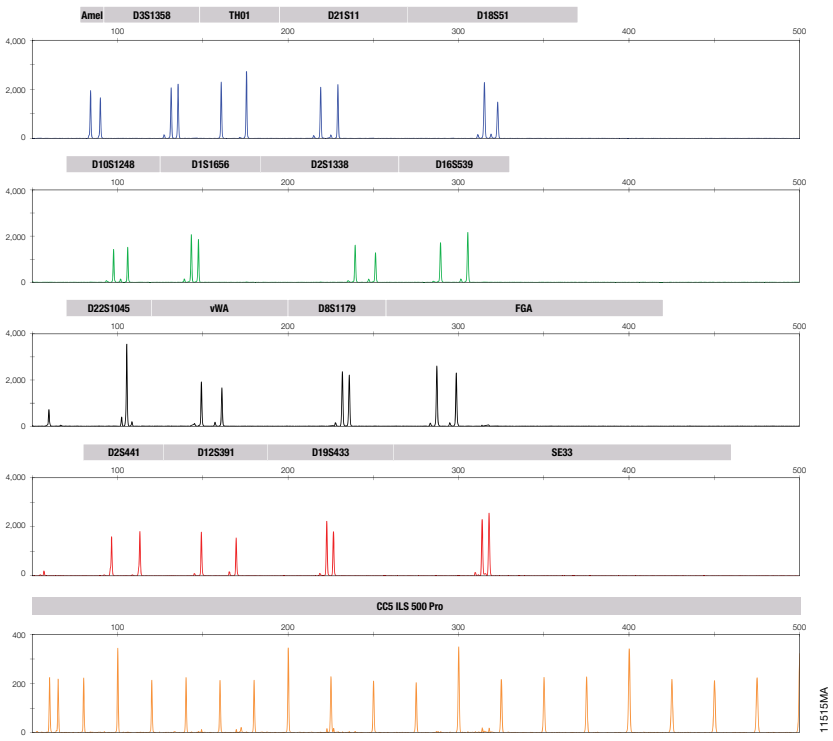
These kits are available in multiple formats, including the option to detect SE33, to accommodate various requirements or preferences. Additionally, the kits have superior tolerance to common inhibitors and superior sensitivity to obtain full profiles from low-level DNA and are robust enough to genotype degraded DNA samples through the use of miniSTR loci.

This system is compatible with ABI PRISM® 310, 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Features:

- **<50-Minute Amplification Time:** Shorter turnaround time to results.
- **Multiple Kit Configurations:** Confirm results from poor-quality samples.
- **ENFSI-Recommended Loci:** Data is more easily shared across borders.
- **MiniSTRs:** Obtain more complete profiles from degraded DNA.
- **Robust Buffer:** Achieve better results with challenging casework samples.
- **One Kit for Databasing and Casework Samples:** Simplified QC and inventory management.

Storage Conditions: Store at –20°C.



The PowerPlex® ESX 17 Fast System. 2800M Control DNA (0.5ng) was amplified with the PowerPlex® ESX 17 Fast System for 30 cycles. Amplification products were separated using an Applied Biosystems® 3130 Genetic Analyzer (3kV, 5-second injection).

Available in the Helix® on-site stocking system

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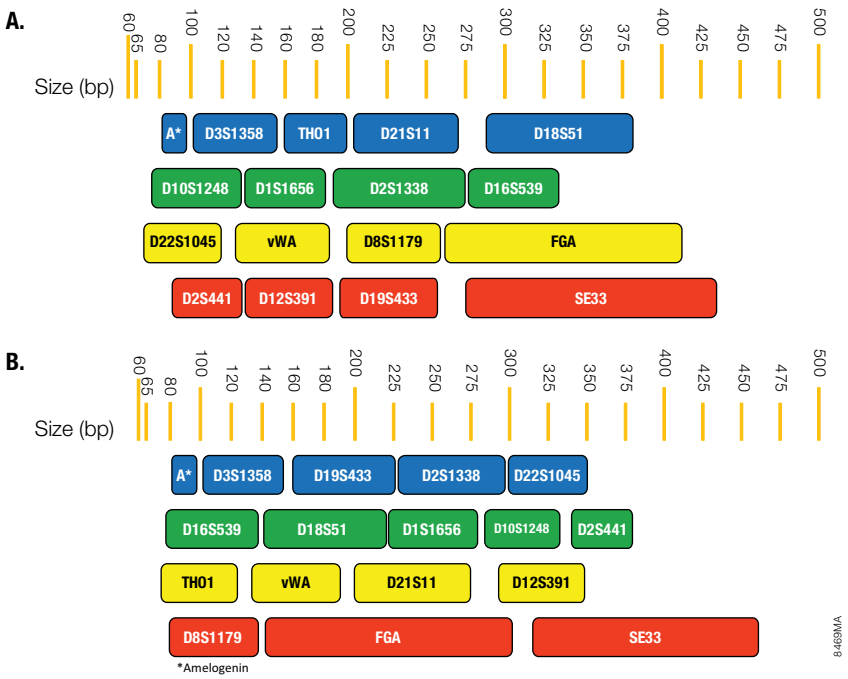


Configurations of PowerPlex® ESX and ESI 17 Fast Systems. **Panel A.** The PowerPlex® ESX 17 Fast System contains the new ENFSI/EDNAP loci as miniSTRs. **Panel B.** The PowerPlex® ESI 17 Fast System contains the new ENFSI/EDNAP loci but focuses on miniaturization of existing ESS loci. (A = Amelogenin). Both configurations are available without SE33.

PowerPlex® Fusion System

Product	Size	Cat.#
PowerPlex® Fusion System	200 reactions	DC2402
	800 reactions	DC2408
Available Separately	**Size**	**Conc.**	**Cat.#**
PowerPlex® 5-Dye Matrix Standards, 3100/3130	25 µl		DG4700
2800M Control DNA	25 µl	10 ng/µl	DD7101
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991

Not For Medical Diagnostic Use.

Description: The PowerPlex® Fusion System is a 24-locus multiplex for human identification applications including forensic analysis, relationship testing and research use. This five-color system allows co-amplification and fluorescent detection of the 13 core CODIS (US) loci (CSF1PO, FGA, TH01, TPOX, vWA, D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51 and D21S11), the 12 core European Standard Set loci (TH01, vWA, FGA, D21S11, D3S1358, D8S1179, D18S51, D10S1248, D22S1045, D2S441, D1S1656 and D12S391) and Amelogenin for gender determination. In addition, the male-specific DYS391 locus is included to identify null Y allele results for Amelogenin. The Penta D, Penta E, D2S1338 and D19S433 loci are included to increase discrimination and allow searching of databases that include profiles with these popular loci. This extended panel of STR markers is intended to satisfy both CODIS and ESS recommendations.

The PowerPlex® Fusion System works well with extracted DNA samples, including low amounts of template DNA, mixtures and inhibitor-laden samples. The PowerPlex® Fusion System also is compatible with direct amplification, enabling streamlined STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches. Fast cycling conditions used with the PowerPlex® Fusion System reduce sample-processing time for all samples.

The PowerPlex® Fusion System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

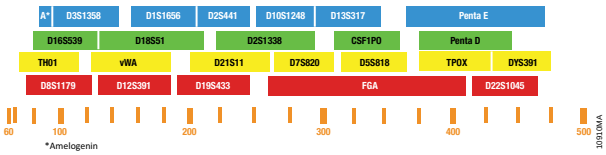
Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

The PowerPlex® Fusion System was given NDIS approval in March 2013 for NDIS CODIS databasing.

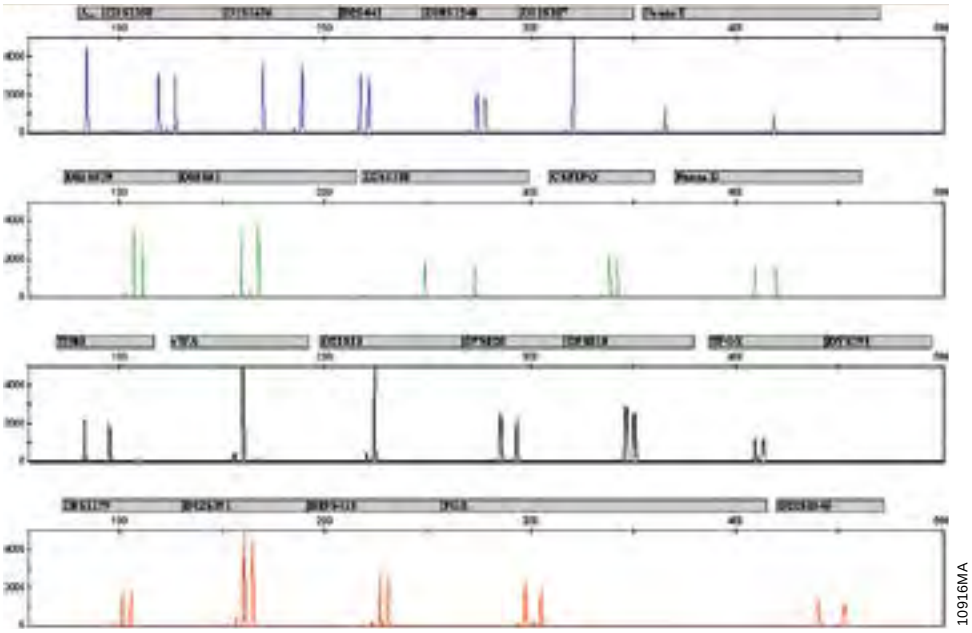
Features:

- **Highest Interdatabase Compatibility and Discrimination:** Twenty-four loci (23 STRs plus Amelogenin), including the CODIS and ESS required loci. Amplifies all loci found in Identifiler®, SGM Plus® and PowerPlex® 16 Systems, some of the most commonly used multiplexes over the last decade.
- **Streamlined Workflows:** Direct-amplification protocols and rapid cycling.
- **Less Repeat Analysis of Difficult Samples:** High inhibitor tolerance and sensitivity for casework.
- **Easier Validation and QC:** One kit for both casework and database sections.

Storage Conditions: Store kit at –20°C. Upon receipt, move 2800M Control DNA to 4°C storage.



The 24 loci included in the PowerPlex® Fusion System. This system includes Amelogenin, D3S1358, D1S1656, D2S441, D10S1248, D13S317 and Penta E labeled with fluorescein; D16S539, D18S51, D2S1338, CSF1PO and Penta D labeled with JOE; TH01, vWA, D21S11, D7S820, D5S818, TPOX and DYS391 labeled with TMR-ET; and D8S1179, D12S391, D19S443, FGA and D22S1045 labeled with CXR-ET. The CC5 Internal Lane Standard 500 (CC5 ILS 500) is labeled with CC5 dye and contains 21 DNA fragments of 60, 65, 80, 100, 120, 140, 160, 180, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475 and 500 bases in length.



Direct amplification of two 1.2mm FTA® card punches from a buccal sample using the protocol described in the *PowerPlex® Fusion System Technical Manual* #TMD039. Amplified products were separated on an Applied Biosystems® 3130*xl* Genetic Analyzer (3kV, 5-second injection).

Available in the Helix® on-site stocking system

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PowerPlex® Y23 System

Product		Size	Cat.#
PowerPlex® Y23 System		50 reactions	DC2305
		200 reactions	DC2320
Available Separately	**Size**	**Conc.**	**Cat.#**
CC5 Internal Lane Standard 500 Y23	300 µl		DG3801
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
Water, Amplification Grade	6,250 µl		DW0991

Not For Medical Diagnostic Use.

Description: The PowerPlex® Y23 System is a 23-loci, 5-color Y-STR multiplex designed for genotyping forensic casework samples, database samples and paternity samples. The kit contains all 12 loci in the current PowerPlex® Y System, the additional 5 loci found in AmpF*l*STR® Y-filer®, plus 6 new loci.

The PowerPlex® Y23 System works well with extracted DNA samples, including low amounts of template and male/female DNA mixtures. The PowerPlex® Y23 System also is compatible with direct amplification, enabling streamlined Y-STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches.

Faster cycling conditions cut amplification time almost in half. Moreover, reduced sample-processing time and faster cycling conditions provide a significant time savings in every run.

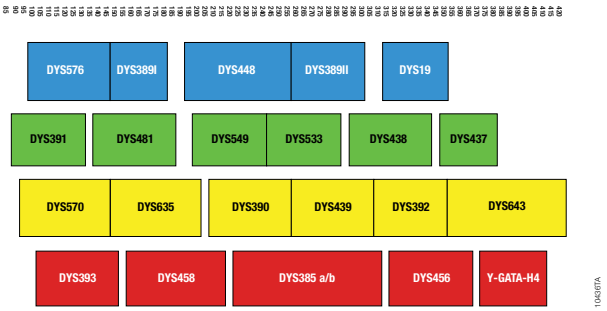
The PowerPlex® Y23 System is tolerant of many known amplification inhibitors. The robust performance of the kit results in more interpretable data from inhibitor-laden samples.

The PowerPlex® Y23 System was given NDIS approval in January 2013 for NDIS CODIS databasing.

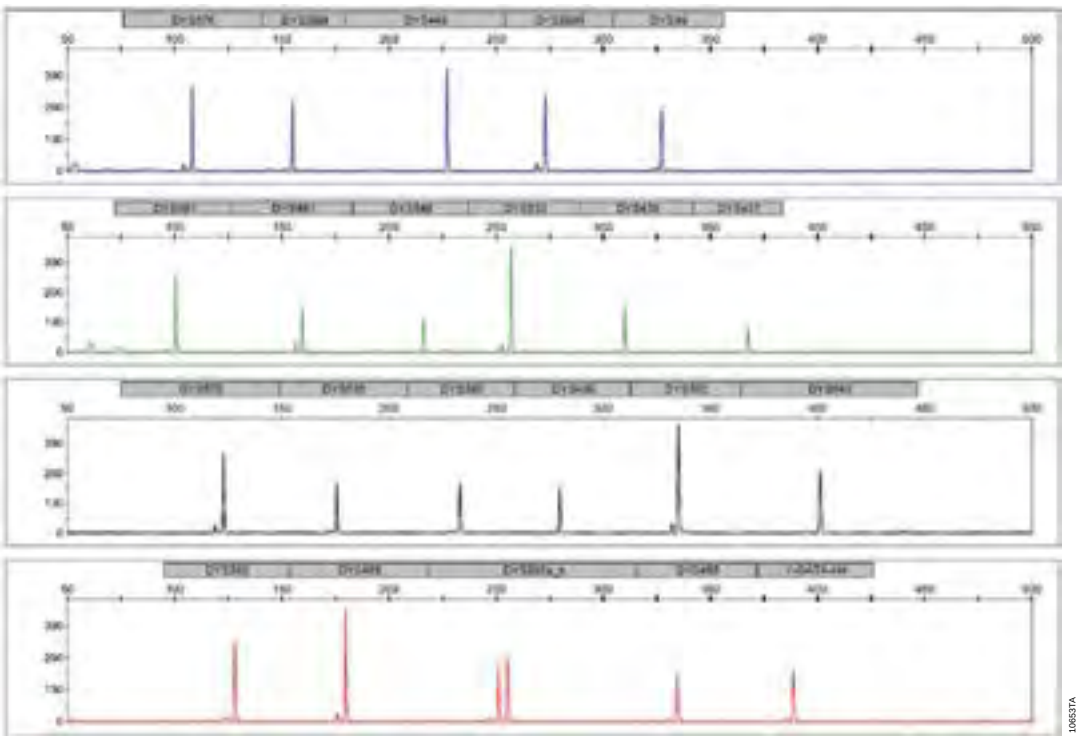
Features:

- **More Meaningful STR Analysis:** Higher power of discrimination from 23 loci results in fewer false-positive matches.
- **More Usable Profile from Samples with Excess Female DNA:** High sensitivity in the presence of female DNA (<0.1ng male DNA, 1:6,000 ratio).
- **Streamlined Databasing Workflows:** Direct-amplification-compatible.
- **Significant Reduction in Amplification Time:** Faster cycling conditions cut amplification time roughly in half.
- **Full Profiles from Challenging Casework Samples:** High tolerance for inhibitors including tannic acid, hematin and humic acid.
- **Simplified Workflows and Inventory:** One kit for both casework and databasing.

Storage Conditions: Upon receipt of kit, remove 2800M Control DNA and store at 4°C. Store all other kit components at –20°C.



The PowerPlex® Y23 System allows co-amplification and four-color detection of 23 male-specific STR loci: DYS576, DYS389I/II, DYS448, DYS19, DYS391, DYS481, DYS549, DYS533, DYS438 (penta), DYS437, DYS570, DYS635, DYS390, DYS439, DYS392, DYS643 (penta), DYS393, DYS458, DYS385a/b, DYS456 and YGATA-H4.



Amplification of 62.5pg of male DNA in the presence of 400ng of female DNA using 30 cycles and the PowerPlex® Y23 System. Amplified products were separated on an Applied Biosystems 3130 Genetic Analyzer (3kV, 5-second injection).

PowerPlex® 21 System

Product	Size	Cat.#
PowerPlex® 21 System	200 reactions	DC8902
	4 × 200 reactions	DC8942
Available Separately	**Size**	**Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251

Not For Medical Diagnostic Use.

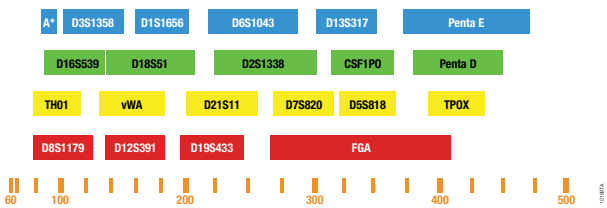
Description: The PowerPlex® 21 System is a multiplex STR system for human identification applications including forensic analysis, relationship testing and research use. The system allows co-amplification and fluorescent detection of 21 loci (20 STR loci and Amelogenin), including D1S1656, D2S1338, D3S1358, D5S818, D6S1043, D7S820, D8S1179, D12S391, D13S317, D16S539, D18S51, D19S433, D21S11, Amelogenin, CSF1PO, FGA, Penta D, Penta E, TH01, TPOX and vWA. The PowerPlex® 21 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Features:

- **21 Markers:** Enjoy maximum discrimination for difficult cases and complete data overlap with most existing multiplexes.
- **Direct-Amplification Compatibility:** Save labor and time by removing the need to wash FTA® card punches. Simpler protocols are available for swabs and nonFTA card punches as well.
- **High Inhibitor Tolerance:** Experience higher success rates with challenging casework samples including less locus drop-out and reaction failure.
- **90-Minute PCR:** Shorten PCR time by 1–2.5 hours, increasing laboratory productivity and decreasing average turnaround time for your cases.

Storage Conditions: Store kit at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.



*Amelogenin

Configuration of the PowerPlex® 21 System. The PowerPlex® 21 System contains all 13 CODIS loci.

Available in the Helix® on-site stocking system

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PowerPlex® 18D System

Product		Size	Cat.#
PowerPlex® 18D System		200 reactions	DC1802
		800 reactions	DC1808
Available Separately	**Size**	**Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

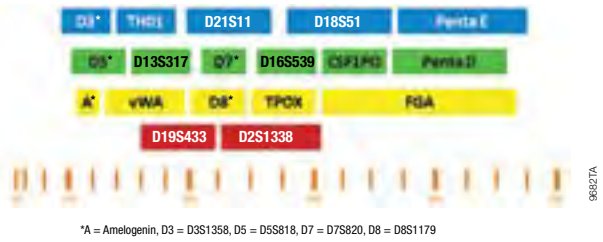
Description: The PowerPlex® 18D System is a multiplex STR system for use in database and paternity testing. This system is optimized for direct amplification of samples on FTA® cards. This five-color multiplex allows co-amplification of the 13 CODIS loci (D18S51, D21S11, TH01, D3S1358, FGA, TPOX, D8S1179, vWA, CSF1PO, D16S539, D7S820, D13S317, D5S818) plus Amelogenin, Penta E, Penta D, D2S1338 and D19S433. All eighteen loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® 18D System is compatible with ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

The PowerPlex® 18D System was given NDIS approval in July 2011 for NDIS CODIS databasing.

Features:

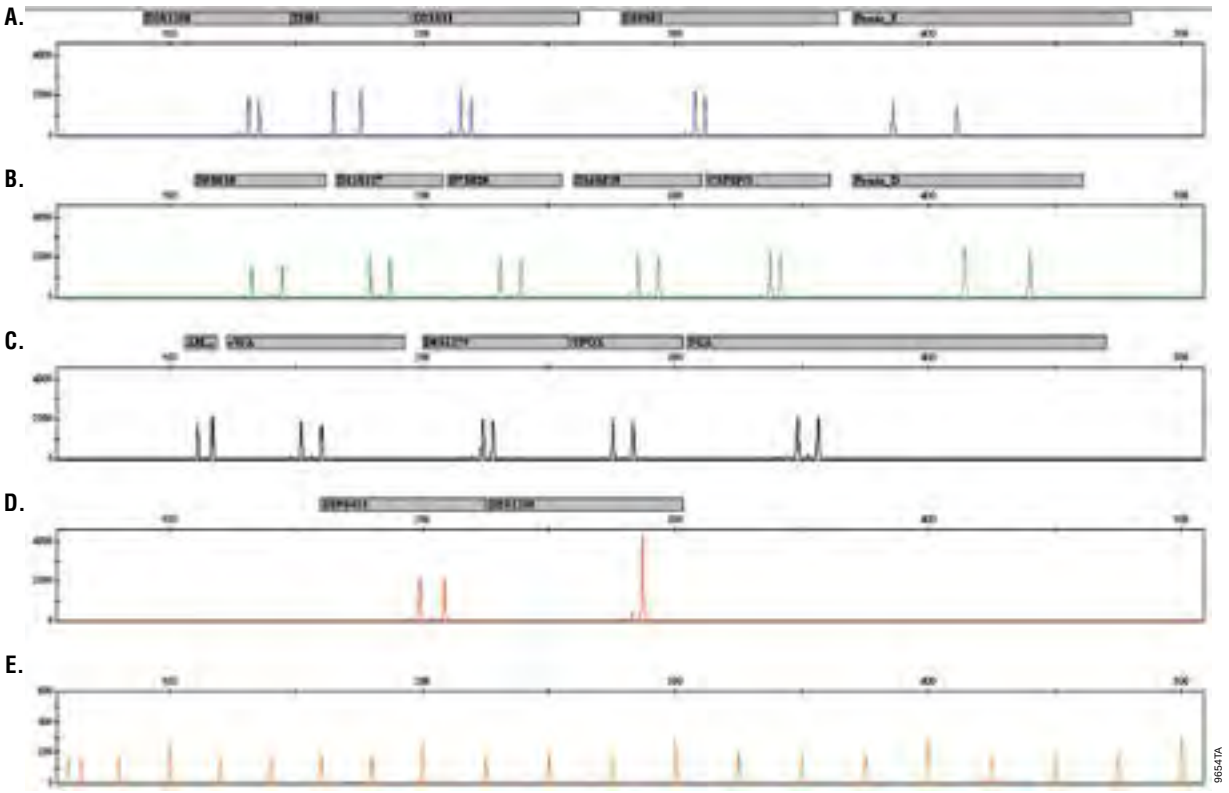
- **Eliminate DNA Extraction:** Simplify and shorten sample processing with direct amplification from FTA® cards.
- **Reduce PCR Time:** Amplify in less than 1.5 hours using rapid cycling technology.
- **Upload More Markers:** Type D2S1338, D19S433, Penta D, Penta E, Amelogenin and the 13 CODIS loci with one kit.
- **Automatically Assign Genotypes:** Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Storage Conditions: Store kit at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.



*A = Amelogenin, D3 = D3S1358, D5 = D5S818, D7 = D7S820, D8 = D8S1179

Configuration of the PowerPlex® 18D System. The PowerPlex® 18D System contains all 13 CODIS loci: D3S1358, TH01, D21S11, D18S51, D5S818, D13S317, D7S820, D16S539, CSF1PO, vWA, D8S1179, TPOX and FGA, plus Amelogenin, Penta E, Penta D, D19S433 and D2S1338.



Amplification of sample using the PowerPlex® 18D System. Two 1.2mm punches were taken from a buccal sample transferred to an FTA® card and amplified for 27 cycles using the PowerPlex® 18D System. Amplification products were mixed with CC5 Internal Lane Standard 500 and analyzed with an Applied Biosystems 3130*xl* Genetic Analyzer using a 3kV, 5-second injection. Results were analyzed using GeneMapper® *ID* software, version 3.2.

PowerPlex® 16 HS System

Product		Size	Cat.#
PowerPlex® 16 HS System		100 reactions	DC2101
		400 reactions	DC2100
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
9947A DNA	250 ng	10 ng/µl	DD1001

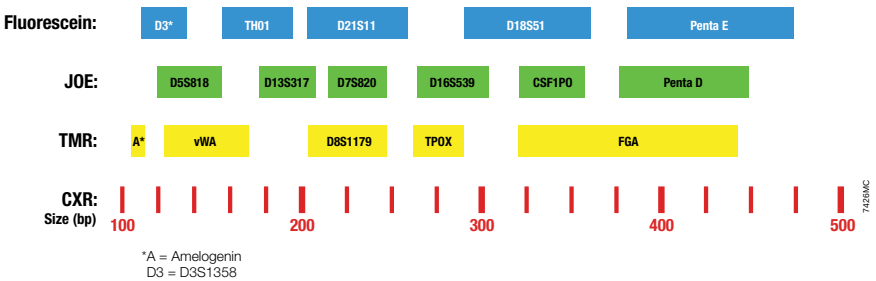
DC2101, DC2100, DW0991, DD7101, DD7251, DD1001 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The PowerPlex® 16 HS System is a multiplex STR system for use in DNA typing. This system co-amplifies the loci D18S51, D21S11, TH01, D3S1358, Penta E (labeled with fluorescein); FGA, TPOX, D8S1179, vWA and Amelogenin (labeled with TMR); CSF1PO, D16S539, D7S820, D13S317, D5S818 and Penta D (labeled with JOE). This multiplex includes all 13 CODIS STR markers, Amelogenin for gender determination and two low-stutter, highly discriminating pentanucleotide STR markers. All sixteen loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® 16 HS System is compatible with ABI PRISM® 310, 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Features:

- **Robustness:** The PowerPlex® 16 HS System is more tolerant of PCR inhibitors than competing STR systems and the previous version of the PowerPlex® 16 System. Generate profiles with samples that previously failed to amplify. Avoid costly and time-consuming sample cleanup.
- **Sensitivity:** Each lot is quality tested to produce full profiles from 100pg of DNA. Gain confidence in analysis of limited samples.
- **High Discrimination:** The loci included in PowerPlex® 16 HS are more discriminating than competitive systems and are ideal for resolving partial matches or challenging familial cases.
- **Proven Design:** Primer sequences, dyes and ladders are all unchanged from PowerPlex® 16. Expect concordance with existing databases.
- **Complete System:** PowerPlex® 16 HS includes size standard, amplification-grade water and *Taq* DNA polymerase already in the master mix. Simple to order, easy to use.
- **Automatic Assignment of Genotypes:** Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Storage Conditions: Store at –20°C.



Configuration of the PowerPlex® 16 HS System. The PowerPlex® 16 HS System contains all 13 CODIS loci.

PowerPlex® CS7 System

Product		Size	Cat.#
PowerPlex® CS7 System		100 reactions	DC6613
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251

DC6613, DW0991, DD7101, DD7251 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The PowerPlex® CS7 System is a multiplex STR assay for relationship testing and human identification. The PowerPlex® CS7 System allows co-amplification and three-color detection of seven STR loci, including LPL, F13B, FESFPS, F13A01, Penta D, Penta C and Penta E. All seven loci are amplified simultaneously in a single tube and analyzed in a single injection. The PowerPlex® CS7 System contains two loci, Penta D and Penta E, that overlap with the loci included in the PowerPlex® 16, 16 HS, 18D, 21 and Fusion Systems. This feature allows the PowerPlex® CS7 System to be used as a confirmatory kit in paternity applications using the five unshared STR loci to supplement the genotype and increase the available information. The PowerPlex® CS7 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers. The PowerPlex® CS7 System provides all materials necessary to amplify STR regions of purified genomic DNA.

Features:

- **More Loci:** Supplement current testing with LPL, F13B, FESFPS, F13A01 and Penta C for greater discrimination.
- **Confirmatory Loci:** Overlap of Penta D and Penta E in the PowerPlex® CS7 and several PowerPlex® Systems allow detection of sample mixup when used together.
- **Complete System:** Hot-start *Taq* DNA polymerase is provided in the master mix, and size standard is included.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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PowerPlex® S5 System

Product	Size	Cat.#
PowerPlex® S5 System	100 reactions	DC6951
	400 reactions	DC6950
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
9947A DNA	250 ng	10 ng/µl	DD1001

DC6951, DC6950, DW0991, DD7101, DD7251, DD1001 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The PowerPlex® S5 System is a miniSTR kit that allows co-amplification and detection of four STR markers (D18S51, D8S1179, TH01 and FGA) plus Amelogenin. One primer specific for each of the Amelogenin, D18S51 and D8S1179 loci is labeled with fluorescein (FL), and one primer specific for each of the TH01 and FGA loci is labeled with 6-carboxy-4´,5´-dichloro-2´,7´-dimethoxy-fluorescein (JOE). All five loci are amplified simultaneously in a single tube and analyzed in a single injection. The four STR loci are included in the CODIS and European databases. The amplicons for all loci are smaller than 260bp. The PowerPlex® S5 System was the first Promega STR kit to include hot-start *Taq* DNA polymerase, which is included in the PowerPlex® S5 5X Master Mix. The PowerPlex® S5 System is primarily a screening tool but also can be used as a miniSTR casework kit.

Features:

- **Sensitive:** Generate full DNA profiles with as little as 50pg of DNA.
- **Easy to Use:** The PowerPlex® S5 System comes complete with premixed primer pairs, a master mix with *Taq* DNA polymerase and internal lane standard. The simplified thermal cycling protocol requires no ramping, and the system is compatible with a number of instrument platforms, including ABI PRISM® 310, 3100 and 3100-*Avant* and Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers.
- **Robust:** The PowerPlex® S5 System is more tolerant of DNA degradation and less sensitive to inhibitors. Full DNA profiles can be achieved in the presence of 130µM hematin, 200ng tannic acid or 150ng humic acid.
- **Automatic Assignment of Genotypes:** Panels and bins text files are required for use with GeneMapper® *ID* software and are available for download. The PowerTyper™ S5 Macro (available separately) facilitates data analysis, allowing automatic assignment of genotypes using the Genotyper® software. The PowerTyper™ Macros can be downloaded.

Storage Conditions: Store at –20°C.

PowerPlex® 16 and ES Monoplex Systems

Product	Size	Cat.#
PowerPlex® 16 Monoplex System, Penta E (Fluorescein)	100 reactions	DC6591
PowerPlex® 16 Monoplex System, Penta D (JOE)	100 reactions	DC6651
PowerPlex® ES Monoplex System, SE33 (JOE)	100 reactions	DC6751
PowerPlex® 16 Monoplex System D3S1358 (Fluorescein)	100 reactions	DC6551
PowerPlex® 16 Monoplex System TH01 (Fluorescein)	100 reactions	DC6561
PowerPlex® 16 Monoplex System D21S11 (Fluorescein)	100 reactions	DC6571
PowerPlex® 16 Monoplex System D18S51 (Fluorescein)	100 reactions	DC6581
PowerPlex® 16 Monoplex System D5S818 (JOE)	100 reactions	DC6601
PowerPlex® 16 Monoplex System D13S317 (JOE)	100 reactions	DC6611
PowerPlex® 16 Monoplex System D7S820 (JOE)	100 reactions	DC6621
PowerPlex® 16 Monoplex System D16S539 (JOE)	100 reactions	DC6631
PowerPlex® 16 Monoplex System CSF1PO (JOE)	100 reactions	DC6641
PowerPlex® 16 Monoplex System vWA (TMR)	100 reactions	DC6661
PowerPlex® 16 Monoplex System D8S1179 (TMR)	100 reactions	DC6671
PowerPlex® 16 Monoplex System TPOX (TMR)	100 reactions	DC6681
PowerPlex® 16 Monoplex System FGA (TMR)	100 reactions	DC6691

Not For Medical Diagnostic Use.

Description: The PowerPlex® 16 and ES Monoplex Systems are available to amplify the Penta E, Penta D, SE33, D3S1358, TH01, D21S11, D18S51, D5S818, D13S317, D7S820, D16S539, CSF1PO, vWA, D8S1179, TPOX or FGA locus. Each monoplex system allows amplification of a single locus to confirm results obtained with the PowerPlex® 16 or discontinued PowerPlex® ES System. The monoplex systems also can be used to re-amplify DNA samples when one or more of the loci do not amplify initially due to suboptimal amplification conditions or poor DNA quality.

The PowerPlex® 16 and PowerPlex® ES Monoplex Systems contain primer pairs that have the same sequence as those used in the PowerPlex® 16 HS (Cat.# DC2100, DC2101), PowerPlex® 16 (Cat.# DC6530, DC6531), PowerPlex® 16 BIO (Cat.# DC6540, DC6541) and discontinued PowerPlex® ES Systems (Cat.# DC6730, DC6731).

Allelic ladders are only provided in the following PowerPlex® Monoplex Systems: DC6751, DC6591 and DC6651 [SE33 (JOE); Penta E (fluorescein) and Penta D (JOE), respectively].

Allelic ladders that are not provided are available by custom order. Please contact Technical Services for allelic ladder options based on the platform used.

The PowerPlex® 16 and ES Monoplex Systems were developed for use with the ABI PRISM® 310, 3100 and 3100-*Avant* and Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers and are compatible with the Hitachi FMBIO® II Fluorescence Imaging System.

Storage Conditions: Store at –20°C. The fluorescent primer pair is light-sensitive; therefore, minimize light exposure.

SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent

Product	Size	Cat.#
SwabSolution™ Kit	100 preps	DC8271
PunchSolution™ Kit	100 preps	DC9271
5X AmpSolution™ Reagent	100 preps	DM1231

Not For Medical Diagnostic Use.

Description: The SwabSolution™ Kit, PunchSolution™ Kit and 5X AmpSolution™ Reagent allow fast and simple processing of swabs and punches for PowerPlex® System analysis. These products are intended for preparation of single-source reference, database and paternity samples where DNA purification is unnecessary.

The **SwabSolution™ Kit** is used for rapid processing of swabs for STR analysis using PowerPlex® Systems. The SwabSolution™ Kit contains SwabSolution™ Reagent, which is used to generate a buccal swab extract that is added to the PowerPlex® System reaction. In addition, the SwabSolution™ Kit contains the 5X AmpSolution™ Reagent, which enables direct amplification from swabs with PowerPlex® Systems that were not originally designed for direct amplification. See the supported PowerPlex® Systems at: **www.promega.com/directamp/**

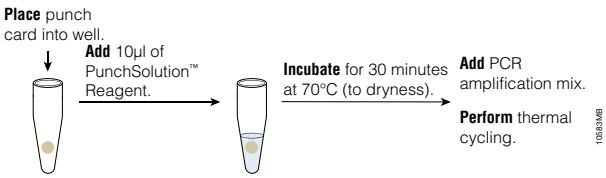
The **PunchSolution™ Kit** is used for rapid processing of punches from nonFTA storage cards (S&S 903, Bode Buccal Collector™ device, etc.) for STR analysis using PowerPlex® Systems. The PunchSolution™ Kit contains PunchSolution™ Reagent, which is used to pretreat nonFTA punches prior to adding the PowerPlex® PCR amplification mix. In addition, the PunchSolution™ Kit contains the 5X AmpSolution™ Reagent, which enables direct amplification from punches with PowerPlex® Systems that were not originally designed for direct amplification. See the supported PowerPlex® Systems at: **www.promega.com/directamp/**

The **5X AmpSolution™ Reagent** allows direct amplification of unwashed FTA® punches in most PowerPlex® Systems that were not originally designed for direct amplification. Additionally, the AmpSolution™ Reagent allows use of the SwabSolution™ and PunchSolution™ Kits with more PowerPlex® Systems (5X AmpSolution™ Reagent is included in the SwabSolution™ and PunchSolution™ Kits). The AmpSolution™ Reagent is simply added to the PowerPlex® PCR amplification mix. See the supported PowerPlex® Systems at: **www.promega.com/directamp/**

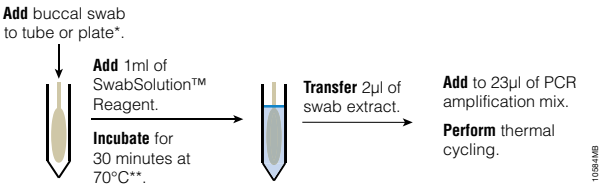
Features:

- Rapid, simple preparation methods for swabs and punches can save 2–4 hours per plate of samples.
- Compatibility with most PowerPlex® Systems increases the speed and versatility of the PowerPlex® Systems.

Storage Conditions: Upon receipt of kit, thaw and mix as per instructions and store at 4°C.



PunchSolution™ Kit nonFTA punch workflow. For reactions other than PowerPlex® 18D and PowerPlex® 21, add AmpSolution™ Reagent. For more information, please visit: **www.promega.com/directamp**



SwabSolution™ Kit buccal swab workflow. *For plate format, use 2.2ml, Square-Well Deep Well Plate (Cat.# V6781). **Use Heat Block Adapter (Cat.# A2661), with the heat set at 90°C. For reactions other than PowerPlex® 18D and PowerPlex® 21, add AmpSolution™ Reagent. For more information, please visit: **www.promega.com/directamp**

PowerPlex® 5-Dye Matrix Standards

Product	Size	Cat.#
PowerPlex® 5-Dye Matrix Standards, 310	50 µl	DG4600
PowerPlex® 5-Dye Matrix Standards, 3100/3130	25 µl	DG4700

Not For Medical Diagnostic Use.

Description: The PowerPlex® 5-Dye Matrix Standards allow the PowerPlex® ESX, ESI, 18D, 21, Y23 and Fusion Systems to be analyzed on the ABI PRISM® 310 Genetic Analyzer (Cat.# DG4600) and ABI PRISM® 3100 and 3100-*Avant* or Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers (Cat.# DG4700).

Proper generation of a spectral calibration file is critical to evaluate multicolor systems. The PowerPlex® 5-Dye Matrix Standards contain matrix fragments labeled with five fluorescent dyes: Fluorescein, JOE, TMR-ET, CXR-ET and CC5. Once generated, the spectral calibration file is applied during collection of PowerPlex® data to calculate and compensate for spectral overlap between different fluorescent dye colors.

Storage Conditions: Store at –20°C. The matrix standards are light-sensitive; therefore, minimize light exposure.

Available in the Helix® on-site stocking system

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PowerPlex® 4-Dye Matrix Standards

Product	Size	Cat.#
PowerPlex® Matrix Standards, 310	50 µl	DG4640
PowerPlex® Matrix Standards, 3100/3130	25 µl	DG4650
Not For Medical Diagnostic Use.		

Description: The PowerPlex® 4-Dye Matrix Standards allow the PowerPlex® 16, PowerPlex® 16 HS, PowerPlex® ES, PowerPlex® S5, PowerPlex® Y, PowerPlex® CS7 and PowerPlex® 16 and ES Monoplex Systems to be analyzed on the ABI PRISM® 310 Genetic Analyzer or ABI PRISM® 377 DNA Sequencer (Cat.# DG4640) and the ABI PRISM® 3100 and 3100-*Avant* or Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers (Cat.# DG4650).

Proper generation of a spectral calibration file is critical to evaluate multicolor systems. The PowerPlex® 4-Dye Matrix Standards contain matrix fragments labeled with four fluorescent dyes: Fluorescein, JOE, TMR and CXR. Once generated, the spectral calibration file is applied during collection of PowerPlex® data to calculate and compensate for spectral overlap between different fluorescent dye colors.

Storage Conditions: Store at –20°C. The matrix standards are light-sensitive; therefore, minimize light exposure.

PowerPlex® Matrix Standards, 310/377

Product	Size	Cat.#
PowerPlex® Matrix Standards, 310/377	50 µl	DG3640
Not For Medical Diagnostic Use.		

Description: The PowerPlex® Matrix Standards, 310/377, allows the *GenePrint*® Fluorescent STR Systems to be analyzed on the ABI PRISM® 310 Genetic Analyzer or ABI PRISM® 377 DNA Sequencer.

Proper generation of a spectral calibration file is critical to evaluate multicolor systems. The PowerPlex® Matrix Standards, 310/377, contains matrix fragments labeled with five fluorescent dyes: Fluorescein, JOE A, JOE B, TMR and CXR. Once generated using the PowerPlex® dye set, the spectral calibration file is applied during analysis of PowerPlex® data to calculate and compensate for spectral overlap between different fluorescent dye colors. The PowerPlex® Matrix Standards, 310/377, contains two tubes of JOE, designated JOE A and JOE B.

The PowerPlex® Matrix Standards, 3100 (Cat.# DG3650 and X3121), have been discontinued. Contact Promega Technical Services for more information (genetic@promega.com).

Internal Lane Standard 600

Product	Size	Cat.#
Internal Lane Standard 600	150 µl	DG1071
For Laboratory Use.		

Description: The Internal Lane Standard 600 (ILS 600) consists of 22 bands ranging in size from 60bp to 600bp. Fragments of 60–200bp are spaced at 20bp intervals, fragments of 200–500bp are spaced every 25 bases, and fragments of 500–600bp are spaced every 50 bases. Fragments that are multiples of 100 bases have fluorescence intensities approximately twice that of other fragments to simplify size assignment. The DNA ladder is double-stranded and asymmetrically labeled with carboxy-X-rhodamine (CXR). The Internal Lane Standard 600 is used to assign sizes to DNA fragments separated by electrophoresis and detected using a variety of fluorescence-detection instruments (e.g., Hitachi FMBIO® Fluorescence Imaging System and ABI PRISM® 310, 3100, 3100-*Avant* and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers). ILS 600 is commonly used as an internal size marker for other applications and can be visualized by detecting fluorescent emission at 597nm after excitation at 576nm.

In addition, the Internal Lane Standard 600 contains additives that prevent the formation of two artifacts ("split peak" and "n–10") at the vWA locus in the PowerPlex® 16 and 16 HS Systems when using ABI PRISM® 3100, 3100-*Avant* and Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers.

Storage Conditions: Store at –20°C. Avoid multiple freeze-thaw cycles or exposure to frequent temperature changes. These fluctuations can greatly alter product stability. The Internal Lane Standard 600 is light-sensitive; therefore, minimize light exposure.

GenePrint® Fluorescent STR Systems

Product	Size	Cat.#
GammaSTR™ Multiplex (Fluorescein) D16S539, D7S820, D13S317, D5S818	100 reactions	DC6071
CSF1PO, TPOX, TH01, vWA Multiplex (Fluorescein)	100 reactions	DC6301
Available Separately	**Size**	**Cat.#**
CTTv Allelic Ladder Mix (Fluorescein)	150 µl	DG2121
GammaSTR™ Allelic Ladder Mix (Fluorescein)	150 µl	DG3291

DC6071, DC6301 Not For Medical Diagnostic Use. DG2121, DG3291 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *GenePrint*® Fluorescent STR Systems were developed for use with the Hitachi FMBIO® Fluorescence Imaging Systems and ABI PRISM® 377 DNA Sequencer. One primer for each locus is labeled with fluorescein to allow fluorescent detection. Fluorescein has an excitation maximum at 488nm and an emission maximum at 532nm. Therefore, the systems are compatible with a variety of fluorescence-detection instruments, including the ABI PRISM® 310, 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130 and 3130*xl* Genetic Analyzers.

Each system provides all materials required to amplify STR regions of purified genomic DNA except *Taq* DNA polymerase. Amplification of DNA using the system components plus *Taq* DNA polymerase produces fluorescein-labeled fragments representing alleles from the template DNA. For instruments that support two-color fluorescence detection, additional precision may be achieved by including the Internal Lane Standard 600 (Cat.# DG1071) in each gel lane or injection.

Features:

- **High-Throughput Analysis:** Analysis is achieved by comparing amplified DNA fragments directly with the allelic ladder provided for each locus.
- **Efficiency:** The fluorescent STR multiplex systems support simultaneous single-tube amplification of four polymorphic STR loci with nonoverlapping allele size ranges.
- **Allelic Ladders:** Comparing amplified alleles with allelic ladders provided with each system allows rapid and reliable allele assignment.

Storage Conditions: Store at –20°C. The fluorescent primer pairs and allelic ladders are light-sensitive; therefore, minimize light exposure.

GenePrint® STR Systems (Silver Stain Detection)

Product	Size	Cat.#
GenePrint® SilverSTR™ III System (D7S820, D13S317, D16S539)	100 reactions	DC6451
CSF1PO, TPOX, TH01 Multiplex	100 reactions	DC6001
F13A01, FESFPS, vWA Multiplex	100 reactions	DC6031
Available Separately	**Size**	**Cat.#**
CTT Allelic Ladder Mix	150 µl	DG2101
FFv Allelic Ladder Mix	150 µl	DG2141

DC6451, DC6001, DC6031 Not For Medical Diagnostic Use. DG2101, DG2141 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *GenePrint*® Silver STR Systems provide a rapid, non-radioactive method to evaluate small amounts (e.g., 1ng) of human DNA. The systems provide all materials required to amplify STR regions of purified genomic DNA except for *Taq* DNA polymerase and sample DNA. The amplified STR fragments are separated by polyacrylamide gel electrophoresis and detected by silver staining.

The combination of SilverSTR™ III, CTT and FFv provides access to seven of the thirteen core loci that comprise the Combined DNA Index System (CODIS) database.

Features:

- **Economical:** The *GenePrint*® Silver STR Systems do not require fluorescence-detection equipment for analysis. The systems are ideal for labs that are starting STR analysis or do not wish to purchase expensive fluorescence-detection equipment.
- **Efficient:** Analysis requires less than one day. Each multiplex allows simultaneous amplification of three nonoverlapping STR loci for high discrimination power.

Storage Conditions: Store at –20°C.

GenePrint® Sex Identification System

Product	Size	Cat.#
Amelogenin (Fluorescein Detection)	100 reactions	DC5171

Not For Medical Diagnostic Use.

Description: The *GenePrint*® Sex Identification System can be used for sex determination. When used under reaction conditions recommended in the Technical Manual (#TMD006), a specific segment of the human X chromosome generates a 212bp product, while the corresponding human Y-chromosomal DNA segment produces a 218bp fragment. The Amelogenin locus may be co-amplified and co-analyzed with a compatible multiplex system by mixing the Amelogenin primers with those of the appropriate multiplex system prior to use.

Storage Conditions: Store at –20°C. The fluorescent primer pair and ladder are light-sensitive; therefore, minimize light exposure.

Available in the Helix® on-site stocking system

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Gold ST★R 10X Buffer

Product	Size	Cat.#
Gold ST★R 10X Buffer	1.2 ml	DM2411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Gold ST★R 10X Buffer can be used to amplify STR loci using AmpliTaq Gold® DNA polymerase. Gold ST★R Buffer can be substituted for the STR 10X Buffer that is supplied with PowerPlex® and *GenePrint®* STR Systems, allowing the use of either AmpliTaq® or AmpliTaq Gold® DNA polymerase. This buffer includes BSA for a more robust reaction and improved results under nonoptimal conditions. The combination of Gold ST★R 10X Buffer and AmpliTaq Gold® DNA polymerase can result in greater sensitivity and reduced amplification artifacts.

Storage Conditions: Store at –20°C.

2800M Control DNA

Product	Size Conc.	Cat.#
2800M Control DNA	25 µl 10 ng/µl	DD7101
	500 µl 0.25 ng/µl	DD7251

Not For Medical Diagnostic Use.

Description: The 2800M Control DNA is a single-source male human genomic DNA. This DNA can be used as a control for human STR analysis.

Storage Conditions: Store at 2–10°C.

K562 DNA High Molecular Weight

Product	Size	Cat.#
K562 DNA High Molecular Weight	30 µg	DD2011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: K562 DNA is purified from a subculture of the human chronic myelogenous leukemia cell line. K562 DNA serves as a control for most steps of the single-locus probe analysis procedure. The DNA also can be used as a reference for determining fragment sizes of VNTR alleles following appropriate restriction digestion. K562 fragment sizes obtained may vary slightly due to interlaboratory differences in protocols and methods of analysis.

Concentration: 0.4–1.0µg/µl.

Storage Conditions: Store at –20°C. Always avoid multiple freeze-thaw cycles or exposure to frequent temperature changes. These fluctuations can greatly alter product stability.

Biochemical Reagents

Product	Size	Cat.#
SILVER SEQUENCE™ Staining Reagents	10 gels	Q4132
STR 10X Buffer	1.2 ml	DM2211
Gold ST★R 10X Buffer	1.2 ml	DM2411
Agarose	1 kg	DV3123
STR 2X Loading Solution	3 ml	DV4331
Blue Dextran Loading Solution	3 × 1 ml	DV4351
Bromophenol Blue Loading Solution	3 × 1 ml	DV4371
Mineral Oil	12 ml	DY1151

Q4132, DM2211, DM2411, DV3123, DV4331, DY1151 For Research Use Only. Not for Use in Diagnostic Procedures. DV4351, DV4371 Not For Medical Diagnostic Use.

Description: Promega offers supporting reagents for separation, hybridization and detection of specific loci in the human genome. These quality-tested reagents are optimized for use with Promega genetic identity systems.

Storage Conditions: Store Cat.# DM2211, DM2411, DV4331, DV4351 and DV4371 at –20°C. Store Cat.# Q4132, DV3123 and DY1151 at 22–25°C.

11 Imaging and Immunological Detection

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Cellular Imaging with HaloTag®

HaloTag® Fluorescent Ligands

Product	Size Conc.	Cat.#
HaloTag® TMR Ligand	30 µl 5 mM	G8251
	15 µl 5 mM	G8252
HaloTag® Oregon Green® Ligand	30 µl 1 mM	G2801
	15 µl 1 mM	G2802
HaloTag® diAcFAM Ligand	30 µl 1 mM	G8272
	15 µl 1 mM	G8273
HaloTag® Coumarin Ligand	30 µl 10 mM	G8581
	15 µl 10 mM	G8582
HaloTag® Alexa Fluor® 488 Ligand	30 µl 1 mM	G1001
	15 µl 1 mM	G1002
HaloTag® Alexa Fluor® 660 Ligand	30 µl 3.5 mM	G8471
	15 µl 3.5 mM	G8472
HaloTag® TMRDirect™ Ligand	30 µl 0.1 mM	G2991
HaloTag® R110Direct™ Ligand	30 µl 0.1 mM	G3221
HaloTag® Biotin Ligand	30 µl 5 mM	G8281
	15 µl 5 mM	G8282
HaloTag® PEG-Biotin Ligand	30 µl 5 mM	G8591
	15 µl 5 mM	G8592

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Fluorescent Ligands can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Fluorescent Ligands allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

HaloTag® Fluorescent Ligands for Cellular Imaging

Cell-permeant fluorescent ligands (rapid labeling protocol):

- HaloTag® TMR Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® Oregon Green® Ligand ($496_{Ex}/516_{Em}$)
- HaloTag® diAcFAM Ligand ($494_{Ex}/526_{Em}$)
- HaloTag® Coumarin Ligand ($353_{Ex}/434_{Em}$)

Cell-impermeant fluorescent ligands for cell-surface labeling (rapid labeling protocol):

- HaloTag® Alexa Fluor® 488 Ligand ($494_{Ex}/517_{Em}$)
- HaloTag® Alexa Fluor® 660 Ligand ($663_{Ex}/690_{Em}$)

Cell-permeant fluorescent ligands ("no wash" protocol):

- HaloTag® TMRDirect™ Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® R110Direct™ Ligand ($502_{Ex}/527_{Em}$)

The Alexa Fluor® 488 Ligand is impermeable to cell membranes and, therefore, used to label cell surface proteins. The TMR Ligand, Oregon Green® Ligand, diAcFAM Ligand and Coumarin Ligand readily cross the cell membrane and, therefore, can be used to label intracellular proteins.

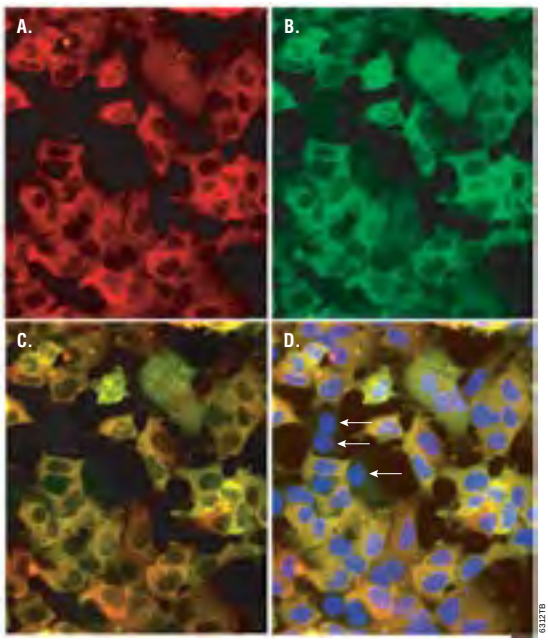
HaloTag® Ligands for Protein Detection

The HaloTag® Biotin Ligand consists of a 12-atom linker arm to biotin and is used as an affinity tag to capture the HaloTag® protein-based fusion construct using the strong biotin-streptavidin interaction.

The HaloTag® PEG-Biotin Ligand contains a spacer not found in the HaloTag® Biotin Ligand. This provides a significantly longer and more flexible linker between streptavidin and the HaloTag® protein, which may be advantageous in preserving the activity of a HaloTag® fusion partner protein upon immobilization or derivatization.

Features:

- **Label in Solution or on a Solid Support:** The HaloTag® Ligands bind to the HaloTag® protein or protein fusions with high specificity and affinity.
- **Label Your HaloTag® Protein in Live Cells:** The HaloTag® TMR, diAcFAM, Coumarin and Biotin Ligands readily cross the cell membrane.
- **Pull Down Protein Complexes:** The spacer and reactive linker of the HaloTag® PEG-Biotin Ligand provide ideal pull-down capabilities. Alternatively, pull down directly with the HaloLink™ Resin.
- **Image Fixed Cells:** The covalent bond is stable, allowing imaging of fixed cells and analysis of the labeled protein under stringent conditions.
- **Introduce Novel Functionalities or Perform Sequential Labeling:** The open architecture of the technology enables the use of different ligands for multiple applications.
- **Design Only One Genetic Construct for Multiple Experiments:** Obtain new functionality by using a different HaloTag® Ligand without having to design and clone a new expression construct.
- **Analyze Labeled Fusion Proteins Using SDS-PAGE, Mass Spectrometry and Other Methods:** The bound ligand is stable under denaturing conditions.



Colabeling of HaloTag®-p65 fusion protein with HaloTag® TMR Ligand and the Anti-HaloTag® pAb. Panel A. Cytoplasmic (red) labeling of HEK293-p65-HT2 cells by HaloTag® TMR Ligand. **Panel B.** Cytoplasmic (green) labeling by Anti-HaloTag® pAb and Alexa Fluor® 488-conjugated anti-rabbit IgG (Invitrogen). **Panel C.** Colocalization of ligand and antibody binding activities. **Panel D.** Merger of red and green fluorescence with counterstaining of the nucleus by DAPI (blue). Arrows denote rare cells that show little or no expression of HaloTag®-p65. Protocols developed and performed at Promega.

HaloTag® Ligand Building Blocks

Product	Size	Cat.#
HaloTag® Amine (04) Ligand	5 mg	P6741
HaloTag® Amine (02) Ligand	5 mg	P6711
HaloTag® Iodoacetamide (04) Ligand	5 mg	P6771
HaloTag® Iodoacetamide (02) Ligand	5 mg	P1681
HaloTag® Succinimidyl Ester (04) Ligand	5 mg	P6751
HaloTag® Succinimidyl Ester (02) Ligand	5 mg	P1691
HaloTag® Thiol (04) Ligand	5 mg	P6761

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Ligand Building Blocks can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Ligand Building Blocks allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

The HaloTag® Succinimidyl Ester (04) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkyl chloride separated by three ethylene glycol repeats (04). The HaloTag® Succinimidyl Ester (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Succinimidyl Ester (02) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkylchloride separated by an ethylene glycol repeat (02). The HaloTag® Succinimidyl Ester (02) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Amine (04) Ligand contains a reactive amine group connected to an alkyl chloride, separated by an ethylene glycol repeat (04). The HaloTag® Amine (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides, and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Amine (02) Ligand contains a reactive amine group connected to an alkylchloride, separated by an ethylene glycol repeat (02). The HaloTag® Amine (02) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide, or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides, and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Iodoacetamide (04) Ligand contains a reactive iodoacetamide group connected an alkyl chloride separated by an ethylene glycol repeat (04). The HaloTag® Iodoacetamide (04) Ligand has been designed to rapidly react with sulfhydryl-containing molecules, whether small organic compounds, peptides or proteins. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Iodoacetamide (02) Ligand contains a reactive iodoacetamide group connected to an alkylchloride separated by an ethylene glycol repeat (02). HaloTag® Iodoacetamide (02) Ligand has been designed to rapidly react with sulfhydryl-containing molecules, whether small organic compounds, peptides or proteins. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Thiol (04) Ligand contains a reactive sulfhydryl group connected to an alkyl chloride separated by three ethylene glycol repeats (04). The HaloTag® Thiol (04) Ligand can be successfully conjugated to any reporter group, cross-linking reagent (bound or free), or nucleic acid derivative containing a number of different alkylating groups, forming stable thioether bonds. Commonly used reagents that rapidly react with sulfhydryls include iodo- or bromo-acetyls or benzyls, bromo- or chloro-mustards, maleimides, aziridines, acryloyl derivatives, and halide or sulfonate containing arenes (those bearing Electron Withdrawing Groups (EWGs) react most rapidly). The reactive ligand can be captured with HaloTag® protein either before or after the thiol group is functionalized for any application of interest.

Storage Conditions: Store Cat.# P1691 and P6751 at or below –70°C under inert atmosphere. Store Cat.# P6711 and P6741 at or below –20°C in an air-tight container in the absence of light. Store Cat.# P1681, P6771 and P6761 at or below –20°C under inert atmosphere in the absence of light. See Promega Product Information for additional details on individual products.

Anti-HaloTag® pAb

Product	Size Conc.	Cat.#
Anti-HaloTag® pAb	200 µg 1 mg/ml	G9281

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Anti-HaloTag® pAb is a purified rabbit polyclonal antibody raised against the HaloTag® protein. The antibody is purified using Protein G affinity resin and supplied at 1mg/ml in PBS. The antibody detects HaloTag® fusion proteins in Western blot hybridization and immunocytochemistry applications with high sensitivity and specificity. The HaloTag® protein is not endogenous to mammalian, plant and *E. coli* cells. *E. coli* and mammalian cell extracts demonstrate low cross-reactivity with the Anti-HaloTag® pAb.

Features:

- **Specificity:** The Anti-HaloTag® pAb is specific for HaloTag® protein and exhibits low cross-reactivity with *E. coli* and mammalian cell extracts.

Storage Conditions: Store at –20°C.

HaloTag® Fusion (C-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTC HaloTag® CMV-neo Vector	20 µg	G7711
pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	G8421
pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	G8431
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321

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For additional information see page 300.

Available in the Helix® on-site stocking system

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HaloTag® Fusion (N-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTN HaloTag® CMV-neo Vector	20 µg	G7721
pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	G8441
pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	G8451
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981

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For additional information see page 301.

Relative Mammalian Protein Expression Levels for HaloTag® Flexi® Vectors.

Vector Name	Cat.#	Expression Level*
pFC14A HaloTag® CMV Flexi® Vector	G9651	High
pFC14K HaloTag® CMV Flexi® Vector	G9661	High
pFC15A HaloTag® CMV*d1* Flexi® Vector	G1611	Medium
pFC15K HaloTag® CMV*d1* Flexi® Vector	G1601	Medium
pFC16A HaloTag® CMV*d2* Flexi® Vector	G1591	Low
pFC16K HaloTag® CMV*d2* Flexi® Vector	G1571	Low
pFC17A HaloTag® CMV*d3* Flexi® Vector	G1551	Ultra-Low
pFC17K HaloTag® CMV*d3* Flexi® Vector	G1321	Ultra-Low
pFN21A HaloTag® CMV Flexi® Vector	G2821	High
pFN21K HaloTag® CMV Flexi® Vector	G2831	High
pFN22A HaloTag® CMVd1 Flexi® Vector	G2841	Medium
pFN22K HaloTag® CMVd1 Flexi® Vector	G2851	Medium
pFN23A HaloTag® CMV*d2* Flexi® Vector	G2861	Low
pFN23K HaloTag® CMV*d2* Flexi® Vector	G2871	Low
pFN24A HaloTag® CMV*d3* Flexi® Vector	G2881	Ultra-Low
pFN24K HaloTag® CMV*d3* Flexi® Vector	G2981	Ultra-Low
pFC27A HaloTag® CMV-neo Flexi® Vector	G8421	High[1]
pFC27K HaloTag® CMV-neo Flexi® Vector	G8431	High[2]
pFN28A HaloTag® CMV-neo Flexi® Vector	G8441	High[1]
pFN27K HaloTag® CMV-neo Flexi® Vector	G8451	High[2]

9161LB

ELISAs and Antibodies

BDNF E_{max}® ImmunoAssay Systems

Product	Size	Cat.#
BDNF E_{max}® ImmunoAssay System	2 × 96 wells	G7610
	5 × 96 wells	G7611

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The BDNF E_{max}® ImmunoAssay Systems provide optimized reagents and a protocol for the sensitive and specific detection of brain-derived neurotrophic factor (BDNF). After an overnight coating of a 96-well plate, the specific protein is detected using an antibody sandwich format. The systems use a horseradish peroxidase-conjugated secondary antibody and a single-component TMB substrate for the final chromogenic detection of bound neurotrophic factor. Using this system, BDNF in tissue culture supernatants, tissue homogenates, plasma and urine can be quantitated in the range of 7.8–500pg/ml. Binding and recovery from mouse brain homogenates has not been fully characterized.

Features:

- **High Value:** Optimized reagents and protocol provided.
- **Specificity:** Specific detection of BDNF; less than 3% cross-reactivity with other related neurotrophic and growth factors.
- **Sensitivity:** Detect picogram levels of factor per milliliter of sample.
- **Flexibility:** Available kits provide sufficient reagents for two or five 96-well plates; you can configure your plates as desired.

Plates are not included.

Storage Conditions: Store the entire system in its original package protected from light at –20°C.

GDNF E_{max}® ImmunoAssay Systems

Product	Size	Cat.#
GDNF E_{max}® ImmunoAssay System	2 × 96 wells	G7620
	5 × 96 wells	G7621

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GDNF E_{max}® ImmunoAssay Systems provide optimized reagents and a protocol for the sensitive and specific detection of glial cell-line-derived neurotrophic factor (GDNF). After an overnight coating of a 96-well plate, the specific protein is detected using an antibody sandwich format. The systems use horseradish peroxidase-conjugated secondary antibody and a single-component TMB substrate for the final chromogenic detection of bound neurotrophic factor. Using this system, GDNF in tissue culture supernatants or tissue homogenates can be quantitated in the range of 15.6–1,000pg/ml.

Features:

- **High Value:** Optimized reagents and protocol provided.
- **Specificity:** Specific detection of GDNF; less than 3% cross-reactivity with other related neurotrophic and growth factors.
- **Sensitivity:** Detect picogram levels of factor per milliliter of sample.
- **Flexibility:** Available kits provide sufficient reagents for two or five 96-well plates; you can configure your plates as desired.

Plates are not included.

Storage Conditions: Store the entire system in its original package protected from light at –20°C. Once thawed, store the system (except the GDNF Standard) at 4°C.

NGF E_{max}® ImmunoAssay Systems

Product	Size	Cat.#
NGF E_{max}® ImmunoAssay System	2 × 96 wells	G7630
	5 × 96 wells	G7631

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The NGF E_{max}® ImmunoAssay Systems provide optimized reagents and a protocol for the sensitive and specific detection of biologically active nerve growth factor (NGF). After an overnight coating of a 96-well plate, the specific protein is detected using an antibody sandwich format. The systems use horseradish peroxidase-conjugated secondary antibody and a single-component TMB substrate for the final chromogenic detection of bound neurotrophic factor. The system can be used to quantitate NGF in tissue culture supernatants and tissue extracts in the range of 3.9–250pg/ml. Avoid using samples containing high levels of IgG such as serum, plasma and spleen.

Features:

- **High Value:** Optimized reagents and protocol provided.
- **Specificity:** Specific detection of NGF; less than 3% cross-reactivity with other related neurotrophic and growth factors.
- **Sensitivity:** Detect picogram levels of factor per milliliter of sample.
- **Flexibility:** Available kits provide sufficient reagents for two or five 96-well plates; you can configure your plates as desired.

Plates are not included.

Storage Conditions: Store the entire system in its original package protected from light at –20°C.

Block & Sample 5X Buffer

Product	Size	Cat.#
Block & Sample 5X Buffer	54 ml	G3311

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Block & Sample 5X Buffer is optimized for use in the E_{max}® ImmunoAssay Systems (for BDNF, GDNF and NGF) providing additional buffer for further sample dilutions and manipulations. This buffer is used to block the plates and dilute the standards, samples, detection antibodies and conjugates in these E_{max}® ImmunoAssay Systems. The buffer is provided as 54ml of buffer containing gentamicin as a preservative.

Note: The Block & Sample 5X Buffer should not be used with the TGFβ_1 E_{max}® ImmunoAssay System.

Storage Conditions: Store at 4°C.

TGFβ_1 E_{max}® ImmunoAssay Systems

Product	Size	Cat.#
TGFβ_1 E_{max}® ImmunoAssay System	2 × 96 wells	G7590
	5 × 96 wells	G7591

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TGFβ_1 E_{max}® ImmunoAssay System provides optimized reagents and a protocol for the sensitive and specific detection of transforming growth factor β_1 (TGFβ_1). After an overnight coating of a 96-well plate, the specific protein is detected using an antibody sandwich format. The system uses horseradish peroxidase-conjugated secondary antibody and a single-component TMB substrate for the final chromogenic detection of bound TGFβ_1. Using this system, biologically active TGFβ_1 in tissue culture supernatants, plasma, serum or urine can be quantitated in the range of 15.6–1,000pg/ml.

Features:

- **High Value:** Optimized reagents and protocol provided.
- **Specificity:** Specific detection of TGFβ_1; less than 3% cross-reactivity with other related growth factors (TGFβ_2 and TGFβ_3).
- **Sensitivity:** Detect picogram levels of factor per milliliter of sample.
- **Flexibility:** Available kits provide sufficient reagents for two or five 96-well plates; you can configure your plates as desired.

Plates are not included.

Storage Conditions: Store the entire system in its original package protected from light at –20°C.

TGFβ Sample 10X Buffer

Product	Size	Cat.#
TGFβ Sample 10X Buffer	20 ml	G1291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TGFβ Sample 10X Buffer is an optimized proprietary buffer designed for use with the TGFβ_1 E_{max}® ImmunoAssay System to reduce high background, a common problem with traditional buffers used in TGFβ ELISAs.

Storage Conditions: Store at 4°C.

Anti-pS^{473} Akt pAb

Product	Size	Cat.#
Anti-pS^{473} Akt pAb	40 µl	G7441

For Research Use Only. Not for Use in Diagnostic Procedures.

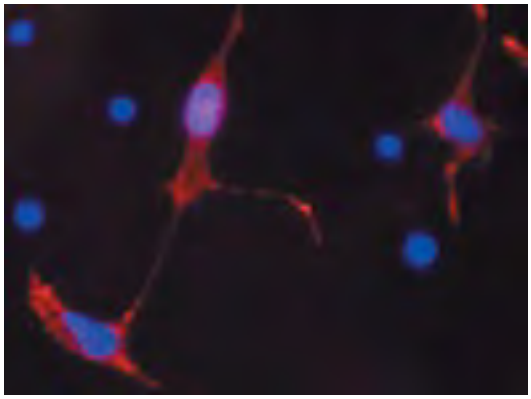
Description: Anti-pS^{473} Akt pAb is an affinity-purified polyclonal rabbit antibody. The antibody is purified using a phosphorylated peptide that corresponds to the phospho-S^{473} form of Akt-1 and is useful for both Western blotting and immunocytochemistry.

Features:

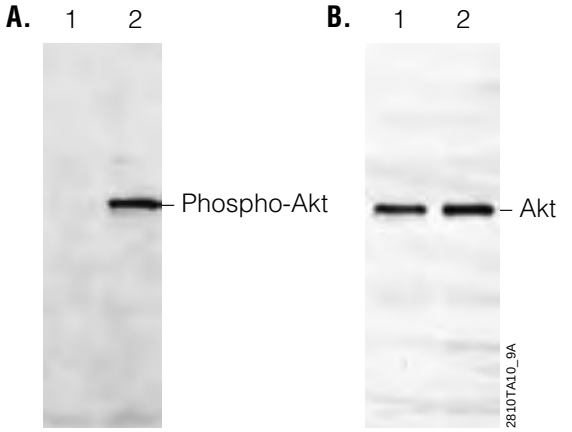
- **Specificity:** The antibody is selective for the Ser^{473} phosphorylated isoforms of Akt and does not show cross-reactivity with nonphosphorylated Akt.
- **Immunogen:** Peptide from the singly phosphorylated Ser^{473} region from the C-terminus of Akt-1 protein.
- **Antibody Form:** Affinity-purified rabbit IgG, supplied in PBS with 50µg/ml gentamicin.
- **Value:** Will generate 100ml of blotting solution, sufficient for 10 Western blots of 10ml each.

Storage Conditions: Store at 4°C for daily/weekly use or dispense into aliquots and store at –20°C for long-term storage.

Available in the Helix® on-site stocking system



Immunocytochemical staining of Akt in embryonic rat brain cells. Embryonic (day 17) rat brain cells were collected and treated with 20ng/ml each of EGF and FGF. Anti-pS^{473} Akt pAb was used at a 1:50 dilution. Positive cells were visualized using a donkey anti-rabbit, Cy®3-conjugated secondary antibody. Nuclei were stained using DAPI. Protocols developed and performed at Promega.



Detection of phosphorylated Akt by Western blot analysis with Anti-pS^{473} Akt pAb. Panel A. NIH/3T3 total cell extract (10µg per lane) was resolved by polyacrylamide gel electrophoresis and blotted onto nitrocellulose. Lane 1, untreated cells; lane 2, cells pretreated with PDGF (Invitrogen) at 50ng/ml for 20 minutes. Anti-pS^{473} Akt pAb (Cat.# G7441) was used at a 1:2,500 dilution. The blot was probed with Donkey Anti-Rabbit IgG (H+L), HRP, Anti-ACTIVE® Qualified pAb (Cat.# V7951) at 1:10,000 dilution followed by chemiluminescent detection. **Panel B.** A pan-Akt pAb (New England Biolabs) reveals total Akt in both stimulated and unstimulated NIH/3T3 cell extracts. Secondary antibody and detection methods were the same as those used in Panel A.

Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)

Product	Size	Cat.#
Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)	40 µl	V7931
	120 µl	V7932

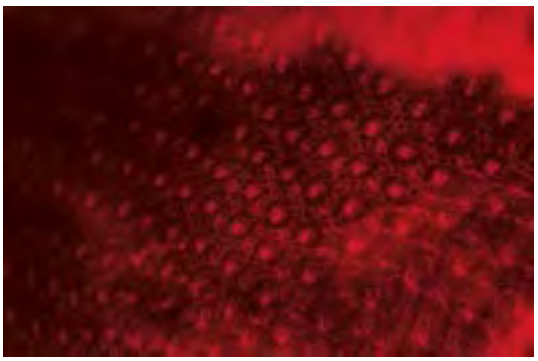
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-ACTIVE® JNK pAb is a polyclonal antibody from rabbit serum. The antibody is affinity purified using a dually phosphorylated peptide that corresponds to the active form of the JNK enzymes.

Features:

- **Specificity:** Preferentially detects the dually phosphorylated, active form of the stress-activated protein kinase (SAPK), also known as c-Jun N-terminal kinase, JNK.
- **Immunogen:** Dually phosphorylated Thr/Pro/Tyr region (pTPpY) derived from the catalytic core of the active form of JNK kinase, which corresponds to Thr^{183} and Tyr^{185} of the mammalian JNK2 enzyme.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in 10mM sodium phosphate (pH 7.4), 20mM NaCl.
- **Value:** Anti-ACTIVE® JNK pAb is available in two convenient sizes. Cat.# V7931 will generate up to 200ml of blotting solution, sufficient for 20 Western blots of 10ml each. The larger size, Cat.# V7932, will generate up to 600ml of blotting solution, sufficient for 60 Western blots of 10ml each.

Storage Conditions: Store at –20°C.



Immunocytochemical detection of active JNK enzyme in *Drosophila* pupal retina using the Anti-ACTIVE® JNK pAb. *Drosophila* pupal retina at 25% of pupal development were fixed in 3% paraformaldehyde in PBS. The Anti-ACTIVE® JNK pAb was diluted 1:100 in PBS containing 10% fetal bovine serum and 0.2% Triton® X-100. Samples were incubated with the primary antibody overnight at 4˚C, washed 3 times (10 minutes each) with 0.2% Triton® X-100 and then incubated with a goat anti-rabbit Cy®3 conjugate for 2 hours at 4˚C. Whole mounts were visualized with a Zeiss® Axioskop fluorescent microscope. The results illustrate the presence of dually phosphorylated, active forms of JNK in discrete structures of the fly retinal ommatidia including intense staining of the inner cone cells as well as the mechanosensory bristles and surrounding pigment cells. The pattern of staining (which was distinct from results obtained with an antibody for active p38) and the absence of staining in control experiments (data not shown) support the high specificity of the Anti-ACTIVE® JNK pAb. Image kindly provided by David T. Miller and Ross Cagan, Department of Molecular Biology and Pharmacology, Washington University School of Medicine, St. Louis, Missouri.

Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)

Product	Size	Cat.#
Anti-ACTIVE® MAPK pAb, Rabbit, (pTEpY)	40 µl	V8031

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-ACTIVE® MAPK pAb is a polyclonal rabbit antibody. The antibody is affinity purified using a dually phosphorylated peptide that corresponds to the active form of the mitogen-activated protein (MAP) kinase enzymes.

Features:

- **Specificity:** Preferentially detects the dually phosphorylated, active form of the mitogen-activated protein kinase (MAPK) enzymes (ERK1 and ERK2).
- **Immunogen:** Dually phosphorylated Thr/Glu/Tyr region (pTEpY) derived from the catalytic core of the active form of the mitogen-activated protein kinase (MAPK) enzymes, ERK1 and ERK2, which corresponds to Thr^{183} and Tyr^{185} of the mammalian ERK2 enzyme.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in PBS (pH 7.4).
- **Value:** When used at the recommended 1:5,000 dilution, this product will generate 200ml of blotting solution, sufficient for 20 Western blots of 10ml each.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system
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Anti-ACTIVE® p38 pAb, Rabbit, (pTGpY)

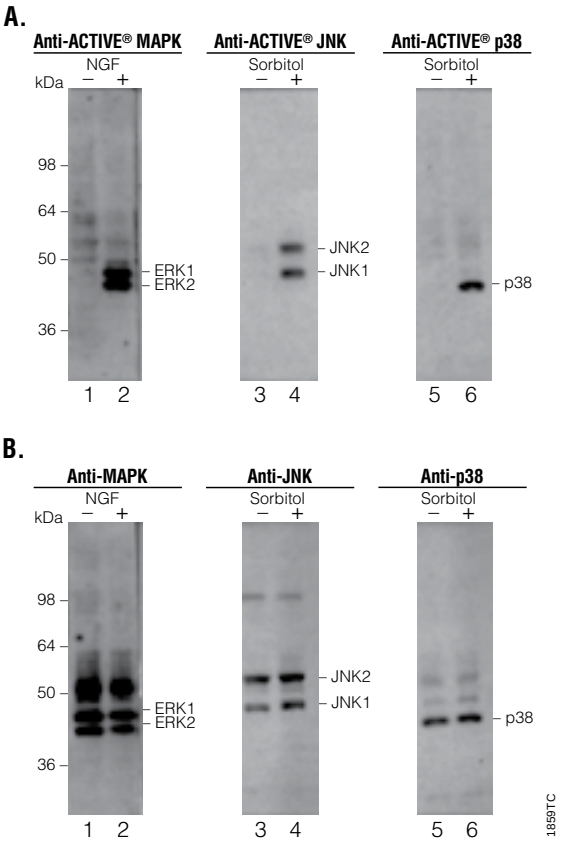
Product	Size	Cat.#
Anti-ACTIVE® p38 pAb, Rabbit, (pTGpY)	100 µl	V1211
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Anti-ACTIVE® p38 pAb is a polyclonal rabbit antibody. The antibody is affinity-purified using a dually phosphorylated peptide that corresponds to the active form of the p38 enzymes.

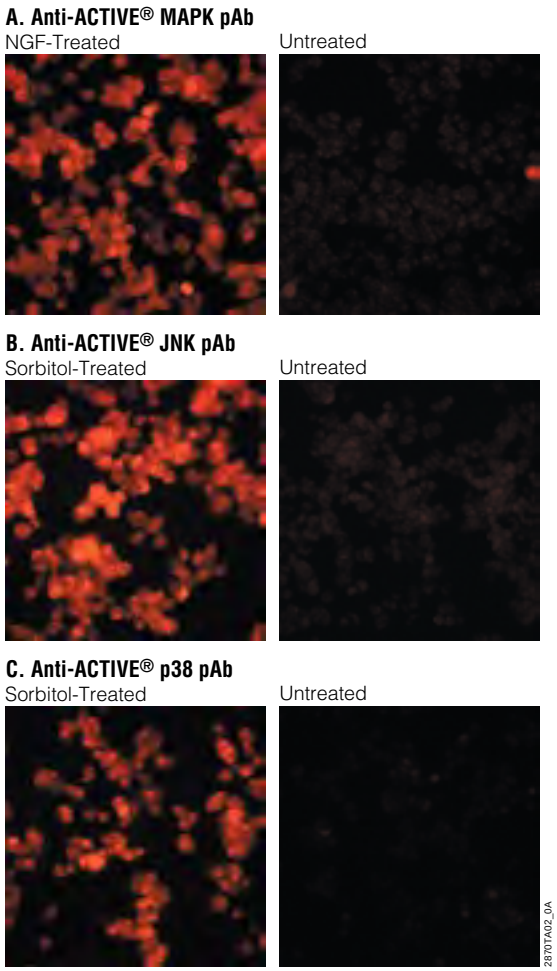
Features:

- **Specificity:** Preferentially detects the dually phosphorylated, active form of p38 kinase.
- **Immunogen:** Dually phosphorylated Thr/Gly/Tyr region (pTGpY) derived from the catalytic core of the active form of p38 kinase, which corresponds to Thr^{180} and Tyr^{182} of the mammalian p38 enzyme.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in PBS (pH 7.4).
- **Value:** When used at the recommended 1:2,000 dilution, this product will generate up to 200ml of blotting solution, sufficient for 20 Western blots of 10ml each.

Storage Conditions: Store at –20°C.



Detection of MAPK, JNK and p38 in PC12 cell extracts. Panel A. Western blot analysis using Anti-ACTIVE® MAPK, Anti-ACTIVE® JNK and Anti-ACTIVE® p38 polyclonal antibodies to detect activated MAPK, JNK and p38. **Panel B.** Western blot analysis using anti-MAPK, anti-JNK and anti-p38 antibodies to detect activated and nonactivated MAPK, JNK and p38 in untreated or NGF- or sorbitol-treated PC12 cells.



Detection of activated MAPK, JNK and p38 in PC12 cells by immunocytochemistry. PC12 cells were grown to 80% confluence in RPMI 1640 medium supplemented with 25mM HEPES, 300mg/L L-glutamine, 10% horse serum, 5% fetal bovine serum and 0.5mM EGTA. Cells were either untreated or treated with 200ng/ml NGF or 1M sorbitol as indicated. ICC was performed as described in Promega Technical Bulletin #TB262. Anti-ACTIVE® antibodies were used at the following dilutions: **Panel A.** MAPK, 1:500; **Panel B.** JNK, 1:1,000; **Panel C.** p38, 1:500. Protocols developed and performed at Promega.

Anti-ERK 1/2 pAb, Rabbit

Product	Size	Cat.#
Anti-ERK 1/2 pAb, Rabbit	40 µl	V1141

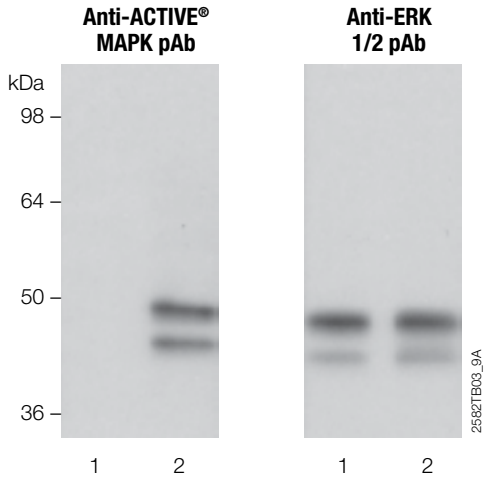
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-ERK 1/2 pAb is a polyclonal antibody purified from rabbit serum. The antibody is affinity-purified using a peptide sequence in human/rat ERK1.

Features:

- **Specificity:** Detects ERK1 and ERK2 in the nonphosphorylated, monophosphorylated and dually phosphorylated forms.
- **Immunogen:** Sequence representing a conserved region in human and rat ERK1 located outside of the catalytic core of the enzyme.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in PBS (pH 7.4).
- **Value:** When used at the recommended 1:5,000 dilution, this product will generate up to 200ml of blotting solution, sufficient for 20 Western blots of 10ml each.

Storage Conditions: Store at –20°C.



Detection of the specifically phosphorylated form of MAPK in NGF-treated PC12 cell extracts. Anti-ACTIVE® MAPK pAb (Cat.# V8031) and Anti-ERK 1/2 ("pan ERK 1/2") pAb (Cat.# V1141) detection of ERK 1/2 in untreated (lanes 1) or NGF-treated (lanes 2) PC12 cell extracts (2µg).

Anti-Human BDNF pAb

Product	Size	Cat.#
Anti-Human BDNF pAb	200 µg	G1641

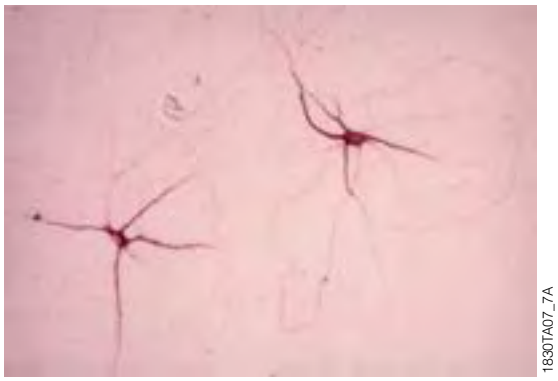
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: BDNF, a 27kDa homodimer originally derived from human brain, shares high sequence homology with NGF, NT-3 and NT-4/5 and influences many neuron types in the CNS. Anti-Human BDNF pAb is generated in chickens and purified using a proprietary polyethylene glycol procedure. IgY, the 180kDa chicken IgG homolog, can be produced in chickens against certain biological antigens that fail to elicit a humoral immune response in rabbits or other mammals due to species relatedness. This antibody is highly specific for BDNF.

Features:

- **Immunogen:** Human recombinant BDNF.
- **Antibody Form:** Chicken IgY, provided at 0.5mg/ml in 0.1M NaCl, 0.01M K_2HPO_4 and 50µg/ml gentamicin.
- **Specificity:** Cross-reactive between mammalian species; does not cross-react with other neurotrophic factors.

Storage Conditions: Store at 4°C.



Localization of BDNF in primary cultures of hippocampal neurons. The Anti-Human BDNF pAb was used at a 1:200 dilution. Primary antibody was detected using HRP-conjugated goat anti-chicken IgY secondary antibody. Photomicrograph kindly provided by Dr. Laurie Goodman, Lynx Therapeutics, Hayward, CA. Reprinted by permission of Academic Press, Goodman, L. *et al.* (1996) *Mol. Cell Neurosci.* **7**, 222.

Available in the Helix® on-site stocking system
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Anti-ACTIVE® Caspase-3 pAb

Product	Size	Cat.#
Anti-ACTIVE® Caspase-3 pAb	50 µl	G7481

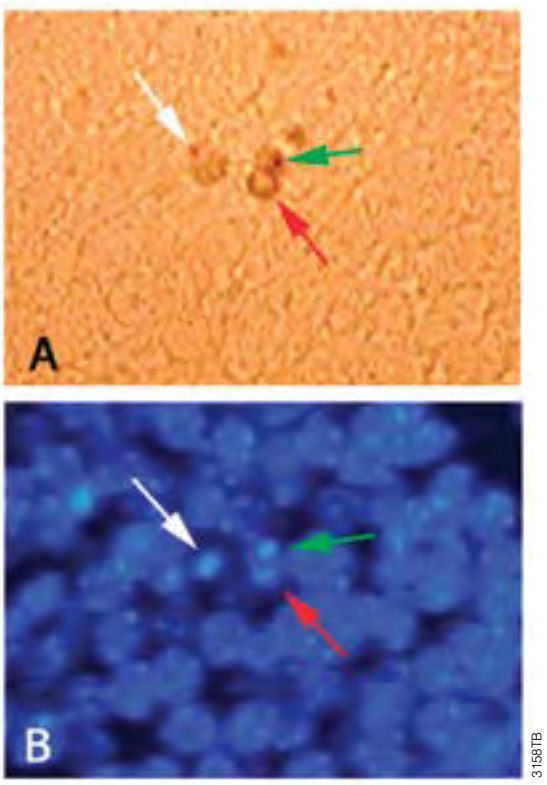
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-ACTIVE® Caspase-3 pAb is intended for use as a marker of apoptosis; it specifically stains apoptotic cells without staining nonapoptotic cells. Includes sufficient antibody to perform 125 immunocytochemical assays (100µl/assay) at a 1:250 dilution.

Features:

- **Immunogen:** Peptide derived from the p17 fragment of caspase-3 and having sequence homology in human, mouse, rat and hamster.
- **Antibody Form:** Affinity-purified rabbit IgG; supplied in Dulbecco's PBS.
- **Specificity:** Specifically recognizes the cleaved active form of caspase-3 in human, rat and mouse.

Storage Conditions: Store at –20°C.



Demonstration of Anti-ACTIVE® Caspase-3 pAb positive cells in postnatal day 0 (P0) mouse brain paraffin-embedded sections. Panel A. Three Anti-ACTIVE® Caspase-3 pAb-positive cells (colored arrows). **Panel B.** Corresponding DAPI-stained nuclei. Note the correspondence of Anti-ACTIVE® Caspase-3 pAb label with the typical apoptotic, condensed nuclear morphology in Panel B. Protocols developed and performed at Promega.

Anti-β-Galactosidase mAb

Product	Size Conc.	Cat.#
Anti-β-Galactosidase, Purified Monoclonal Antibody	100 µg 2.0–2.5 mg/ml	Z3781
	2 mg 2.0–2.5 mg/ml	Z3783

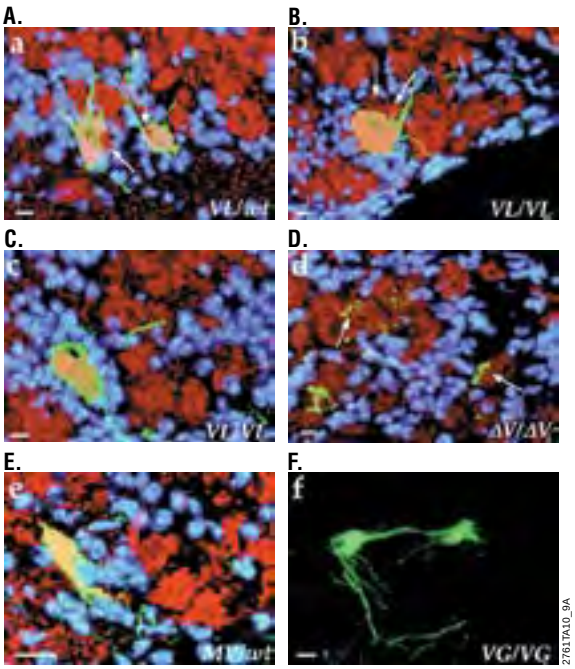
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: This antibody [subclass $IgG_{2a}(\kappa)$] was purified from ascites of a mouse hybridoma and recognizes *E. coli* β-galactosidase.

Features:

- **Immunogen:** β-galactosidase.
- **Antibody Form:** 2.0–2.5mg/ml in 10mM Tris-HCl (pH 8.0), 150mM NaCl, 0.02% sodium azide.
- **Specificity:** *E. coli* β-galactosidase near the C-terminal end.

Storage Conditions: Store undiluted at –20°C.



Histological analysis of axonal termination in the accessory olfactory bulb (AOB). Sagittal sections through the AOB stained with the Anti-β-Galactosidase mAb (Cat.# Z3781; green) and antibodies against synaptophysin (DAKO, red). DAPI staining is shown in blue. **Panel A.** Heterozygous VL mouse. **Panels B and C.** Homozygous VL mouse. **Panel D.** Homozygous ΔV mouse. **Panel E.** Heterozygous MV mouse. **Panel F.** Homozygous VG mouse. Details on gene targeting, mutations and immunostaining may be found in Rodriguez, J., Feinstein, P. and Mombaerts, P. (1999) *Cell* **97**, 199. Images kindly provided by Dr. Peter Mombaerts, The Rockefeller University, New York. Reprinted by permission of Cell Press.

Anti-Human GDNF pAb

Product	Size	Cat.#
Anti-Human GDNF pAb	200 µg	G2791

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Human glial cell-line-derived neurotrophic factor (GDNF), a 30kDa homodimer, has been shown to be a potent survival factor for a variety of neurons. The receptor complex for GDNF has been elucidated, though members of the multicomponent receptor family continue to grow. With applications in Western blotting, ELISA and immunostaining, the Anti-Human GDNF pAb is a useful tool to continue the investigation of GDNF's role in multiple facets of neurological systems.

Features:

- **Immunogen:** Human recombinant GDNF.
- **Antibody Form:** Chicken IgY; 0.5mg/ml in 0.1M NaCl, 0.01M K_2HPO_4, 50µg/ml gentamicin.
- **Specificity:** Cross-reactive between mammalian species; does not cross-react with TGFα, TGFβ_1, NGF or BDNF at up to 10µg/ml.

Storage Conditions: Store at 4°C.

Anti-HaloTag® Monoclonal Antibody

Product	Size	Conc.	Cat.#
Anti-HaloTag® Monoclonal Antibody	200 µg	1 mg/ml	G9211

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-HaloTag® Monoclonal Antibody is a mouse monoclonal antibody raised against the HaloTag® protein, which can be used to detect HaloTag® fusion proteins by Western blotting. The HaloTag® platform addresses the need for flexibility in functional protein analysis for cell imaging, protein purification and protein pull-down applications.

Features:

- **Specific to HaloTag® Protein:** Little to no cross-reactivity with other non-HaloTag proteins.
- **More Sensitive Detection Over the Existing Anti-HaloTag® pAb:** Detect as low as 0.5–1ng of HaloTag® fusion protein by Western blot.

Storage Conditions: Store at –30°C to –10°C.

Anti-Luciferase pAb

Product	Size	Cat.#
Anti-Luciferase pAb	200 µg	G7451

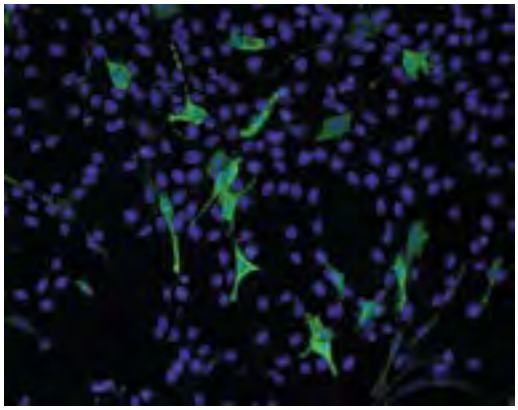
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-Luciferase pAb is a goat polyclonal antibody designed for use in immunocytochemistry and Western blot applications. Anti-Luciferase pAb can detect luciferase enzyme expression in situ.

Features:

- **Immunogen:** 61kDa recombinant luciferase from North American firefly (*Photinus pyralis*).
- **Antibody Form:** Goat polyclonal IgG at 1mg/ml in PBS containing 50µg/ml gentamicin.
- **Specificity:** Anti-Luciferase pAb is specific for firefly luciferase (*Photinus pyralis*) and does not cross-react with sea pansy (*Renilla reniformis*) luciferase.

Storage Conditions: Store at 4°C.



NIH/3T3 cells transiently transfected with a luciferase gene. Luciferase-expressing cells were detected using the Anti-Luciferase pAb (Cat.# G7451). Protocols developed and performed at Promega.

Available in the Helix® on-site stocking system
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Anti-NGF mAb

Product	Size	Cat.#
Anti-NGF mAb	20 µg	G1132
	100 µg	G1131

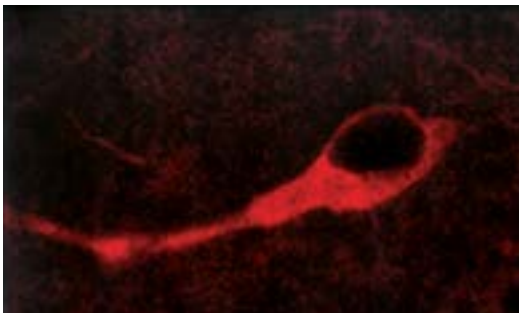
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Nerve growth factor (NGF) is a member of the neurotrophin family of growth factors. NGF is expressed in sympathetic and sensory-innervated peripheral tissues and mediates phosphorylation of specific intracellular proteins. At the cellular level, NGF expression has been demonstrated in lymphocytes, smooth muscle cells, epithelial cells, astrocytes, fibroblasts and Schwann cells. Anti-NGF mAb was designed as a specific marker of NGF in Western blotting, ELISA and immunostaining applications.

Features:

- **Immunogen:** Purified murine NGF, 2.5S.
- **Antibody Form:** Rat IgG (clone 1G3) provided at 1mg/ml as frozen liquid in PBS containing no preservatives.
- **Specificity:** Reacts with human NGF, 2.5S mNGF and to a lesser extent with 7S mNGF. Cross-reacts between mammalian species.
- **Activity:** The Anti-NGF mAb exhibits a half-maximal titer of less than or equal to 250ng/ml in an ELISA protocol using 100ng of 2.5S mNGF (Cat.# G5141).

Storage Conditions: Store at –20°C.



1283TA12_5B

Rat basal forebrain cholinergic neuron stained with Anti-NGF mAb following intraventricular injection of 30µg of NGF and factor uptake. Photomicrograph kindly provided by Dr. Charles Howe, University of California, San Francisco.

Anti-Human NT-3 pAb

Product	Size	Cat.#
Anti-Human NT-3 pAb	200 µg	G1651

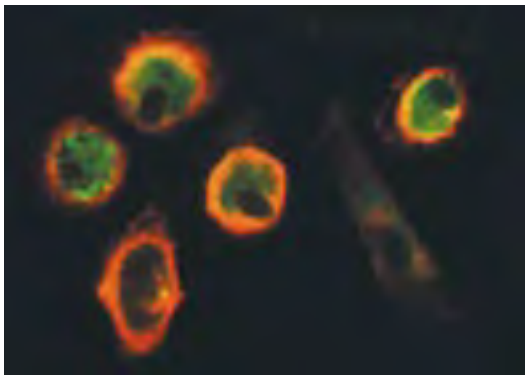
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Neurotrophin-3, a 27kDa homodimer that shares high sequence homology with NGF, BDNF, NT-4 and NT-5, influences many neuron types in the central and peripheral nervous system. NT-3 is also highly conserved across species. Anti-Human NT-3 pAb is generated in chickens and purified using a proprietary polyethylene glycol procedure. IgY, the 180kDa chicken IgG homolog, can be produced in chickens against certain biological antigens that fail to elicit a humoral immune response in rabbits or other mammals due to species relatedness. This antibody is highly specific for NT-3 in a variety of mammalian species.

Features:

- **Immunogen:** Human recombinant NT-3.
- **Antibody Form:** Chicken IgY is provided at 0.5mg/ml in 0.1M NaCl, 0.01M K_2HPO_4 and 50µg/ml gentamicin.
- **Specificity:** Cross-reactive with human and mouse NT-3 and is presumed to cross-react with rat and Rhesus monkey NT-3 based on factor sequence identity across species; does not cross-react with BDNF or NGF and has limited cross-reactivity to NT-4.

Storage Conditions: Store at 4°C.



1411TA03_6A

Immunofluorescent detection of NT-3 in monocyte-derived macrophages and purified human fetal microglia. Chicken Anti-Human NT-3 pAb in red and RCA-1 (macrophage marker) in green. Image kindly provided by Drs. Pam Sarnacki, Wanda Wang and Chris Achim, University of Pittsburgh.

Anti-PARP p85 Fragment pAb

Product	Size	Cat.#
Anti-PARP p85 Fragment pAb	50 µl	G7341

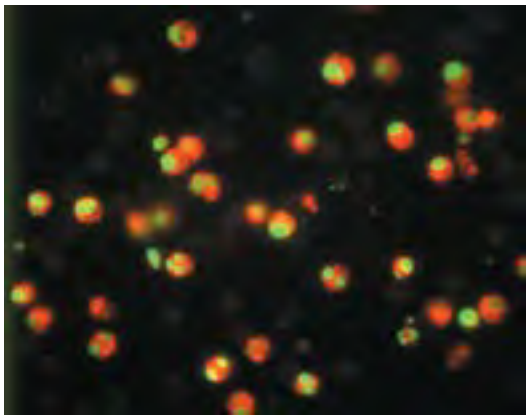
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Poly (ADP-ribose) polymerase (PARP), a nuclear enzyme involved in DNA repair, is a well known substrate for caspase-3 cleavage during apoptosis. Anti-PARP p85 Fragment pAb is a rabbit polyclonal antibody specific for the p85 fragment of PARP that results from caspase cleavage of the 116kDa intact molecule and thus provides an in situ marker for apoptosis. The antibody is affinity-purified using a peptide that corresponds to a region of the p85 fragment of PARP. The PARP immunogen is a synthetic peptide, gly-val-asp-glu-val-ala-lys (GVDEVAK), representing the N-terminus of the large C-terminal fragment of human PARP that results from caspase-3 cleavage. Each batch of antibody is quality assurance tested for use in immunostaining applications and contains sufficient antibody for 50 immunocytochemical reactions at the suggested working dilution of 1:100.

Features:

- **Immunogen:** N-terminal peptide from p85 fragment.
- **Antibody Form:** Affinity-purified rabbit polyclonal antibody provided in Dulbecco's PBS.
- **Specificity:** Specifically detects PARP p85 fragment in human, rat and bovine cells and tissues. Does not recognize the 116kDa intact PARP protein.

Storage Conditions: Store at –20°C.



Anti-PARP p85 Fragment pAb and TUNEL double-labeling of apoptotic Jurkat cells. Cells were labeled with the Anti-PARP p85 Fragment pAb (red) and the DeadEnd™ Fluorometric TUNEL System (Cat.# G3250; green). The colocalization of cleaved PARP in cells containing TUNEL-positive nuclei demonstrates that the Anti-PARP p85 Fragment pAb specifically labels apoptotic cells. Protocols developed and performed at Promega.

Anti-Human p75 pAb

Product	Size	Cat.#
Anti-Human p75 pAb	200 µg	G3231

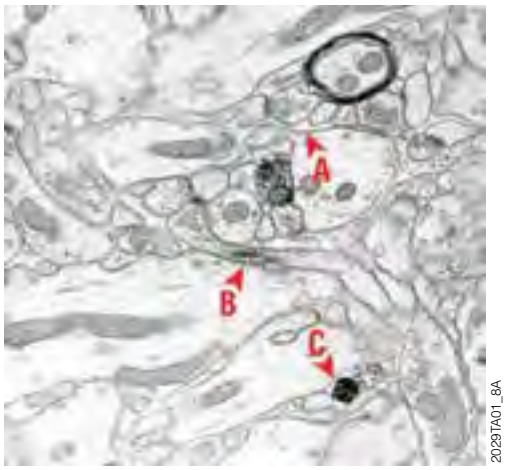
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The p75 neurotrophin receptor ($p75^{NTR}$), also known as low-affinity NGF receptor (LNGFR) and $p75^{LNGFR}$, binds nerve growth factor, brain-derived neurotrophic factor, neurotrophin-3 and neurotrophin-4 with varying specificities. $p75^{NTR}$ plays an important role in neurotrophic factor signaling including neuronal apoptosis. Anti-Human p75 pAb provides a valuable tool for understanding the role of $p75^{NTR}$ in neuronal death.

Features:

- **Immunogen:** Cytoplasmic domain of the human p75 neurotrophin receptor.
- **Antibody Form:** Purified rabbit IgG; 1mg/ml in PBS containing 50µg/ml gentamicin.
- **Specificity:** Human, rat, mouse and chicken p75.

Storage Conditions: Store at 4°C.



Electron micrograph demonstrating immunostaining with Anti-Human p75 pAb in the inner molecular layer of the rat dentate gyrus. An axon terminal containing p75 immunoreactivity (A ➤) is seen forming a synapse with a large unlabeled dendrite. Also labeled are a lengthwise axonal profile (B ➤) and a small axonal cross section (C ➤ . Pre-embedding (Epon) immunohistochemistry was visualized with VECTASTAIN® ABC Reagent. Myelin sheath appears black due to OsO_4 fixation. Image kindly provided by Drs. Karen Dougherty and Teresa Milner, Cornell University Medical College.

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Anti-TGFβ$_1$ pAb

Product	Size	Cat.#
Anti-TGFβ$_1$ pAb	100 µg	G1221

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Transforming growth factor β$_1$ (TGFβ$_1$) is a 25kDa homodimer composed of two 12.5kDa subunits held together by disulfide bonds. TGFβ$_1$ is a protein of immense interest to a number of fields and has been associated with intracellular matrix deposition and tissue repair/damage, cell cycle control and apoptosis. The Anti-TGFβ$_1$ pAb is directed against biologically active human TGFβ$_1$, providing a useful tool to analyze TGFβ$_1$ in Western blot analysis or immunostaining applications.

Features:

- **Immunogen:** Biologically active human TGFβ$_1$.
- **Antibody Form:** Rabbit IgG provided at 1mg/ml in PBS containing 0.02mg/ml gentamicin as a preservative.
- **Specificity:** Reacts with biologically active TGFβ$_1$ with no cross-reactivity to TGFβ$_2$ and TGFβ$_3$.

Storage Conditions: Store at –20°C.

Anti-βIII Tubulin mAb

Product	Size	Cat.#
Anti-βIII Tubulin mAb	100 µg	G7121

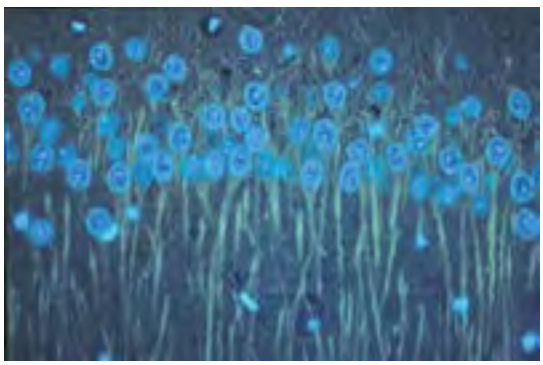
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Anti-βIII Tubulin mAb is a protein G-purified IgG$_1$ monoclonal antibody (from clone 5G8) raised in mice against a peptide (EAQGPK) corresponding to the C-terminus of βIII tubulin. It is directed against βIII tubulin, a specific marker for neurons. The major use of this antibody is for labeling neurons in tissue sections and cell culture. The antibody has been tested to perform in frozen and paraffin-embedded sections of rat brain, cerebellum and spinal cord, human and rat fetal CNS progenitor cell cultures and adult human paraffin-embedded brain.

Features:

- **Immunogen:** Peptide corresponding to the C-terminus (EAQGPK) of βIII tubulin.
- **Antibody Form:** Mouse monoclonal IgG$_1$ (clone 5G8), 1mg/ml in PBS containing no preservatives.
- **Specificity:** Cross-reacts with most mammalian species. Does not label nonneuronal cells (e.g., astrocytes).

Storage Conditions: Store at 4°C.



Immunostaining for βIII tubulin in rat cerebellum using Anti-βIII Tubulin mAb. Paraffin-embedded rat brain section double-immunofluorescence labeled with the primary antibody and detected using an anti-mouse Cy®3-conjugated secondary antibody (yellow). Nuclei were stained with DAPI (blue). Protocols developed and performed at Promega.

Donkey Anti-Rabbit IgG (H+L) HRP, Anti-ACTIVE® Qualified

Product	Size	Cat.#
Donkey Anti-Rabbit IgG (H+L), HRP	60 µl	V7951

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Donkey Anti-Rabbit Ig, (H+L), HRP, are horseradish peroxidase-conjugated secondary antibodies specifically tested for use with the Anti-ACTIVE® antibodies. They are qualified for use in Western blot analysis using chemiluminescent and colorimetric detection methods. These antibody conjugates exhibit minimal cross-reactivity to goat, mouse and sheep IgG, bovine serum albumin (BSA) and proteins in mammalian cell extracts. These secondary antibody conjugates provide low background and highly specific signals when used at the recommended dilutions with Anti-ACTIVE® MAPK, Anti-ACTIVE® JNK and Anti-ACTIVE® p38 pAbs. The conjugates are provided in phosphate-buffered saline containing BSA as a stabilizer and gentamicin as a preservative.

Features:

- **Sensitivity:** When conjugates are used in a Western blot at a 1:10,000 dilution along with Anti-ACTIVE® MAPK pAb (Cat.# V8031), they can detect active MAP kinase in 5µg of activated (nerve growth factor [NGF]-treated) PC12 cell extract using colorimetric detection.
- **Specificity:** Preferentially detects rabbit IgG with minimum reactivity with immunoglobulins from other species (including goat, sheep and mouse) or with bovine serum albumin and mammalian cell extract proteins.
- **Value:** 60µl per vial, sufficient to generate 300–600ml of Western blotting solution when used at the recommended dilution of 1:5,000 to 1:10,000.
- **Immunogen:** Intact rabbit IgG (H+L chains).
- **Antibody Form:** Donkey IgG, affinity-purified polyclonal antibody conjugated to horseradish peroxidase (HRP).

Storage Conditions: Store at –20°C.

Alkaline Phosphatase-Conjugated Antibodies

Product	Size	Cat.#
Anti-Mouse IgG (H+L), AP Conjugate	100 µl	S3721
Anti-Rabbit IgG (Fc), AP Conjugate	100 µl	S3731
Anti-Human IgG (H+L), AP Conjugate	100 µl	S3821
Anti-Rat IgG (H+L), AP Conjugate	100 µl	S3831
Donkey Anti-Goat IgG, AP	60 µl	V1151
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Polyclonal secondary antibodies raised in goat or donkey, immunoaffinity-purified using corresponding immobilized antigens and conjugated to alkaline phosphatase (AP) enzyme. The products (unless otherwise noted) are supplied as 1mg/ml solutions. The **Anti-Mouse IgG (H+L), AP Conjugate and Anti-Rat IgG (H+L), AP Conjugate** antibodies bind to both heavy and light chains for all IgG subclasses. The **Anti-Rabbit IgG (Fc), AP Conjugate** antibody reacts with the heavy chains of rabbit IgG but not with the light chains. The **Anti-Human IgG (H+L), AP Conjugate** antibody reacts with heavy and light chains of all subclasses of human IgG as well as with light chains on other human immunoglobulins; it displays minimal cross-reactivity to horse or bovine serum proteins. As with all antibodies, in certain applications some species-dependent antigen-dependent cross-reactivity may be observed. A starting working dilution of 1:2,500 is suggested for most Western blot, dot blot and ELISA applications. The optimum concentration of secondary antibody depends on the application and will need to be empirically determined.

Donkey Anti-Goat IgG, AP Conjugate is a secondary antibody developed in donkeys against goat IgG; it has been affinity-purified and conjugated to alkaline phosphatase.

Features:

- **Extensive Validation:** Use with confidence, as supported by numerous publications.
- **Ready-to-Use Formulation:** No need to dissolve the antibody.
- **Flexible Dispensing:** We can readily accommodate large-scale custom orders. Please inquire at: **www.promega.com/custom/**

Storage Conditions: Store the unopened product at –20°C. Store opened **Anti-Human IgG (H+L), HRP Conjugate, Anti-Mouse IgG (H+L), HRP Conjugate and Anti-Rabbit IgG (H+L), HRP Conjugate** at 4°C.

Horseradish Peroxidase-Conjugated Antibodies

Product	Size	Cat.#
Anti-Rabbit IgG (H+L), HRP Conjugate	300 µl	W4011
Anti-Mouse IgG (H+L), HRP Conjugate	300 µl	W4021
Anti-Human IgG (H+L), HRP Conjugate	300 µl	W4031
Anti-Chicken IgY, HRP Conjugate	300 µl	G1351
Donkey Anti-Goat IgG, HRP	60 µl	V8051
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Polyclonal secondary antibodies raised in goat, rabbit or donkey, immunoaffinity-purified using corresponding immobilized antigens and conjugated to horseradish peroxidase (HRP) enzyme. The **Anti-Human IgG (H+L), HRP Conjugate, Anti-Mouse IgG (H+L), HRP Conjugate and Anti-Rabbit IgG (H+L), HRP Conjugate** antibodies bind to both heavy and light chains for all IgG subclasses. As with all antibodies, in certain applications some species-dependent antigen-dependent cross-reactivity may be observed. The products (unless otherwise noted) are supplied as 1mg/ml solutions. A starting working dilution of 1:2,500 is suggested for most Western blot, dot blot and ELISA applications. The optimum concentration of secondary antibody depends on the application and will need to be empirically determined.

Rabbit Anti-Chicken IgY, HRP Conjugate is a secondary antibody developed in rabbits against chicken IgY. Anti-Chicken IgY, HRP Conjugate recognizes both the heavy and light chains of IgY and has been validated for use in Western blots, dot blots and ELISAs.

Donkey Anti-Goat IgG, HRP Conjugate is a secondary antibody developed in donkeys against goat IgG. Donkey Anti-Goat IgG, HRP Conjugate shows reactivity to goat and sheep IgG but minimal cross-reactivity to rabbit and mouse IgG. For Western blot applications with chromogenic detection use at a starting dilution of 1:10,000.

Features:

- **Extensive Validation:** Use with confidence, as supported by numerous publications.
- **Ready-to-Use Formulation:** No need to dissolve the antibody.
- **Flexible Dispensing:** We can readily accommodate large-scale custom orders. Please inquire at: **www.promega.com/custom/**

Storage Conditions: Store the unopened product at –20°C. Store opened **Anti-Human IgG (H+L), HRP Conjugate, Anti-Mouse IgG (H+L), HRP Conjugate and Anti-Rabbit IgG (H+L), HRP Conjugate** at 4°C.

Anti-Chicken IgY, HRP Conjugate

Product	Size	Cat.#
Anti-Chicken IgY, HRP Conjugate	300 µl	G1351
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: This secondary antibody is developed in rabbits against chicken IgY, and has been affinity purified and conjugated to horseradish peroxidase. The Anti-Chicken IgY, HRP Conjugate recognizes both the heavy and light chains of IgY. This antibody has been validated for use in Western blots, dot blots and ELISAs.

Formulation: 1mg/ml in 10mM KPO_4 (pH 7.6), 0.15M NaCl, 10mg/ml BSA and 0.01% gentamicin.

Storage Conditions: Store at –20°C. Avoid multiple freeze-thaw cycles.

TMB One Solution

Product	Size	Cat.#
TMB One Solution	100 ml	G7431
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: TMB One Solution is a chromagen substrate, 3,3′,5,5′-tetramethylbenzidine (TMB) provided in a mildly acidic, nonhazardous buffer for horseradish peroxidase detection in an ELISA format. The substrate is provided as a single solution at a ready-to-use working dilution. The substrate develops a blue reaction product when oxidized by peroxidase and a yellow reaction product in an endpoint multiwell assay after the addition of an acid solution provided by the end user.

Features:

- **Convenient:** Single solution provided ready-to-use; just add, incubate, stop and read. This homogeneous reagent improves assay variation.
- **Stable:** Stable for 12 months at 4°C, providing extended shelf life; the assay end product is stable for at least one hour after stopping the assay.
- **Safe:** Provided in a slightly acidic, nonhazardous proprietary buffer without aprotic solvents; noncaustic to plastics used in automated systems.
- **Sensitive:** Low background provides greater assay sensitivity.

Storage Conditions: Store at 4°C protected from light.

Available in the Helix® on-site stocking system
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In vivo Imaging

VivoGlo™ Luciferin, In Vivo Grade

Product	Size	Cat.#
VivoGlo™ Luciferin, In Vivo Grade	50 mg	P1041
	1 g	P1043
	250 mg	P1042

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase genes from the North American firefly (*Photinus pyralis*) and from other beetles are commonly used as light-emitting reporters in cellular and animal models. VivoGlo™ Luciferin is the potassium salt of D-luciferin, the firefly luciferase substrate capable of generating light when a suitable model is used.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

VivoGlo™ Caspase 3/7 Substrate (Z-DEVD-Aminoluciferin Sodium Salt)

Product	Size	Cat.#
VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt)	50 mg	P1781
	5 × 50 mg	P1782

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt) is a firefly luciferase prosubstrate containing the DEVD tetrapeptide sequence recognized by caspase-3 and -7. Upon activation of caspase-3 or -7, the DEVD peptide is cleaved, and the liberated aminoluciferin reacts with luciferase to generate measurable light. Cleavage has been shown in in cellulo and in vivo systems. For mice, activity of a related salt was demonstrated when 10mg of the substrate in 150µl of saline was injected intraperitoneally. Other references suggest that doses as low as 1.5mg per mouse (50mg/kg) can be used. We recommend conducting a preliminary dose-response study using no more than 500mg/kg.

VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt) has a minimum solubility of 500mg/ml in PBS, and the resulting solution is stable for at least 3 days at room temperature. Injection is usually done via the intraperitoneal route, and imaging is generally started 10 minutes after injection.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

VivoGlo™ Luciferin-β-Galactosidase Substrate (6-O-β-galactopyranosyl luciferin)

Product	Size	Cat.#
VivoGlo™ Luciferin-β-Galactoside Substrate (6-O-β-galactopyranosyl luciferin)	50 mg	P1061
	250 mg	P1062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin-β-galactoside is a substrate for the commonly used reporter enzyme β-galactosidase. The substrate is cleaved by β-galactosidase to form luciferin and galactose. When used in a model system expressing firefly luciferase, the luciferin is then utilized in a firefly luciferase reaction to generate light.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

EnduRen™ In Vivo *Renilla* Luciferase Substrate

Product	Size	Cat.#
EnduRen™ In Vivo *Renilla* Luciferase Substrate	0.34 mg	P1111
	3.4 mg	P1112

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EnduRen™ in vivo *Renilla* Luciferase Substrate is a uniquely engineered coelenterazine-based compound with protected oxidation sites. These modifications are designed to minimize substrate degradation and autoluminescence. It is reported that EnduRen™ Substrate may have a longer kinetic output when compared to the native coelenterazine substrate when used in an in vivo imaging application in a mouse model.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

ViviRen™ In Vivo *Renilla* Luciferase Substrate

Product	Size	Cat.#
ViviRen™ In Vivo *Renilla* Luciferase Substrate	0.37 mg	P1231
	3.7 mg	P1232

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ViviRen™ in vivo *Renilla* Luciferase Substrate is a uniquely engineered coelenterazine-based compound with protected oxidation sites. These modifications are designed to minimize substrate degradation and auto-luminescence. It is reported that the ViviRen™ Substrate demonstrates brighter output when compared to the native coelenterazine substrate when used in an in vivo imaging application in a mouse model.

Cat.# P1231 is supplied as a liquid, 60mM in DMSO. Cat.# P1232 is supplied as a lyophilized solid.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

XENOGEN now part of Caliper Life Sciences Caliper LifeSciences

pGL4 in vivo Imaging Vectors

Product	Size	Cat.#
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGL4 Luciferase Reporter Vectors are the next generation of reporter gene vectors optimized for expression in mammalian cells. Numerous configurations of pGL4 Vectors are available. The pGL4.50 and pGL4.51 Vectors offer the synthetic firefly luciferase *luc2* gene under the control of the strong constitutive CMV (cytomegalovirus) promoter. These vectors have demonstrated high expression levels in a variety of cell lines tested. The addition of a selectable marker, either hygromycin or neomycin, also allows the creation of stable cell lines. Cell lines with constant expression of luciferase can be used in animal models to study in vivo changes in cell physiology.

Features:

- Prebuilt luciferase expression vector.
- *luc2* luciferase gene provides highest expression.
- Selectable markers for generating stable cell lines.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system
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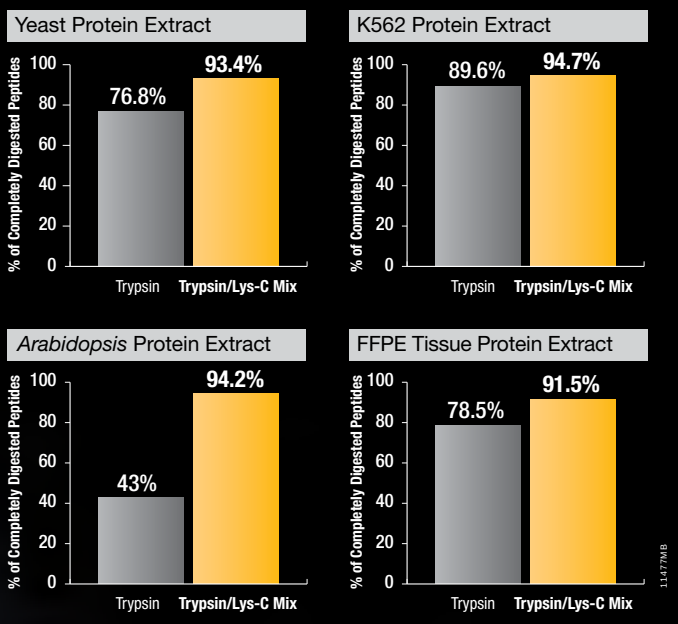
Promega

Trypsin/Lys-C Mix

See what you've been missing

Trypsin/Lys-C Mix, Mass Spec Grade enables more complete digestion than Trypsin alone.



Trypsin/Lys-C Mix, Mass Spec Grade, misses fewer cleavage sites than Trypsin alone. All the digests were performed overnight at 37°C.

The Trypsin/Lys-C Mix enhanced activity and tolerance to trypsin-inhibiting contaminants means fewer missed cleavages. The result is more peptides and better mass spectrometry data.

Learn more about Trypsin/Lys-C Mix and its advantages, visit:

www.promega.com/GetMore

12 Industrial and Environmental Monitoring

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For more information visit: **www.promega.com/helix**

DNA Purification From Food

Wizard® Magnetic DNA Purification System for Food

Product	Size	Cat.#	
Wizard® Magnetic DNA Purification System for Food	200 preps	FF3750	536
	400 preps	FF3751	914
Available Separately	**Size**	**Cat.#**	
Lysis Buffer A, Food	100 ml	A8191	62
Lysis Buffer B, Food	100 ml	Z3191	54
Precipitation Solution, Food	150 ml	Z3201	227

A8191, Z3191, Z3201 For Research Use Only. Not for Use in Diagnostic Procedures. FF3750, FF3751 For in vitro use only.

Description: The Wizard® Magnetic DNA Purification System for Food is designed for purification of DNA from a variety of food samples including corn seeds, cornmeal, soybeans, soy flour and soy milk. Processed food, such as corn chips, chocolate and chocolate-containing foods, lecithin and vegetable oils may also be used with the suggested protocol variations. The DNA purified from these samples can be used in PCR-based testing for genetically modified organism (GMO) DNA sequences.

Features:

- **Improved Productivity:** Obtain results in one-third the time of current methods.
- **Ease of Handling:** Requires minimal centrifugation and eliminates organic extractions.
- **Versatility and Robustness:** Validated with a broad variety of foodstuffs, including difficult samples such as lecithin and vegetable oils.

Storage Conditions: Store at 22–25°C.

Wizard® Magnetic 96 DNA Plant System

Product	Size	Cat.#	
Wizard® Magnetic 96 DNA Plant System	2 × 96 preps	FF3760	366
	4 × 96 preps	FF3761	697
Available Separately	**Size**	**Cat.#**	
Wash Buffer, Plant	40 ml	A3811	85

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Wizard® Magnetic 96 DNA Plant System is designed for manual or automated 96-well, high-throughput purification of DNA from plant leaf and seed tissue. The system has been validated with corn and tomato leaf, as well as with canola and sunflower seeds. The DNA purified from these samples can be used in PCR as well as more demanding applications such as RAPD analysis. Unlike column-based systems, the binding of nucleic acids to magnetic particles can occur in solution, enhancing contact with the wash buffer and increasing nucleic acid purity.

Protocols are available for Beckman Coulter instruments.

Features:

- **Improved Productivity:** Manual and automated 96-well protocols cut purification time compared to CTAB extraction.
- **Ease of Handling:** Eliminates organic extractions, multiple centrifugations and cumbersome filter plates.
- **Confidence in Applications Performance:** Validated for both leaf and seed tissue by PCR and RAPD analysis.
- **Automation:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at 22–25°C.

Microbial Detection and Quantitation

ENLITEN® ATP Assay System

Product	Size	Cat.#	
ENLITEN® ATP Assay System	100 assays	FF2000	169

For in vitro use only.

Description: The ENLITEN® ATP Assay System can be used to measure ATP levels for the indirect detection of biocontamination on food processing surfaces, in cosmetics and beverages or to assay for enzymes that degrade ATP and to quantitate ATP in biological fluids.

Features:

- **Less Variation:** Stable light output.
- **User Friendly:** Easy-to-prepare reagents.
- **Performance:** Fast and convenient assay method.
- **Sensitive:** Detects as little as 10^{-15} moles of ATP.

Storage Conditions: Store at –20°C unopened. See product insert for individual component storage conditions before and after opening.

ENLITEN® rLuciferase/Luciferin Reagent

Product	Size	Cat.#	
ENLITEN® rLuciferase/Luciferin Reagent	100 assays	FF2021	135

For in vitro use only.

Description: The ENLITEN® rLuciferase/Luciferin Reagent is intended for the rapid and quantitative detection of ATP in liquid samples. The reagent is designed to measure 10^{-11} to 10^{-15} moles of ATP. Some of the applications may include the indirect measurement of bacteria, yeasts and fungi on surfaces or in products, assaying enzymes that degrade ATP or quantitation of ATP in biological fluids.

Features:

- **Less Variation:** Stable light output.
- **User Friendly:** Easy-to-prepare reagents.
- **Performance:** Fast and convenient assay method.
- **Sensitive:** Detects as little as 10^{-15} moles of ATP.

Storage Conditions: Store at –20°C.

QuantiLum® Recombinant Luciferase

Product	Size Conc.	Cat.#	
QuantiLum® Recombinant Luciferase	1 mg 10–15 mg/ml	E1701	84
	5 mg 10–15 mg/ml	E1702	321

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: QuantiLum® Recombinant Luciferase is a luciferase expressed from a cloned gene from the North American firefly (*Photinus pyralis*) that provides the reliability and dependability needed for performing research or producing kits using bioluminescence reagents to detect ATP or luciferin substrates. A recombinant source eliminates the possibility of seasonal and regional variability that may be found in luciferase purified from natural sources.

Features:

- **Value:** Product available in bulk for large orders to suit individual needs and requirements.
- **Reliable:** Long-term supply assurance.
- **Consistent:** Excellent lot-to-lot consistency.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C. Avoid multiple freeze-thaw cycles.

BacTiter-Glo™ Microbial Cell Viability Assay

Product	Size	Cat.#	
BacTiter-Glo™ Microbial Cell Viability Assay	10 ml	G8230	54
	10 × 10 ml	G8231	322
	100 ml	G8232	286
	10 × 100 ml	G8233	2148
Available Separately	**Size Conc.**	**Cat.#**	
rATP, 10mM	0.5 ml mM	P1132	39

G8230, G8231, G8232, G8233 For Research Use Only. Not for Use in Diagnostic Procedures. P1132 For Laboratory Use.

Description: The BacTiter-Glo™ Microbial Cell Viability Assay is a homogeneous method for determining the number of viable microbial cells in culture based on quantitation of the ATP present. ATP is an indicator of metabolically active cells. The homogeneous assay procedure involves adding a single reagent (BacTiter-Glo™ Reagent) directly to bacterial cells cultured in medium and measuring luminescence. The homogeneous format reduces pipetting errors that may be introduced during the multiple steps required by other methods of ATP measurement. The formulation of the reagent supports bacterial cell lysis and generation of a luminescent signal in a homogeneous add-mix-measure format. The luminescent signal is proportional to the amount of ATP present, which is directly proportional to the number of viable cells in culture. The assay relies on the properties of a proprietary thermostable luciferase (Ultra-Glo™ Recombinant Luciferase) and a proprietary buffer formulation for extracting ATP from bacteria. The assay has been shown to detect a variety of bacteria and fungi.

Features:

- **Simplify Microbial Detection:** The add-mix-measure format reduces the number of handling steps to fewer than that required for similar ATP assays, with no separate lysis step, and no injectors required, allowing easy automation.
- **Get Results Quickly:** Data can be recorded in 5 minutes or less after adding reagent and mixing. Superior sensitivity allows you to detect growth or toxicity quickly after inoculation.
- **Increase Your Sensitivity:** Measure ATP from as few as 10 bacterial cells, 1,000-fold more sensitive than absorbance (O.D.) readings.
- **Choose Your Format:** Can be used with various multiwell-plate or single-use formats. Data can be recorded by luminometer or CCD camera.
- **Process Plates Consecutively:** The "glow-type" luminescent signal is stable, with a half-life generally over 30 minutes.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: For long-term storage, the lyophilized BacTiter-Glo™ Substrate and BacTiter-Glo™ Buffer should be stored at –20°C.

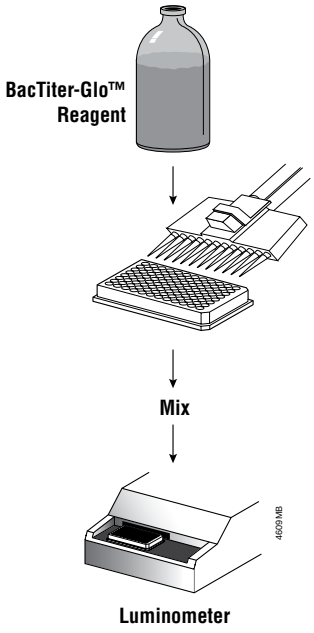
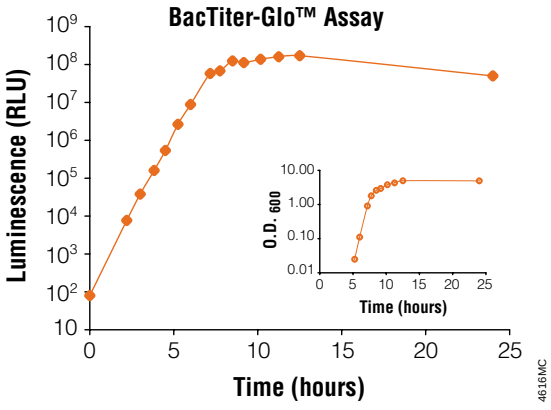


Diagram of the BacTiter-Glo™ Microbial Cell Viability Assay protocol.



Evaluate bacterial growth immediately after inoculation using the BacTiter-Glo™ Assay. When measuring growth by O.D., the first significant measurement (0.25 O.D. with *E. coli*) did not occur until 5 hours after inoculation.

Beetle Luciferin, Potassium Salt

Product	Size	Cat.#	
Beetle Luciferin, Potassium Salt	5 mg	E1601	14
	1 g	E1605	324
	50 mg	E1602	24
	250 mg	E1603	103

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For additional information see page 14.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Protein Deamidation Detection

ISOQUANT® Isoaspartate Detection Kit

Product	Size	Cat.#	
ISOQUANT® Isoaspartate Detection Kit	100 assays	MA1010	1127
Not For Medical Diagnostic Use.			

Description: The ISOQUANT® Isoaspartate Detection Kit is intended for quantitative detection of isoaspartic acid residues in proteins and peptides, which can result from the gradual, nonenzymatic deamidation of asparagine or rearrangement of aspartic acid residues during storage or handling. Because the kit does not depend on the monitoring of charge differences for detection, charge heterogeneity does not interfere with the assay. The ISOQUANT® Kit can be used on peptides or proteins such as monoclonal antibodies.

Features:

- **Great Efficiency:** Simple procedure with a test time of less than one hour. Automation possible with HPLC autosampler capability.
- **Economical:** HPLC detection eliminates cost and inconvenience of radioactive materials handling.
- **Analytical:** Quantitative results available.
- **Versatile:** Perform individual samples or batches. Small sample size makes the assay suitable for research, analytical methods, formulations and process development work.
- **Robust:** Not affected by common buffer components.
- **HPLC Detection Method:** Fits with existing equipment and expertise.
- **Sensitive:** Detects isoaspartate resulting from aspartic acid rearrangement as well as deamidation of asparagine.

Storage Conditions: Store at –20°C.

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Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Luminometers

GloMax® 96 Microplate Luminometer

Product	Size	Cat.#
GloMax® 96 Microplate Luminometer	1 each	E6501
GloMax® 96 Microplate Luminometer w/Single Injector	1 each	E6511
GloMax® 96 Microplate Luminometer w/Dual Injectors	1 each	E6521
Available Separately	**Size**	**Cat.#**
GloMax® Luminometer Light Plate	1 each	E6531
GloMax® 96 Tubing Replacement Kit for Injectors	1 each	E4822
GloMax® Injector Tips Replacement (30)	1 each	E4861
GloMax® 96 Base Instrument Service Agreement	1 each	SA3010
GloMax® Injectors Service Agreement, 1 year	1 each	SA3040
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The GloMax® 96 Microplate Luminometer represents instrumentation and software in a complete solution that includes bioluminescent assays, protocols and support. The GloMax® 96 is a state-of-the-art microplate luminometer that meets the needs for high sensitivity and broad dynamic range for all luminescence applications. Available with up to two reagent injectors, the GloMax® 96 Microplate Luminometer is a versatile system designed to perform both flash- and glow-type luminescence assays. The GloMax® 96 Microplate Luminometer also includes a power cable, data cable, Quick Protocol card, 5 white 96-well microplates, and software required to operate the instrument. This instrument requires the use of a computer with Microsoft Excel®.

The GloMax® 96 Microplate Luminometer provides superior sensitivity and precision for all luminescent assays. Proprietary circuitry and an advanced photon-counting photomultiplier tube (PMT) provide unmatched signal-to-noise ratios. The option of an intelligently designed internal auto-injection system is an added convenience. Connections, priming and flushing are greatly simplified because up to two reagent injectors are designed to fit next to the plate detection module. This arrangement minimizes dispensing problems, simplifies maintenance and reduces service calls. The dispensing design also includes features that help the user save valuable time and reagents, including an open architecture that enables the user to inspect all tubing and tips during operation.

The software features preloaded protocols to run Promega assays. Setup wizards guide the user through a brief process when establishing new protocols. New users can set up protocols and operate the instrument without a steep learning curve. The user can quickly select the protocol of interest and begin running assays with a minimum of modification. Direct-to-Excel-based software reports data directly to an Excel spreadsheet, where data can be analyzed quickly and easily. An Excel macro assists in data analysis for Dual-Luciferase® assays.

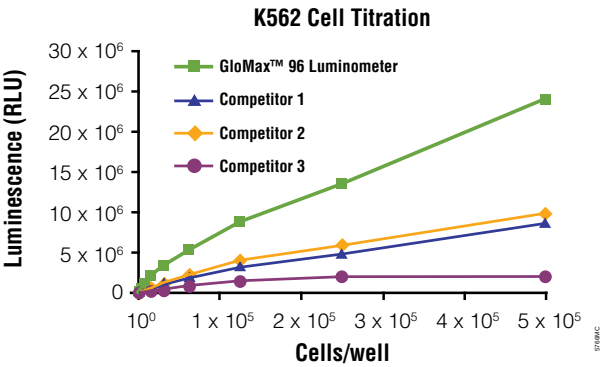
The GloMax® 96 Microplate Luminometer Light Plate provides a quick and easy means to verify the performance of the GloMax® 96 Microplate Luminometer. Users can check the sensitivity, reproducibility and linearity. The Light Plate consists of three highly stable light sources that simulate luminescent samples at signal levels spanning four decades. The unit is powered by a battery that is widely available and easy to replace.

The GloMax® 96 Tubing Replacement Kit for Injectors contains parts for replacement of two complete fluid paths in the GloMax® 96 Microplate Luminometers configured with reagent injectors. Items contained within the kit include two sets of tubing and a pack of 10 injector tips.

Features:

- **High Sensitivity:** Sensitive to approximately 3×10^{-21} moles of luciferase.
- **Wide Dynamic Range:** 9-log dynamic range.
- **Convenient Data Handling:** Direct-to-Excel data importing requires Windows® PC to operate.
- **Simple Data Analysis:** Excel macros allow simple data analysis for Dual-Luciferase® assays.
- Ideal for cell-based assays.
- Engineered to minimize sample cross-talk.

GloMax® 96 Microplate Luminometer.



The GloMax® 96 Microplate Luminometer demonstrates superior operating range compared to leading multifunction readers when using the CellTiter-Glo® Luminescent Cell Viability Assay.

GloMax® 20/20 Luminometer

Product	Size	Cat.#
GloMax® 20/20 Luminometer	1 each	E5311
GloMax® 20/20 Luminometer w/Single Auto-Injector	1 each	E5321
GloMax® 20/20 Luminometer w/Dual Auto-Injector	1 each	E5331
Available Separately	**Size**	**Cat.#**
GloMax® 20/20 Light Standard	1 each	E5341
GloMax® 20/20 Fluorescent Module, UV	1 each	E5351
GloMax® 20/20 Fluorescent Module, Blue	1 each	E5361
GloMax® 20/20 Test Tube Holder (1.5ml Microcentrifuge Tubes)	1 each	E5371
GloMax® 20/20 Replacement Tubing (2), Valves (4), Tips (30)	1 each	E4851
GloMax® 20/20 Replacement Valves	4 sets	E5391
GloMax® 20/20 Replacement Power Supply	1 each	E5411
Thermal Serial Printer and Universal Power Cable	1 each	E2821
Thermal Printer Paper	1 each	E2851
GloMax® 20/20 Base Instrument Service Agreement	1 each	SA3000
GloMax® Injectors Service Agreement, 1 year	1 each	SA3040

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Description: The GloMax® 20/20 Luminometer combines instrumentation and software in a complete solution that includes bioluminescent assays, protocols and support. The GloMax® 20/20 Luminometer is an ultrasensitive, versatile and affordable luminometer designed for use with any Promega bioluminescent assay. The touch screen interface provides comprehensive instrument control and data collection. Optional modules for fluorescence detection provide additional flexibility.

The option of an intelligently designed internal auto-injection system is an added convenience and meets the demands of the Dual-Luciferase® Assay. Software setup wizards guide the user through a brief process when establishing new protocols. New users can set up protocols and operate the instrument without a steep learning curve. Promega protocols are preloaded in the software to help users get started. The user can quickly select the protocol of interest and begin running assays directly to an Excel® spreadsheet, where data can be analyzed quickly and easily.

Features:

- **Ultrasensitive:** Quantitate low-level luminescence samples with confidence.
- **Wide Dynamic Range:** Measure both dim and bright samples without sample dilution.
- **Easy Protocol Setup:** Promega protocols are preloaded for easy implementation.
- **Accessible Injector System:** Completely visible plumbing allows inspection of tubing and tips.
- **Touch Screen Interface:** Simple to operate.
- **Convenient Data Handling:** Record data to a printer in real-time or export data to Excel®.
- **Flexibility:** Options available for up to two auto-injectors to meet your experimental needs.

GloMax® 20/20 Luminometer.

Available in the Helix® on-site stocking system

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Multimode Readers

GloMax®-Multi+ Detection System with Instinct® Software

Product	Size	Cat.#
GloMax®-Multi+ Detection System with Instinct® Software: Base Instrument with Shaking	1 each	E8032
GloMax®-Multi+ Detection System with Instinct® Software: Base Instrument with Heating and Shaking	1 each	E9032
GloMax®-Multi+ Luminescence Module	1 each	E8041
GloMax®-Multi+ Fluorescence Module	1 each	E8051
GloMax®-Multi+ Visible Absorbance Module	1 each	E8061
GloMax®-Multi+ UV-Visible Absorbance Module	1 each	E9061
Available Separately	**Size**	**Cat.#**
GloMax® Injector Tips Replacement (30)	1 each	E4861
GloMax® Luminometer Light Plate	1 each	E6531
Single Injector System for GloMax®-Multi Detection System	1 each	E7071
Dual Injector System for GloMax®-Multi Detection System	1 each	E7081
Cable, USB 2.0 A-B Male	1 each	E8072
DB-15 Communication Cable	1 each	E8081
GloMax®-Multi Optical Kit AFC (also included with Cat.# E7051 or E8051)	1 each	E8917
GloMax®-Multi Optical Kit Blue (also included with Cat.# E7051 or E8051)	1 each	E8921
GloMax®-Multi Optical Kit UV (also included with Cat.# E7051 or E8051)	1 each	E8922
GloMax®-Multi Optical Kit Green (also included with Cat.# E7051 or E8051)	1 each	E8923
GloMax®-Multi Optical Kit Red (also included with Cat.# E7051 or E8051)	1 each	E8924
Injector Inlet Tubing Assembly	1 set	E8925
Injector Outlet Tubing Assembly for Single-Injector System	1 each	E8926
Injector Outlet Tubing Assembly for Dual-Injector System	1 each	E8927
Waste Collection Tray	1 each	E8928
GloMax®-Multi Detection System 490nm Absorbance Filter Set	1 each	E8929
USB Flash Drive, 2.0, 2GB	1 each	E8935
GloMax®-Multi+ Detection System Power Supply-24V, 150W	1 each	E8942
GloMax®-Multi+ Detection System 6-384 Well Plate Adapter	1 each	E8943
GloMax®-Multi+ Detection System 96 Well Optical Crosstalk Mask	1 each	E8944
GloMax®-Multi+ Detection System 384 Well Optical Crosstalk Mask	1 each	E8945
Dust Cover For GloMax®-Multi and GloMax®-Multi+ Instruments	1 each	E3631
GloMax®-Multi+ Base Instrument Service Agreement, 1 year	1 each	SA3030
GloMax® Injectors Service Agreement, 1 year	1 each	SA3040

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Description: The GloMax®-Multi+ Detection System with Instinct® Software combines the superior performance expected from single-mode instruments with the functionality of multiple modes. Detection modes include Fluorescence Intensity, Luminescence and UV-Visible Absorbance. The GloMax®-Multi+ Detection System accepts 6-, 12-, 24-, 48-, 96- and 384-well plates and is configured with a factory-installed shaker that allows for either linear or orbital shaking. The GloMax®-Multi+ Detection System may be purchased with an optional heater allowing precise temperature control from 2°C above ambient temperature to 45°C. The GloMax®-Multi+ Detection System has a touch screen interface with an easy-to-use software program. The Instinct® software puts data analysis capabilities on the touch screen. Label samples and see analyzed data and graphs from the instrument. The protocol composer allows complex protocols to be easily developed by combining multiple technologies into one experiment. In addition, protocols for a variety of Promega and common laboratory assays are pre-installed. The system works alone as a standalone workstation in the laboratory, freeing computing resources from data capture, so more resources can be directed toward other applications.

The GloMax®-Multi+ Detection System with Instinct® Software is made up of a base unit available in two different formats, one with shaking (E8032) and one with heating and shaking (E9032), plus modular detection and functional units, allowing a flexible solution that can be expanded over time. Luminescence, fluorescence and absorbance reading modules are available as well as an optional injector system (used with the luminescence detection module only).

Luminescence Module: An advanced head-on photon-counting photomultiplier tube (PMT) provides unmatched signal-to-noise ratios, beating most standalone luminometers. The luminescence module can detect as little as 3×10^{-21} moles of luciferase, covering a dynamic range over 8 logs. A dual-masking system minimizes well-to-well cross-talk.

Fluorescence Module: Application-optimized Optical Kits simplify fluorescence operation while maximizing performance. Long-lived LED-based excitation lights minimize maintenance and variability in intensity. LED usage increases sensitivity by fully exciting the fluorophore and reducing nonspecific light leakage, a problem often found when using broad-spectrum light sources. **The UV, Blue, Green, Red and AFC Optical Kits are included with the Fluorescence Detection Module.**

- UV (Ex: 365nm, Em: 410–460nm)
- Blue (Ex: 490nm, Em: 510–570nm)
- Green (Ex: 525nm, Em: 580–640nm)
- Red (Ex: 625nm, Em: 660–720nm)
- AFC (Aminofluorocoumarin; Ex: 405nm, Em: 495–505nm)

Visible Absorbance Module: A 6-position filter wheel with 2 open positions ensures flexibility for a wide range of applications. An LED-based visible spectrum light source minimizes maintenance and variability. The Visible Absorbance Module has a reading range of 0–5.0 OD with an accuracy that deviates less than 2%. This module comes with filters for reading 450, 560, 600 and 750nm. A 490nm filter is available as an accessory.

UV-Visible Absorbance Module: This module comes with a 6-position filter wheel that includes filters for measuring 260, 280, 450, 560, 600 and 750nm. These filters accommodate UV DNA and protein quantitation in addition to ELISA and protein assays. Like the Visible Absorbance Module, you can customize the UV-Visible Absorbance Module by substituting a filter of your choice into either of two removable filter paddles.

Operation of the GloMax®-Multi+ Detection System can be performed entirely through the touch screen. Data can be saved on the instrument and moved via the included USB flash drive.

Features:

- **Instinct® Software:** Label samples and see analyzed data and graphs on the touch screen.
- **Measurement Techniques:** Luminescence, fluorescence and UV-Vis absorbance capabilities.
- **Flexible Modular Configuration:** Modular system grows with your needs.
- **Microplate Formats:** Reads 6-, 12-, 24-, 48-, 96- and 384-well plate formats.
- **Factory-Installed Shaker:** Enables shaking in either linear or orbital mode.
- **Optional Heater:** Allows precise temperature control from 2°C above room temperature to 45°C +/– 0.75°C.
- **Dedicated Luminometer Performance:** Sensitive to approximately 3×10^{-21} moles of luciferase with over 8 logs of dynamic range.
- **Multiplex Cell-Based Assays:** Obtain more data from each experiment.
- **Engineered to Minimize Sample Cross-Talk:** Expect reliable results in all read modes.
- **Simple-to-Use Drag-and-Drop Protocol Composer:** Easily develop complex protocols.
- **Convenient, Standalone Operation:** Eliminate bottlenecks and free analysis resources.
- **Injector Systems:** Both single and dual injectors available.

GloMax®-Multi+ Detection System with Instinct® Software.

AuthentiMax™ Software for GloMax®-Multi+

Product	Size	Cat.#
AuthentiMax™ Software for GloMax®-Multi+	1 each	E8946

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: AuthentiMax™ Software for GloMax®-Multi+ is a Microsoft Windows®-based software that supports user authentication and electronic document integrity. The software creates an audit trail while applying electronic signatures to electronic records.

AuthentiMax™ Software is intended for research use but has been designed to include the same technical elements as software used in 21 CFR Part 11 compliant systems so that you can be assured of the integrity of the records generated.

The supplied CD contains AuthentiMax™ Software for GloMax®-Multi+, Technical Manual #TM358 and Microsoft .NET Framework.

Features:

- Authentication and Authorization.
- Document Integrity.
- Audit Trail.
- Electronic Signatures.

GloMax®-Multi+ Installation and Operational Qualification

Product	Size	Cat.#
GloMax®-Multi+ Installation and Operational Qualification	1 each	SA1101
GloMax®-Multi+ Installation Qualification	1 each	SA1102
GloMax®-Multi+ Operational Qualification	1 each	SA1103

Description: The Installation Qualification service product includes a series of formal instrument checks, delivers written documentation of instrument functionality and demonstrates that everything ordered with the instrument is supplied and installed at the customer's laboratory. This service product must be delivered by a Promega representative who is certified to perform the Installation Qualification. The service product involves a site visit to perform:

- Installation by qualified Promega personnel
- Inspection of shipping containers, instrument and accessories
- Comparison of items received against items on the purchase order
- Inspection of laboratory conditions
- Review of all hazards and precautions with users
- Confirmation/installation of correct software version
- Instrument test run
- Documentation of Installation Qualification

The Operational Qualification service product demonstrates that the instrument functions according to its operational specifications. This service product must be delivered by a Promega representative who is certified to perform the Operational Qualification. The service product involves a site visit to:

- Run operational verification tests
- Document all test results
- Train customer(s) to operate the instrument
- Train customer(s) to use the log book
- Complete Operational Qualification documentation

Features:

- **IQ/OQ Documentation:** Documentation of instrument function for lab records. Meets needs for sales and vendors where IQ/OQ is a requirement.
- **QC Worksheet:** Easy to use, no calculation mistakes during OQ process.
- **Plate-Based Instrument Testing:** Easy to use, no chemistry or dilution mistakes.

GloMax®-Multi Jr Single-Tube Multimode Reader

Product	Size	Cat.#
GloMax®-Multi Jr Base Instrument	1 each	E6070
GloMax®-Multi Jr with Luminescence Module	1 each	E6080
Fluorescence Optical Kit, Blue (Ex 460nm, Em 515–570nm)	1 each	E6071
Fluorescence Optical Kit, UV (Ex 365nm, Em 410–450nm)	1 each	E6072
Fluorescence Optical Kit, Green (Ex 525nm, Em 580–640nm)	1 each	E6073
Fluorescence Optical Kit, Red (Ex 625nm, Em 660–725nm)	1 each	E6074
Fluorescence Optical Kit, GFPUV (Ex 365nm, Em 515–570nm)	1 each	E6075
Absorbance Module (User Installable)	1 each	E6076
Absorbance Filter Paddle, 560nm	1 each	E6077
Absorbance Filter Paddle, 600nm	1 each	E6078
Absorbance Filter Paddle, 750nm	1 each	E6079
Available Separately	**Size**	**Cat.#**
GloMax®-Multi Jr Reader Luminescence Module Service Upgrade	1 each	E6098
Minicell Adapter Kit (for measuring 100–200µl of sample)	1 each	E6094
PCR Tube Adapter, GloMax® Multi Jr.	1 each	E6081
Minicell Borosilicate Glass Cuvettes	400 each	E6091
10 × 10mm Square Polystyrene Cuvette (3.5ml capacity)	100 each	E6092
10 × 10mm Square Methacrylate Cuvette (3.5ml capacity)	100 each	E6093
AC Adapter Replacement	1 each	E6095
Thermal Serial Printer and Universal Power Cable	1 each	E2821
Thermal Printer Paper	1 each	E2851
GloMax®-Multi Jr Service Agreement	1 each	SA3080

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Description: The GloMax®-Multi Jr Single-Tube Multimode Reader is designed to provide the utmost flexibility. In addition to high performance, the GloMax®-Multi Jr blends user-friendly operation and a small footprint with flexible purchasing options. The result of this design is an instrument with superior performance that is easy to use, affordable and can be customized to your laboratory's needs.

The GloMax®-Multi Jr with a **Luminescence Module** is designed to deliver performance equivalent to dedicated single-tube luminometers while also offering the flexibility of a multimode reader. The GloMax®-Multi Jr has a sensitivity of 1×10^{-18} moles of luciferase and >5 logs of dynamic range. This dynamic range is more than adequate to cover common luminescence applications, thus reducing the need to dilute samples.

The GloMax®-Multi Jr with a **Fluorescence Module** is designed to deliver both high performance and user flexibility. To achieve high performance, each Fluorescence Module utilizes powerful light-emitting diodes (LEDs) as excitation sources. LED usage increases sensitivity by fully exciting the fluorophore and reducing nonspecific light leakage, a problem often found when using broad-spectrum light sources. Four standard fluorescence optical kits are available for purchase, or contact us to purchase a custom optical kit.

- UV (Ex 365nm, Em 410–450nm)
- Blue (Ex 460nm, Em 515–570nm)
- Green (Ex 525nm, Em 580–640nm)
- Red (Ex 625nm, Em 660–725nm)

The GloMax®-Multi Jr with the **Absorbance Module** provides measurements that are highly sensitive and cover a wide dynamic range. The absorbance channel has a large reading range of 0–4 OD with an accuracy that deviates less than 0.7%.

The GloMax®-Multi Jr has three optional filter paddles with factory-installed filters for measuring 560, 600 and 750nm. These filters accommodate the most common protein assays. Filter paddles can be exchanged easily in seconds. In addition, custom filter paddles can be made readily for nonstandard applications. The GloMax®-Multi Jr is designed to be put into use right from the box without the need to read a manual or obtain special training. To achieve this plug-and-play usability, the GloMax®-Multi Jr combines a color touch screen with an intuitive user interface. The interface makes running samples and viewing data fast and simple while also maintaining the flexibility needed for advanced or custom protocols. The GloMax®-Multi Jr is a modular instrument that fits easily into most budgets. Purchase the technology or modes that you need now, and add on to the system later as your needs expand. For example, the GloMax®-Multi Jr can be purchased as a Luminometer. Then Fluorescence and/or Absorbance Modules can be purchased and added later. There's no service call or downtime. With the modular design, changing technologies is as easy as snapping in a module and restarting the instrument.

Features:

- **Flexible Configuration:** Modular system grows with your needs.
- **Touch Screen Interface:** The user interface has been designed to be intuitive so that no training is required to use the instrument.
- **Easy Protocol Setup:** Promega protocols are preloaded for easy implementation.
- **Convenient Data Handling:** Record data right from the instrument or export data to an Excel® spreadsheet.

GloMax®-Multi Jr Single-Tube Multimode Reader.

Quantus™ Fluorometer

Product	Size	Cat.#
Quantus™ Fluorometer	1 each	E6150

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Quantus™ Fluorometer is a dual-channel fluorometer for your personal quantitation workflow. Designed to provide highly sensitive fluorescent detection when quantifying nucleic acids, the compact instrument is simple to operate. The Quantus™ Fluorometer is optimized with preprogrammed settings for Promega QuantiFluor® Dye Systems (QuantiFluor® dsDNA, RNA and ssDNA Systems) for nucleic acid quantitation, and allows users the flexibility to create their own methods and quantitation settings for other dyes.

The Quantus™ Fluorometer is equipped with two fluorescence channels for nucleic acid and protein quantitation:

- Blue fluorescence channel: Excitation 495nm shortpass (wavelengths up to 495nm), emission 510–580nm.
- Red fluorescence channel: Excitation 640nm shortpass (wavelengths up to 640nm), emission 660–720nm.

Features:

- **High Performance:** Integrated with QuantiFluor® Dyes for high sensitivity, broad dynamic range and target specificity. Great for low-level sample quantitation such as FFPE or viral samples.
- **Increased Sensitivity:** Significantly increased sensitivity over absorbance at 260nm (NanoDrop®) for those samples that are low in concentration. Ten times more sensitive than Qubit® 2.0. A detection limit of 50pg/ml, compared to 500pg/ml for the Qubit® 2.0. With a customized low standard curve, the detection limit can read as low as 1pg/ml.
- **Easy-to-Use Workflow and Navigation:** Flexible with custom protocols and user-defined settings. PC software for data management workflow.
- **Affordable Price:** Cost-effective to easily incorporate into your laboratory.

Quantus™ Fluorometer

QuantiFluor® Single-Tube Fluorometers

Product	Size	Cat.#
QuantiFluor®-ST Handheld Fluorometer with UV/Blue Channels	1 each	E6090
QuantiFluor®-P Handheld Fluorometer with Green/Blue Channels	1 each	E6100
QuantiFluor®-P Handheld Fluorometer with UV/Blue Channels	1 each	E6105
Available Separately	**Size**	**Cat.#**
QuantiFluor®-ST Minicell Adapter Kit (for measuring 50–250µl of sample)	400 each	E6112
QuantiFluor®-ST Solid Standard	1 each	E6113
QuantiFluor®-ST AC Adapter Replacement	1 each	E6096
QuantiFluor®-P Minicell Adapter Kit (for measuring 75–250µl of sample)	400 each	E6111
PCR Tube Adapter, QuantiFluor® Fluorometers	1 each	E6101
Minicell Borosilicate Glass Cuvettes	400 each	E6091
10 × 10mm Square Polystyrene Cuvette (3.5ml capacity)	100 each	E6092
10 × 10mm Square Methacrylate Cuvette (3.5ml capacity)	100 each	E6093
Thermal Serial Printer and Universal Power Cable	1 each	E2821
Thermal Printer Paper	1 each	E2851
QuantiFluor® Service Agreement	1 each	SA3060

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: QuantiFluor® Fluorometers are small, affordable and sensitive, providing easy and accurate fluorescence measurements. Dual-optical design allows an easy switch between assays. High sensitivity and broad dynamic range are designed to meet nucleic acid and protein quantitation assay needs. Simple navigation and single-point calibration make them easy to use.

QuantiFluor®-ST is lab-ready with two built-in channels: UV and Blue.

QuantiFluor®-P is portable and battery-operated with either UV/Blue or Blue/Green configuration.

Features:

- **Easy to Use:** Designed for fast, accurate quantitation.
- **Compact and Cost-Effective:** Save bench space and money with cost-saving, effective instrumentation for quantitation.
- **Flexible:** Quantitate 2ml samples or scale down to <250µl with the optional minicell adapter.

QuantiFluor®-ST and QuantiFluor®-P Single-Tube Fluorometers.

QuantiFluor® Dye Systems

Product	Size	Cat.#
QuantiFluor® dsDNA System	1 ml	E2670
QuantiFluor® ssDNA System	1 ml	E3190
QuantiFluor® RNA System	1 ml	E3310

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The QuantiFluor® dsDNA, ssDNA and RNA Systems enable sensitive quantitation of small amounts of double-stranded DNA (dsDNA), single-stranded DNA (ssDNA) or RNA in solution.

Storage Conditions: Store at –30° to –10°C, protected from light.

Maxwell® 16 Instrument for IVD Use

Maxwell® 16 IVD Instrument

Product	Size	Cat.#	
Maxwell® 16 IVD Instrument	1 each	AS3050	Pls. Enq.
Available Separately	**Size**	**Cat.#**	
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015	295

Description: The Maxwell® 16 IVD Instrument complies with EU Directive 98/79/EC on in vitro diagnostic medical devices and is used in conjunction with the Maxwell® 16 Blood DNA Purification System and Maxwell® 16 Viral Total Nucleic Acid Purification System to purify gDNA from human whole blood, buffy coat, plasma or serum samples.

Features:

- **CE IVD Mark:** Validated for use in clinical diagnostics.
- **Easy to Use:** Simply insert a cartridge, press "Start" and walk away.
- **No Detectable Cross-Contamination:** Improves confidence in results and reduces the likelihood of time-consuming rework and patient risk.
- **Decreases Hands-On Time, Pipetting Errors and Repetitive Motion Injuries:** Improves your laboratory productivity.
- **Quick 30- to 45-Minute Purification:** Add more tests without adding headcount.
- **Consistent High Yield:** Run multiple tests and still have sufficient material for retesting or archiving.
- **Small Benchtop Instrument:** Requires a small amount of precious lab space, so it fits in virtually any lab.
- **Sample Tracking Capability (bar code):** Eliminates sample mixup and integrates into LIMS.
- **UV Light:** Helps cleaning procedures to reduce contamination.

Storage Conditions: Store at 22–25°C.

Maxwell® 16 Viral Total Nucleic Acid Purification System (IVD)

Product	Size	Cat.#	
Maxwell® 16 Viral Total Nucleic Acid Purification System	48 preps	AS1155	302
Available Separately	**Size**	**Cat.#**	
LEV Plungers	50 /pk	AS6101	46
Elution Tubes	50 /pk	AS6201	18
AS6101, AS6201 For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The Maxwell® 16 Viral Total Nucleic Acid Purification System complies with EU Directive 98/79/EC on in vitro diagnostic medical devices and is designed for automated extraction of viral total nucleic acid (RNA and DNA) from serum or plasma using the Maxwell® 16 IVD Instrument. These sample types are commonly processed in molecular microbiology or virology areas of molecular diagnostics. The kit contains all the necessary reagents in a convenient prefilled cartridge format. The simple protocol involves three main steps. First, lysis buffer and proteinase K are mixed to prepare a lysis solution. Second, lysis solution is mixed with sample. Third, the lysate is added into the cartridges. Purified viral total nucleic acids are ready for analysis in approximately 45 minutes.

Features:

- **Purify Across a Range of Virus Titer:** Provides high sensitivity for downstream applications.
- **Single Kit and Protocol for Multiple Sample Types:** Streamlines validation and daily workflow.
- **No Detectable Cross-Contamination:** Reduces time-consuming rework and patient risk.
- **Decreases Hands-On Time, Pipetting Errors and Repetitive Motion Injuries:** Improves lab technician health and safety while increasing consistency of results.

Storage Conditions: Store at 15–30°C.

Maxwell® 16 Blood DNA Purification System (IVD)

Product	Size	Cat.#	
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015	295
Available Separately	**Size**	**Cat.#**	
Elution Buffer, Blood	45 ml	MD1421	50
Plungers	50 /pk	AS5201	Pls. Enq.
Elution Tubes	50 /pk	AS5101	Pls. Enq.
MD1421, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The Maxwell® 16 Blood DNA Purification System (IVD) complies with EU Directive 98/79/EC on in vitro diagnostic medical devices and is used in conjunction with the Maxwell® 16 Clinical Instrument to purify gDNA from human whole blood or buffy coat samples.

Features:

- **CE IVD Mark:** The instrument was validated for use in clinical diagnostics.
- **Easy to Use:** Just put in a cartridge, push a button and walk away.
- **Consistent High Yield:** Run multiple tests and still have sufficient material for retesting or archiving.

Storage Conditions: Store at 15–30°C.

Maxwell® Research Systems

Maxwell® 16 Instrument for Nucleic Acid and Protein Purification

Product	Size	Cat.#
Maxwell® 16 Instrument	1 each	AS2000
Maxwell® 16 MDx Instrument	1 each	AS3000
Available Separately	**Size**	**Cat.#**
Maxwell® 16 SEV Hardware Kit	1 each	AS1200
Maxwell® 16 Cartridge Rack	1 each	AS1201
Maxwell® 16 Magnetic Elution Rack	1 each	AS1202
Maxwell® 16 LEV Hardware Kit	1 each	AS1250
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Maxwell® 16 LEV Magnet	1 each	AS1261
Thermal Serial Printer and Universal Power Cable	1 each	E2821
UV Bulb, Maxwell® 16	1 each	SP1080

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® 16 Instruments provide consistent hands-off, labor-saving automated purification of high-quality DNA, RNA, viral total nucleic acid or recombinant proteins for a broad range of downstream applications. The Maxwell® 16 Instrument can be configured as an SEV Instrument (Standard Elution Volume 200–400µl) for maximum yield or LEV Instrument (Low Elution Volume 30–100µl) for maximum concentration. In addition, SEV and LEV instruments can be configured with the Flexi Method Firmware, allowing the user to program the Maxwell® 16 Instrument to further optimize performance. Your personal automation instrument configuration will be built to order. The Maxwell® 16 Instrument is preprogrammed with purification protocols, which when combined with kits containing prefilled reagent cartridges maximize simplicity and convenience. The instrument processes 1 to 16 samples in approximately 18–50 minutes (depending on sample type).

The Maxwell® 16 Instrument extracts DNA, RNA, viral total nucleic acid or recombinant proteins using paramagnetic particles, allowing optimal capture, washing and elution of the target material. Add samples or lysate directly to the prefilled reagent cartridges, and press start. Optimized reagent systems and automated methods are provided to purify from specified sample types to deliver maximum quality for downstream applications.

The Maxwell® 16 Instrument includes a 1-year basic warranty. Service programs are offered to extend coverage. If during the extended warranty period the instrument needs repair under normal use, Promega will be responsible for the repair. Service programs offer similar terms with the addition of the use of a temporary replacement instrument during the instrument repair period. Please contact Promega for complete warranty and service terms and limits.

Features:

- **Recover Lost Time and Labor:** Automation gives you back your time and labor to complete your work.
- **Gain Confidence in Your Results:** Instrument design, optimized reagents and automated methods provide consistent yield and purity.
- **Improve Your Productivity:** Process up to 16 samples per instrument run in approximately 30–45 minutes.
- **Choose Your Sample Type:** Flexibility to purify from tissue, cells, blood and other samples.

Maxwell® 16 Instrument (Cat.# AS2000).

Maxwell® 16 Instrument (Cat.# AS3000) with optional bar code reader.

Available in the Helix® on-site stocking system

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Maxwell® 16 System DNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV Blood DNA Kit	48 preps	AS1290
Maxwell® 16 FFPE Plus LEV DNA Purification Kit	48 preps	AS1135
Maxwell® 16 Cell LEV DNA Purification Kit	48 preps	AS1140
Maxwell® 16 Buccal Swab LEV DNA Purification Kit	48 preps	AS1295
Maxwell® 16 Viral Total Nucleic Acid Purification Kit	48 preps	AS1150
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit	48 preps	AS1130
Standard Elution Volume (SEV)		
Maxwell® 16 Blood DNA Purification Kit	48 preps	AS1010
Maxwell® 16 Cell DNA Purification Kit	48 preps	AS1020
Maxwell® 16 Tissue DNA Purification Kit	48 preps	AS1030
Maxwell® 16 Mouse Tail DNA Purification Kit	48 preps	AS1120
Available Separately		
LEV Plungers	50 /pk	AS6101
Elution Tubes (LEV)	50 /pk	AS6201
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
Elution Buffer, Blood	45 ml	MD1421
Plungers (SEV)	50 /pk	AS5201
Elution Tubes (SEV)	50 /pk	AS5101

AS1290, AS1135, AS1140, AS1295, AS1150, AS1010, AS1020, AS1030, AS1120 For Laboratory Use. AS6101, AS6201, V1231, V4741, MD1421, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures.

Maxwell® 16 System RNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV simplyRNA Cells Kit	48 preps	AS1270
Maxwell® 16 LEV simplyRNA Blood Kit	48 preps	AS1310
Maxwell® 16 LEV simplyRNA Tissue Kit	48 preps	AS1280
Maxwell® 16 Tissue LEV Total RNA Purification Kit	48 preps	AS1220
Maxwell® 16 Cell LEV Total RNA Purification Kit	48 preps	AS1225
Maxwell® 16 Viral Total Nucleic Acid Purification Kit	48 preps	AS1150
Standard Elution Volume (SEV)		
Maxwell® 16 Total RNA Purification Kit	48 preps	AS1050
Available Separately		
Maxwell® 16 High Strength LEV Magnetic Rod and Plunger Bar Adaptor	1 each	SP1070
LEV Plungers	50 /pk	AS6101
Elution Tubes (LEV)	50 /pk	AS6201
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Plungers (SEV)	50 /pk	AS5201
Elution Tubes (SEV)	50 /pk	AS5101

AS1270, AS1280, AS1220, AS1225, AS1150, AS1050 For Laboratory Use. AS1310, SP1070, AS6101, AS6201, AS1251, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures.

Maxwell® 16 Forensic Instrument

Product	Size	Cat.#
Maxwell® 16 Forensic Instrument	1 each	AS3060
Available Separately	**Size**	**Cat.#**
Maxwell® 16 SEV Hardware Kit	1 each	AS1200
Maxwell® 16 Cartridge Rack	1 each	AS1201
Maxwell® 16 Magnetic Elution Rack	1 each	AS1202
Maxwell® 16 LEV Hardware Kit	1 each	AS1250
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Maxwell® 16 LEV Magnet	1 each	AS1261
Thermal Serial Printer and Universal Power Cable	1 each	E2821
UV Bulb, Maxwell® 16	1 each	SP1080

AS1200, AS1201, AS1202, AS1250, AS1251, AS1261, E2821, SP1080 For Research Use Only. Not for Use in Diagnostic Procedures. AS3060 Not For Medical Diagnostic Use.

Description: The Maxwell® 16 Forensic Instrument provides easy-to-use, consistent and reliable automated nucleic acid extraction of 1 to 16 samples, bar-code sample tracking, a touch-screen interface and UV decontamination. The AS3060 instrument packages include the bar-code reader, UV light and Maxwell® Sample Track Software. You choose either low elution volume (50–100µl, LEV) or standard elution volume (300–400µl, SEV) format. Run report data can be transferred from the Maxwell® 16 Forensic Instrument to a PC or an external printer. Data transferred to a PC can be uploaded to a laboratory information management system (LIMS).

Features:

- **Fast, Hands-Free Purification:** Improves workflow, and allows staff to perform other value-added tasks.
- **Consistent, Reliable Performance:** Less rework and more confidence in results.
- **Ease of Use:** Yields immediate productivity gains with minimal operator training.
- **Small Size:** Takes up less room on the lab bench. Fits inside biosafety cabinet or hood.
- **Bar-Code Sample Tracking Capability:** Eliminates sample mixup, and data can be integrated into LIMS.
- **UV Light:** Helps decontamination.

Maxwell® 16 Forensic Instrument.

Maxwell® 16 Flexi Method Firmware

Product	Size	Cat.#
Maxwell® 16 Flexi Method Firmware	1 each	AS6411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Certain sample types present unique challenges for DNA, RNA or recombinant protein extraction. The Maxwell® 16 Flexi Method Firmware provides the flexibility and control to modify or create automated methods for the Maxwell® 16 Instrument. You have the ability to optimize multiple instrument parameters to tailor instrument operation to your unique needs. It's Personal Automation™ just the way you want it. The Maxwell® 16 Flexi Method Firmware allows users to change 5 key instrument operating parameters:

- Lysis time
- Binding
- Drying
- Elution
- Paramagnetic particle capture

You program the Maxwell® 16 Instrument by following on-screen prompts and entering changes through the instrument keypad; no external PC or programming knowledge is required. User-defined optimized methods are as easy to use as pushing the Start button. The Flexi Method Firmware also allows you to save and password-protect your unique methods. Make and save changes as you define the key instrument operating parameters that impact your successful results.

The Flexi Method Firmware can be installed on existing AS1000 and AS2000 Maxwell® 16 Instruments by purchasing the AS6411 CD-ROM, which contains the Firmware, installation software and Technical Manual. Flexi Method Firmware ordered with the purchase of a new AS2000 Instrument will be installed at the factory.

Features:

- **Achieve Confidence in your Results:** You control operation of key instrument operating parameters.
- **Address Key Unanswered Questions:** Flexibilty gives you the ability to optimize Maxwell® 16 operation to your sample and scientific needs.
- **Spend More Time Generating Data:** Follow simple on-screen prompts to program instrument from the keypad. Press Run to start.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Maxwell® 16 Service and Support Products

Product	Size	Cat.#
Maxwell® 16 Premier Warranty	1 each	SA2000
Maxwell® 16 Standard Service Agreement	1 each	SA2010
Maxwell® 16 Premier Service Agreement	1 each	SA2015
Maxwell® 16 Preventative Maintenance	1 each	SA2020
Maxwell® 16 Installation Qualification	1 each	SA1001
Maxwell® 16 Operational Qualification	1 each	SA1011
Maxwell® 16 Installation and Operational Qualification	1 each	SA1021

SA2000, SA2010, SA2015, SA2020 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Two warranty levels are available at the time of purchase, allowing you to customize your support solution. The **Standard Warranty**, included in the system price and valid for 1 year, covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. The loaner will be shipped via standard ground shipment and will arrive in 5 to 7 working days. We will repair your instrument and return it to you performing to original factory specifications.

The **Premier Warranty** (SA2000) is an upgrade to the Standard Warranty, is valid until the end of the Standard Warranty period and covers all parts, labor and shipping to and from our depot repair location as well as your choice of a loaner instrument within 1 working day or on-site repair by a factory-trained service technician. We will repair your instrument and return it to you performing to original factory specifications. It also includes one preventive maintenance visit.

After the warranty period is over, you can continue to receive the same comprehensive service and support as you did when your system was under warranty. The **Standard Service Agreement** (SA2010) covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. The loaner will be shipped via standard ground shipment and will arrive in 5 to 7 working days. If your Maxwell® 16 Instrument needs repair, we will provide a box for shipment of the instrument back to our service facility. We will repair it and return it to you performing to original factory specifications.

The **Premier Service Agreement** (SA2015) includes all parts, labor and shipping to and from our depot repair location as well as your choice of a loaner instrument within 1 working day or on-site repair by a factory-trained service technician. You can utilize our depot repair and receive a loaner instrument in one working day or you can elect to have one of our service technicians service it in your lab. Additionally, it includes one annual preventive maintenance visit per year.

In order to keep the system operating at peak performance, Promega recommends that Maxwell® 16 Instruments receive a **Preventive Maintenance** (SA2020) check after 12 months of use. During this procedure, our qualified service personnel test the instrument, check parts for wear and replace them as needed. Additionally, the system is aligned and performance is verified. Documentation for your files is provided. The preventive maintenance service is performed by returning the instrument to the factory.

The **Installation Qualification** (SA1001) provides a series of formal on-site instrument checks, delivers written documentation of instrument functionality, and demonstrates that everything ordered with your instrument is supplied and installed in your laboratory. Upon delivery to the lab, the instrument and its components will be visually inspected and reviewed for completeness. Following the inspection, the instrument will be powered on to confirm that the system is properly functional.

The **Operational Qualification** (SA1011) demonstrates that the Maxwell® 16 will function according to its operational specifications. An instrument specialist will check the instrument's alignment and then perform an operational test run to ensure that all of the hardware modules function correctly. Following the documentation of these tests, familiarization training with the instrument's operators will occur. The specialist will also explain all of the sections of the instrument log book.

The **Installation and Operational Qualification** package (SA1021) includes all of the components from both SA1001 and SA1011 in one service product.

Features:

- **Multiple Options to Meet Your Needs:** Allows you to select the warranty coverage or service agreement that best meets the needs of your lab.
- **Factory-Trained Specialists:** Ensures your instrument is repaired quickly and effectively.
- **Expert Technical Service:** Promega experts can help you solve problems quickly.
- **Fixed-Cost Service Products:** Predictable support expenditures.
- **Ongoing System Documentation:** Allows audit tracing and compliance.
- **Comprehensive Service and Support:** Makes certain there is minimal instrument downtime.

HSM 2.0 Instrument

HSM 2.0 Instrument

Product	Size	Cat.#
HSM 2.0 Instrument	1 each	A2715
Available Separately	**Size**	**Cat.#**
HSM 2.0 Instrument Cover	1 each	A2712
ReliaPrep™ Large Volume HT gDNA Isolation System	96 × 10ml to 960 × 1ml preps	A1751
HSM 2.0 Tube Rack	1 each	A2713
HSM 2.0 Tube Rack Stand	1 each	A2714
HSM 2.0 Instrument 1-Year Service Agreement	1 each	SA1330
ReliaPrep™ LV 32 HSM Standard Service Agreement	1 each	SA3070

A2712, A2715, A1751, A2713, A2714, SA3070 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Heater Shaker Magnet Instrument (HSM 2.0) is designed to perform all of the functions necessary for the processing of magnetic resin-based purification chemistries in large-volume formats. With its ability to heat, shake and apply a magnetic field, the HSM 2.0 Instrument provides all-in-one processing capabilities for a variety of large-volume purification chemistries in either a manual or automated format. The instrument uses standard 50ml conical tubes, magnets and reagent-based paramagnetic particles (PMPs). The PMPs provide a mobile solid phase that optimizes capture, washing and elution of biological target molecules.

Initially designed to run the ReliaPrep™ Large Volume HT gDNA Isolation System (Cat.# A1751), the HSM 2.0 Instrument is supplied with software containing preprogrammed isolation methods for processing up to 32 samples of human whole blood in approximately 2–3.5 hours, depending on sample volume and number. Samples are processed in a semi-automated method with the user dispensing and aspirating reagents from the samples as directed by the software on a computer screen. The programmed methods control the heating, shaking, magnetization and timing of the steps required for the semi-automated purification. For fully automated purification, the HSM 2.0 Instrument can be integrated with a robotic liquid-handling workstation, which can process 32 samples in less than 4.5 hours.

Minimum Software Computer Requirements:

Windows® PC

Dual-Core x86-based processor, 2MB Memory, 100GB HD, Video 1024 × 768

Microsoft Windows® 7 Professional and Ultimate editions (32-bit or 64-bit)

Use of up-to-date antivirus software is strongly recommended.

11277TA

Power Supply, HSM 2.0 Instrument and Tube Rack on Tube Rack Stand (from left to right).

Available in the Helix® on-site stocking system

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Promega

Perfect Partnership of Assays and Instruments

Multimode microplate reader for luminescence, fluorescence, absorbance, BRET and FRET studies

Integrated with Promega assays:
Developed, optimized and preloaded with Promega assay protocols for seamless workflow.

Superior performance:
Broader dynamic range, better sensitivity, and lower well-to-well cross talk for more usable data.

Easy to Use:
Tablet PC-controlled, with full PC capability and intuitive graphical user interface navigation.

Connected:
Use as a standalone instrument or integrate into your high-throughput automated workflow. Export data to your laboratory network.

GloMax DISCOVER

Available in 2014
Request a demonstration or pricing today:
www.promega.com/GloMaxDiscover

14 Molecular Diagnostics

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Maxwell® 16 Instrument for IVD Use

Maxwell® 16 IVD Instrument

Product	Size	Cat.#	
Maxwell® 16 IVD Instrument	1 each	AS3050	Pls. Enq.
Available Separately	**Size**	**Cat.#**	
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015	295

Description: The Maxwell® 16 IVD Instrument complies with EU Directive 98/79/EC on in vitro diagnostic medical devices and is used in conjunction with the Maxwell® 16 Blood DNA Purification System and Maxwell® 16 Viral Total Nucleic Acid Purification System to purify gDNA from human whole blood, buffy coat, plasma or serum samples.

Features:

- **CE IVD Mark:** Validated for use in clinical diagnostics.
- **Easy to Use:** Simply insert a cartridge, press "Start" and walk away.
- **No Detectable Cross-Contamination:** Improves confidence in results and reduces the likelihood of time-consuming rework and patient risk.
- **Decreases Hands-On Time, Pipetting Errors and Repetitive Motion Injuries:** Improves your laboratory productivity.
- **Quick 30- to 45-Minute Purification:** Add more tests without adding headcount.
- **Consistent High Yield:** Run multiple tests and still have sufficient material for retesting or archiving.
- **Small Benchtop Instrument:** Requires a small amount of precious lab space, so it fits in virtually any lab.
- **Sample Tracking Capability (bar code):** Eliminates sample mixup and integrates into LIMS.
- **UV Light:** Helps cleaning procedures to reduce contamination.

Storage Conditions: Store at 22–25°C.

Maxwell® 16 Viral Total Nucleic Acid Purification System (IVD)

Product	Size	Cat.#	
Maxwell® 16 Viral Total Nucleic Acid Purification System	48 preps	AS1155	302
Available Separately	**Size**	**Cat.#**	
LEV Plungers	50 /pk	AS6101	46
Elution Tubes	50 /pk	AS6201	18
AS6101, AS6201 For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The Maxwell® 16 Viral Total Nucleic Acid Purification System complies with EU Directive 98/79/EC on in vitro diagnostic medical devices and is designed for automated extraction of viral total nucleic acid (RNA and DNA) from serum or plasma using the Maxwell® 16 IVD Instrument. These sample types are commonly processed in molecular microbiology or virology areas of molecular diagnostics. The kit contains all the necessary reagents in a convenient prefilled cartridge format. The simple protocol involves three main steps. First, lysis buffer and proteinase K are mixed to prepare a lysis solution. Second, lysis solution is mixed with sample. Third, the lysate is added into the cartridges. Purified viral total nucleic acids are ready for analysis in approximately 45 minutes.

Features:

- **Purify Across a Range of Virus Titer:** Provides high sensitivity for downstream applications.
- **Single Kit and Protocol for Multiple Sample Types:** Streamlines validation and daily workflow.
- **No Detectable Cross-Contamination:** Reduces time-consuming rework and patient risk.
- **Decreases Hands-On Time, Pipetting Errors and Repetitive Motion Injuries:** Improves lab technician health and safety while increasing consistency of results.

Storage Conditions: Store at 15–30°C.

Maxwell® 16 Blood DNA Purification System (IVD)

Product	Size	Cat.#	
Maxwell® 16 Blood DNA Purification System (IVD)	48 preps	AS1015	295
Available Separately	**Size**	**Cat.#**	
Elution Buffer, Blood	45 ml	MD1421	50
Plungers	50 /pk	AS5201	Pls. Enq.
Elution Tubes	50 /pk	AS5101	Pls. Enq.
MD1421, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The Maxwell® 16 Blood DNA Purification System (IVD) complies with EU Directive 98/79/EC on in vitro diagnostic medical devices and is used in conjunction with the Maxwell® 16 Clinical Instrument to purify gDNA from human whole blood or buffy coat samples.

Features:

- **CE IVD Mark:** The instrument was validated for use in clinical diagnostics.
- **Easy to Use:** Just put in a cartridge, push a button and walk away.
- **Consistent High Yield:** Run multiple tests and still have sufficient material for retesting or archiving.

Storage Conditions: Store at 15–30°C.

Maxwell® Research Systems

Maxwell® 16 Instrument for Nucleic Acid and Protein Purification

Product	Size	Cat.#
Maxwell® 16 Instrument	1 each	AS2000
Maxwell® 16 MDx Instrument	1 each	AS3000
Available Separately	**Size**	**Cat.#**
Maxwell® 16 SEV Hardware Kit	1 each	AS1200
Maxwell® 16 Cartridge Rack	1 each	AS1201
Maxwell® 16 Magnetic Elution Rack	1 each	AS1202
Maxwell® 16 LEV Hardware Kit	1 each	AS1250
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Maxwell® 16 LEV Magnet	1 each	AS1261
Thermal Serial Printer and Universal Power Cable	1 each	E2821
UV Bulb, Maxwell® 16	1 each	SP1080

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® 16 Instruments provide consistent hands-off, labor-saving automated purification of high-quality DNA, RNA, viral total nucleic acid or recombinant proteins for a broad range of downstream applications. The Maxwell® 16 Instrument can be configured as an SEV Instrument (Standard Elution Volume 200–400µl) for maximum yield or LEV Instrument (Low Elution Volume 30–100µl) for maximum concentration. In addition, SEV and LEV instruments can be configured with the Flexi Method Firmware, allowing the user to program the Maxwell® 16 Instrument to further optimize performance. Your personal automation instrument configuration will be built to order. The Maxwell® 16 Instrument is preprogrammed with purification protocols, which when combined with kits containing prefilled reagent cartridges maximize simplicity and convenience. The instrument processes 1 to 16 samples in approximately 18–50 minutes (depending on sample type).

The Maxwell® 16 Instrument extracts DNA, RNA, viral total nucleic acid or recombinant proteins using paramagnetic particles, allowing optimal capture, washing and elution of the target material. Add samples or lysate directly to the prefilled reagent cartridges, and press start. Optimized reagent systems and automated methods are provided to purify from specified sample types to deliver maximum quality for downstream applications.

The Maxwell® 16 Instrument includes a 1-year basic warranty. Service programs are offered to extend coverage. If during the extended warranty period the instrument needs repair under normal use, Promega will be responsible for the repair. Service programs offer similar terms with the addition of the use of a temporary replacement instrument during the instrument repair period. Please contact Promega for complete warranty and service terms and limits.

Features:

- **Recover Lost Time and Labor:** Automation gives you back your time and labor to complete your work.
- **Gain Confidence in Your Results:** Instrument design, optimized reagents and automated methods provide consistent yield and purity.
- **Improve Your Productivity:** Process up to 16 samples per instrument run in approximately 30–45 minutes.
- **Choose Your Sample Type:** Flexibility to purify from tissue, cells, blood and other samples.

Maxwell® 16 Instrument (Cat.# AS2000).

Maxwell® 16 Instrument (Cat.# AS3000) with optional bar code reader.

Available in the Helix® on-site stocking system

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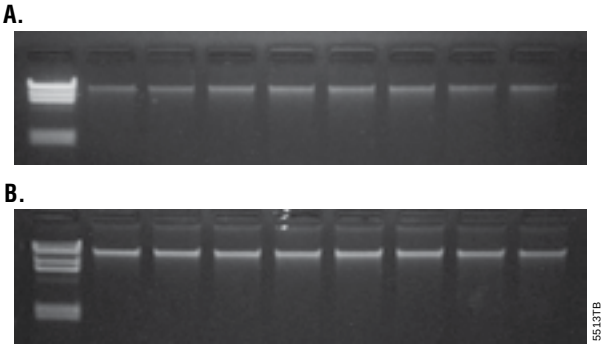
Maxwell® 16 System DNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV Blood DNA Kit	48 preps	AS1290
Maxwell® 16 FFPE Plus LEV DNA Purification Kit	48 preps	AS1135
Maxwell® 16 Cell LEV DNA Purification Kit	48 preps	AS1140
Maxwell® 16 Buccal Swab LEV DNA Purification Kit	48 preps	AS1295
Maxwell® 16 Viral Total Nucleic Acid Purification Kit	48 preps	AS1150
Maxwell® 16 FFPE Tissue LEV DNA Purification Kit	48 preps	AS1130
Standard Elution Volume (SEV)		
Maxwell® 16 Blood DNA Purification Kit	48 preps	AS1010
Maxwell® 16 Cell DNA Purification Kit	48 preps	AS1020
Maxwell® 16 Tissue DNA Purification Kit	48 preps	AS1030
Maxwell® 16 Mouse Tail DNA Purification Kit	48 preps	AS1120
Available Separately		
LEV Plungers	50 /pk	AS6101
Elution Tubes (LEV)	50 /pk	AS6201
Microtubes, 1.5ml	1,000 /bag	V1231
ClickFit Microtube, 1.5ml	1,000 /pack	V4741
Elution Buffer, Blood	45 ml	MD1421
Plungers (SEV)	50 /pk	AS5201
Elution Tubes (SEV)	50 /pk	AS5101

AS1290, AS1135, AS1140, AS1295, AS1150, AS1010, AS1020, AS1030, AS1120 For Laboratory Use. AS6101, AS6201, V1231, V4741, MD1421, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures.



Genomic DNA purified from 8 samples of 200µl of whole human blood (Panel A) and 8 samples of 1cm of mouse tail (Panel B) was visualized on a 1% agarose gel stained with ethidium bromide. Lane L, Lambda DNA/HindIII Markers (Cat.# G1711); Lanes 1–8, 5µl of purified genomic DNA.

DNA Yields from Various Starting Materials.

Sample Type	Sample Size	Yield
Whole blood	200µl	4–9µg (>3pg/white blood cell)
Whole blood	400µl	8–15µg (>3pg/white blood cell)
Mouse tail	1.2cm	20µg
Animal tissue	20–25mg	60–100µg (mouse liver)
Tissue culture cells	5×10^6	10µg (HeLa)
Gram– bacteria	2×10^9	10µg (BL21)
Gram+ bacteria	2×10^9	1µg (*B. cereus*)
Plant leaf (tomato)	25mg	10µg

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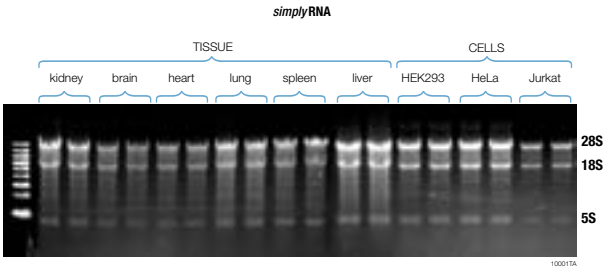
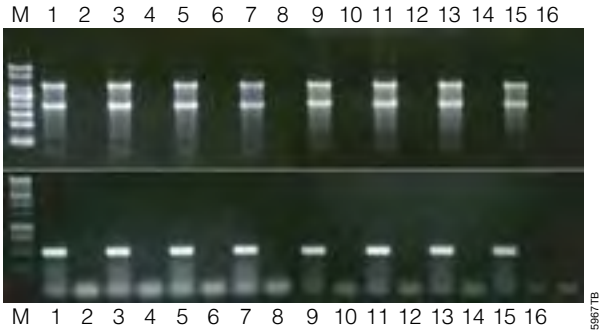
Maxwell® 16 System RNA Purification Kits

Product	Size	Cat.#
Low Elution Volume (LEV)		
Maxwell® 16 LEV simplyRNA Cells Kit	48 preps	AS1270
Maxwell® 16 LEV simplyRNA Blood Kit	48 preps	AS1310
Maxwell® 16 LEV simplyRNA Tissue Kit	48 preps	AS1280
Maxwell® 16 Tissue LEV Total RNA Purification Kit	48 preps	AS1220
Maxwell® 16 Cell LEV Total RNA Purification Kit	48 preps	AS1225
Maxwell® 16 Viral Total Nucleic Acid Purification Kit	48 preps	AS1150
Standard Elution Volume (SEV)		
Maxwell® 16 Total RNA Purification Kit	48 preps	AS1050
Available Separately		
Maxwell® 16 High Strength LEV Magnetic Rod and Plunger Bar Adaptor	1 each	SP1070
LEV Plungers	50 /pk	AS6101
Elution Tubes (LEV)	50 /pk	AS6201
Maxwell® 16 LEV Cartridge Rack	1 each	AS1251
Plungers (SEV)	50 /pk	AS5201
Elution Tubes (SEV)	50 /pk	AS5101

AS1270, AS1280, AS1220, AS1225, AS1150, AS1050 For Laboratory Use. AS1310, SP1070, AS6101, AS6201, AS1251, AS5201, AS5101 For Research Use Only. Not for Use in Diagnostic Procedures.



Intact RNA extracted from tissue using the Maxwell® 16 LEV simplyRNA Tissue Kit. Extracted tissue samples were run on a FlashGel® System for 5 minutes and signal developed for 15 minutes. The 28S, 18S and 5S are clearly visible indicating intact RNA.



No detectable cross-contamination. Sixteen purification reactions were performed using an input of 25mg of mouse liver lysate (odd lanes) or SV RNA Lysis Buffer alone (even lanes). **Panel A.** Four-microliter aliquots of each purified sample were resolved by 1.2% agarose gel electrophoresis under denaturing conditions. Lane M, RNA Markers (Cat.# G3191). **Panel B.** Equivalent volumes (1µl) of each sample were amplified by endpoint RT-PCR using a primer pair specific for a portion of beta actin RNA. A total of five microliters of each amplification reaction was analyzed by 1.2% agarose gel electrophoresis and visualized by ethidium bromide staining. Lane M, 1kb DNA Ladder (Cat.# G5711).

Maxwell® 16 Flexi Method Firmware

Product	Size	Cat.#
Maxwell® 16 Flexi Method Firmware	1 each	AS6411
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Certain sample types present unique challenges for DNA, RNA or recombinant protein extraction. The Maxwell® 16 Flexi Method Firmware provides the flexibility and control to modify or create automated methods for the Maxwell® 16 Instrument. You have the ability to optimize multiple instrument parameters to tailor instrument operation to your unique needs. It's Personal Automation™ just the way you want it. The Maxwell® 16 Flexi Method Firmware allows users to change 5 key instrument operating parameters:

- Lysis time
- Binding
- Drying
- Elution
- Paramagnetic particle capture

You program the Maxwell® 16 Instrument by following on-screen prompts and entering changes through the instrument keypad; no external PC or programming knowledge is required. User-defined optimized methods are as easy to use as pushing the Start button. The Flexi Method Firmware also allows you to save and password-protect your unique methods. Make and save changes as you define the key instrument operating parameters that impact your successful results.

The Flexi Method Firmware can be installed on existing AS1000 and AS2000 Maxwell® 16 Instruments by purchasing the AS6411 CD-ROM, which contains the Firmware, installation software and Technical Manual. Flexi Method Firmware ordered with the purchase of a new AS2000 Instrument will be installed at the factory.

Features:

- **Achieve Confidence in your Results:** You control operation of key instrument operating parameters.
- **Address Key Unanswered Questions:** Flexibilty gives you the ability to optimize Maxwell® 16 operation to your sample and scientific needs.
- **Spend More Time Generating Data:** Follow simple on-screen prompts to program instrument from the keypad. Press Run to start.

Maxwell® 16 Service and Support Products

Product	Size	Cat.#
Maxwell® 16 Premier Warranty	1 each	SA2000
Maxwell® 16 Standard Service Agreement	1 each	SA2010
Maxwell® 16 Premier Service Agreement	1 each	SA2015
Maxwell® 16 Preventative Maintenance	1 each	SA2020
Maxwell® 16 Installation Qualification	1 each	SA1001
Maxwell® 16 Operational Qualification	1 each	SA1011
Maxwell® 16 Installation and Operational Qualification	1 each	SA1021
SA2000, SA2010, SA2015, SA2020 For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Two warranty levels are available at the time of purchase, allowing you to customize your support solution. The **Standard Warranty**, included in the system price and valid for 1 year, covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. The loaner will be shipped via standard ground shipment and will arrive in 5 to 7 working days. We will repair your instrument and return it to you performing to original factory specifications.

The **Premier Warranty** (SA2000) is an upgrade to the Standard Warranty, is valid until the end of the Standard Warranty period and covers all parts, labor and shipping to and from our depot repair location as well as your choice of a loaner instrument within 1 working day or on-site repair by a factory-trained service technician. We will repair your instrument and return it to you performing to original factory specifications. It also includes one preventive maintenance visit.

After the warranty period is over, you can continue to receive the same comprehensive service and support as you did when your system was under warranty. The **Standard Service Agreement** (SA2010) covers all parts, labor and shipping to and from our depot repair location as well as a loaner instrument upon request. The loaner will be shipped via standard ground shipment and will arrive in 5 to 7 working days. If your Maxwell® 16 Instrument needs repair, we will provide a box for shipment of the instrument back to our service facility. We will repair it and return it to you performing to original factory specifications.

The **Premier Service Agreement** (SA2015) includes all parts, labor and shipping to and from our depot repair location as well as your choice of a loaner instrument within 1 working day or on-site repair by a factory-trained service technician. You can utilize our depot repair and receive a loaner instrument in one working day or you can elect to have one of our service technicians service it in your lab. Additionally, it includes one annual preventive maintenance visit per year.

In order to keep the system operating at peak performance, Promega recommends that Maxwell® 16 Instruments receive a **Preventive Maintenance** (SA2020) check after 12 months of use. During this procedure, our qualified service personnel test the instrument, check parts for wear and replace them as needed. Additionally, the system is aligned and performance is verified. Documentation for your files is provided. The preventive maintenance service is performed by returning the instrument to the factory.

The **Installation Qualification** (SA1001) provides a series of formal on-site instrument checks, delivers written documentation of instrument functionality, and demonstrates that everything ordered with your instrument is supplied and installed in your laboratory. Upon delivery to the lab, the instrument and its components will be visually inspected and reviewed for completeness. Following the inspection, the instrument will be powered on to confirm that the system is properly functional.

The **Operational Qualification** (SA1011) demonstrates that the Maxwell® 16 will function according to its operational specifications. An instrument specialist will check the instrument's alignment and then perform an operational test run to ensure that all of the hardware modules function correctly. Following the documentation of these tests, familiarization training with the instrument's operators will occur. The specialist will also explain all of the sections of the instrument log book.

The **Installation and Operational Qualification** package (SA1021) includes all of the components from both SA1001 and SA1011 in one service product.

Features:

- **Multiple Options to Meet Your Needs:** Allows you to select the warranty coverage or service agreement that best meets the needs of your lab.
- **Factory-Trained Specialists:** Ensures your instrument is repaired quickly and effectively.
- **Expert Technical Service:** Promega experts can help you solve problems quickly.
- **Fixed-Cost Service Products:** Predictable support expenditures.
- **Ongoing System Documentation:** Allows audit tracing and compliance.
- **Comprehensive Service and Support:** Makes certain there is minimal instrument downtime.

Available in the Helix® on-site stocking system

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Reagents for Molecular Diagnostics Labs

GoTaq® MDx Hot Start Polymerase

Product	Size	Cat.#
GoTaq® MDx Hot Start Polymerase	100 u	D6001
	500 u	D6005
	2,500 u	D6006
	10,000 u	D6008

For Laboratory Use.

Description: GoTaq® MDx Hot Start Polymerase contains the high-performance GoTaq® DNA Polymerase bound to a proprietary antibody that blocks polymerase activity. The polymerase activity is restored during the initial denaturation step when the amplification reactions are heated at 94–95°C for two minutes. The system is supplied with a tube of 25mM $MgCl_2$, allowing optimization of the magnesium concentration in your reactions. It is also supplied with 5X Green GoTaq® Flexi Buffer and 5X Colorless GoTaq® Flexi Buffer. The buffers contain a compound that increases sample density, so that samples sink easily into the wells of an agarose gel. The green buffer also contains two dyes (yellow and blue) that separate to allow easy monitoring during electrophoresis. Use the green reaction buffer for direct-to-gel analysis after amplification and the colorless reaction buffer for amplifications where the dyes may interfere with post-amplification analysis such as fluorescence or absorbance testing.

GoTaq® MDx Hot Start Polymerase is a general purpose reagent that can be used for clinical applications or as a component of molecular diagnostic assays without paying royalties. The products by themselves do not provide any diagnostic result.

Features:

- **Easy:** Convenient handling with room temperature setup.
- **Fast:** Results with only two-minute enzyme activation.
- **Enhanced:** Yield, sensitivity and specificity with an antibody hot start.
- **Ready:** High-quality product developed for integration into Laboratory Developed Tests and homebrew assays.

To use GoTaq® MDx Hot Start Polymerase in a custom format for diagnostic assays or to distribute GoTaq® MDx Hot Start Polymerase, please contact the Promega Custom Order Department to discuss specific requirements.

Storage Conditions: Store at –30 to –10°C.

GoScript™ Reverse Transcriptase

Product	Size	Cat.#
GoScript™ Reverse Transcriptase	100 reactions	A5003
	500 reactions	A5004

For Laboratory Use.

Description: GoScript™ Reverse Transcriptase utilizes M-MLV and state-of-the-art buffer technology designed for qPCR to deliver robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors. GoScript™ Reverse Transcriptase is qualified for use in qPCR, including GoTaq® qPCR and Plexor® qPCR systems for performing RT-qPCR.

Features:

- **Ultra-Active:** Save money on every reaction.
- **Sensitive:** Detect rare transcripts.
- **Processive:** Transcribe long messages.
- **Resilient:** Synthesize cDNA in the presence of strong inhibitors.

Storage Conditions: Store at –20°C.

GoScript™ Reverse Transcription System

Product	Size	Cat.#
GoScript™ Reverse Transcription System	50 reactions	A5000
	100 reactions	A5001

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 274.

Deoxynucleotide Triphosphates (dNTPs)

Product	Size Conc.	Cat.#
dATP	25 µmol 100 mM	U1205
	40 µmol 100 mM	U1201
	200 µmol 100 mM	U1202
dGTP	25 µmol 100 mM	U1215
	40 µmol 100 mM	U1211
	200 µmol 100 mM	U1212
dCTP	25 µmol 100 mM	U1225
	40 µmol 100 mM	U1221
	200 µmol 100 mM	U1222
dTTP	25 µmol 100 mM	U1235
	40 µmol 100 mM	U1231
	200 µmol 100 mM	U1232
Set of dATP, dCTP, dGTP, dTTP	10µmol each 100 mM	U1330
	25 µmol each 100 mM	U1420
	40µmol each 100 mM	U1240
	200 µmol 100 mM	U1410

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dNTPs are >99% pure, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease-of-use in PCR and other applications.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –30°C to –10°C. Avoid exposure to frequent temperature changes.

PCR Amplifications From Each Size of Individual dNTPs.
Each catalog number supplies each individual dNTP at 100mM. Reactions are based on 200µM each dNTP in a 50µl reaction.

Cat.#	Quantity	Volume	Reactions
U1330, U1335	10 µmol each	100 µl each	1,000
U1420	25 µmol each	250 µl each	2,500
U1240, U1245	40 µmol each	400 µl each	4,000
U1410	200 µmol each	2 × 1,000 µl each	20,000

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dNTP Mix

Product	Size Conc.	Cat.#
dNTP Mix	200 µl 10 mM	U1511
	1,000 µl 10 mM	U1515

For Laboratory Use.

Description: dNTP Mix is a premixed solution containing sodium salts of dATP, dCTP, dGTP and dTTP, each at 10mM in water at pH 7.5; the total concentration of nucleotides is 40mM. One microliter of the dNTP Mix in a 50µl reaction will give a final dNTP concentration of 200µM for each dNTP.

Features:

- **High Purity:** dNTPs are >98% pure.
- **Easy to Use:** Reduced pipetting steps contribute to ease-of-use and reduce the risk of contamination.

Storage Conditions: Store at –20°C. Avoid exposure to frequent temperature changes.

Nuclease-Free Water

Product	Size	Cat.#
Nuclease-Free Water	50 ml	P1193
	150 ml	P1195

P1193 For Laboratory Use. P1195 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Nuclease-Free Water is an essential component of molecular biology experiments.

Features:

- **Quality Tested:** Each lot of Nuclease-Free Water is tested and certified to be free of DNase and RNase activity.

Storage Conditions: Store at <30°C.

Recombinant RNasin® Ribonuclease Inhibitor

Product	Size Conc.	Cat.#
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2511
	10,000 u 20–40 u/µl	N2515

For Laboratory Use.

For additional information see page 130.

Native RNasin® Ribonuclease Inhibitor

Product	Size Conc.	Cat.#
RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2111
	10,000 u 20–40 u/µl	N2115
Recombinant RNasin® Ribonuclease Inhibitor	2,500 u 20–40 u/µl	N2511
	10,000 u 20–40 u/µl	N2515

N2111, N2115 For Research Use Only. Not for Use in Diagnostic Procedures. N2511, N2515 For Laboratory Use.

For additional information see page 130.

Available in the Helix® on-site stocking system

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Systems for Molecular Diagnostics Research

Microsatellite Instability (MSI) Analysis

Product	Size	Cat.#
MSI Analysis System, Version 1.2	100 reactions	MD1641
Available Separately	**Size**	**Cat.#**
Internal Lane Standard 600	150 µl	DG1071

DG1071 For Laboratory Use. MD1641 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MSI Analysis System, Version 1.2, is a fluorescent multiplex PCR-based method detect microsatellite instability (MSI), a form of genomic instability. This instability is due to insertion or deletion of repeating units during DNA replication and failure of the mismatch repair system (MMR) to correct these errors. MSI analysis typically involves comparing allelic profiles of microsatellite markers generated by amplification from matching pairs of test samples, which may be MMR-deficient, and normal tissue samples. New alleles in the abnormal sample not found in the corresponding normal sample indicate the presence of MSI. MSI analysis can be used as a screening method to identify samples for further characterization.

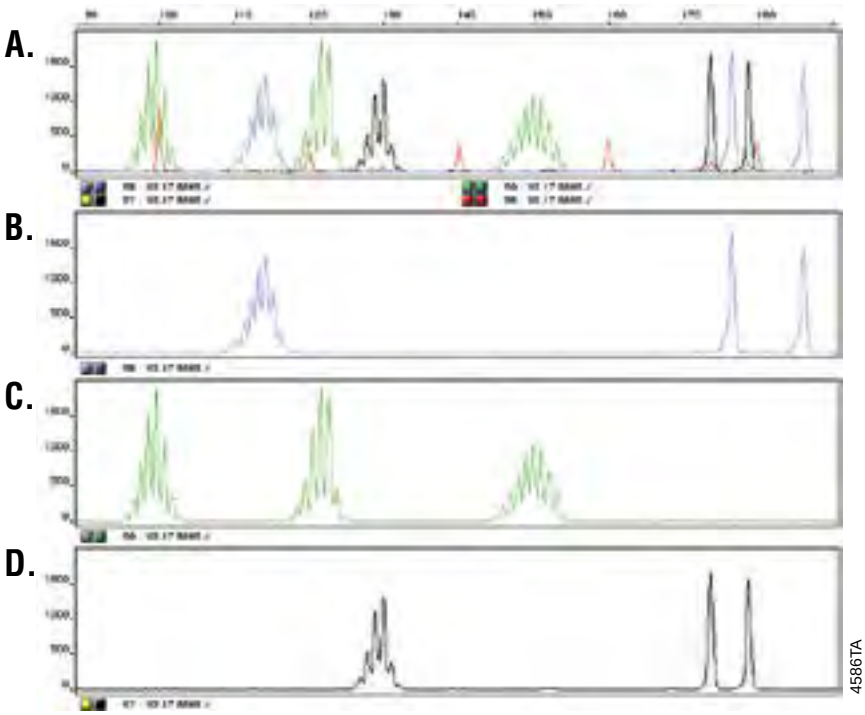
The MSI Analysis System, Version 1.2, includes fluorescently labeled primers (marker panel) for co-amplification of seven markers for analysis of the MSI-high (MSI-H) phenotype, including five nearly monomorphic mononucleotide repeat markers (BAT-25, BAT-26, MONO-27, NR-21 and NR-24) and two highly polymorphic pentanucleotide repeat markers (Penta C and Penta D). Amplified fragments are detected using an ABI PRISM® 310, 3100, 3100-*Avant*, 3130 or 3130*xl* Genetic Analyzer after spectral calibration.

Panels and bins text files simplify and standardize data analysis by providing automated assignment of genotypes using GeneMapper® 4.0 software.

Features:

- **Understand the Complete MSI Phenotype:** A single multiplex PCR amplifies five informative mononucleotide repeat markers for MSI-H determination.
- **Confidence in Sample Identification:** Co-amplification of highly polymorphic pentanucleotide repeats provides internal sample tracking.
- **Consistent Data Analysis:** MSI Panels and bins for GeneMapper® software can be downloaded.

Storage Conditions: Store at –20°C.



Analysis of MSI phenotype.

Y Chromosome Deletion Detection System, Version 2.0

Product	Size	Cat.#
Y Chromosome Deletion Detection System, Version 2.0	25 reactions	MD1531

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Y Chromosome Deletion Detection System, Version 2.0, provides a standardized screening panel amplifying only informative nonpolymorphic sequence tag sites (STS) on the human Y chromosome. The system amplifies key functional regions associated with AZoospermia Factor (AZF), namely the regions that flank AZFa and cover AZFb, AZFc, AZFd including *DAZ, KAL-Y, SMCY* and flanking loci for other key spermatogenesis-related genes (namely *RBM1, DFFRY* and *DBY*).

Five Multiplex Master Mixes, with a total of 20 characterized Y-specific primer pairs, are included. Four of the multiplex primer sets contain a control primer pair that amplifies a fragment of the X-linked *SMCX* locus. One of the multiplex primer sets (Multiplex E Master Mix) contains a control primer pair that amplifies a unique region in both male and female DNA (ZFX/ZFY). Finally, a primer pair that amplifies a region of the SRY gene has been included in Multiplex E Master Mix as a control for the testis-determining factor on the short arm of the Y chromosome to detect XX males arising from Y to X translocations.

The Multiplex Master Mixes are designed to facilitate the simultaneous amplification of several different regions of the Y chromosome. The amplification products (83–496bp) of the five multiplex PCR amplifications can be clearly separated by agarose gel electrophoresis and visualized by ethidium bromide staining.

Failure to amplify specific regions of the Y chromosome is indicative of Y chromosome deletions in the test sample. The size control ladder provided minimizes analysis time and the possibility of misinterpreting molecular weight of amplification products.

Features:

- **Ease of Use:** Premixed Multiplex Master Mixes contain 20 primer pairs, including internal controls providing a standardized panel of results requiring no user optimization.
- **More Robust Reactions:** Improved formulation and use of GoTaq® DNA Polymerase minimizes dropouts.
- **Flexibility:** Amplify genomic DNA purified using various methods and with a PE480 (oil overlay) or PE9600/9700 (non-oil overlay) thermal cycler.
- **Complete System:** All required reagents are provided in the kit.

Storage Conditions: Store at –20°C.

Primer Sets in the Y Chromosome Deletion Detection System.

Multiplex	Locus/ STS 1	Locus/ STS 2	Locus/ STS 3	Locus/ STS 4	Locus/ STS 5
Master Mix A	*DAZ*/ SY254	DYS240/ SY157	DYS271/ SY81	DYS221/ SY130	*KAL-Y*/ SY182
Master Mix B	*SMCY*/ SYPR3	DYS218/ SY127	*DAZ*/ SY242		*DAZ*/ SY208
Master Mix C	DYS219/ SY128	DYS212/ SY121	DYF51S1/ SY145	*DAZ*/ SY255	
Master Mix D	DYS236/ SY152	DYS223/ SY133		DYS215/ SY124	
Master Mix E	SRY/ SY14	DYS224/ SY134	DYS148/ SY86	DYS273/ SY84	ZFX1/ ZFY

9492LA

CE-Marked In Vitro Diagnostic Medical Device—Y Chromosome AZF Analysis

Product	Size	Cat.#
Y Chromosome AZF Analysis System	25 reactions	MD1631

Description: The Y Chromosome AZF Analysis System complies with EU Directive 98/79/EC on in vitro diagnostic medical devices. The Y Chromosome AZF Analysis System provides a multiplex PCR-based method to analyze the integrity of the human Y chromosome AZF region. The Y Chromosome AZF Analysis System is to be used as part of a diagnostic workup to characterize male infertility. This information is potentially useful for patients considering in vitro fertilization because deletions in the AZF region of the Y chromosome are passed on to male offspring produced by in vitro fertilization, resulting in infertility.

The Y Chromosome AZF Analysis System consists of 20 primer pairs that are homologous to previously identified and mapped sequence-tagged sites (STS). These primers will amplify nonpolymorphic short DNA segments from the AZF region of the Y chromosome, covering AZFa, AZFb, AZFc, proximal AZFc/AZFd (including DAZ, KALY and SMCY) and flanking loci for other key spermatogenesis-related genes (RBM1, DFFRY and DBY). The Y Chromosome AZF Analysis System is fully compliant with European Molecular Genetics Quality Network (EMQN) recommendations.

The primers have been combined into five Multiplex Master Mix sets (A–E) for use in multiplex PCR. This makes it possible to analyze all 20 STS by performing five concurrent PCR amplifications.

Features:

- **Compliant with EU Directive 98/79/EC:** Y Chromosome AZF Analysis System is labeled as an in vitro diagnostic medical device and bears the CE Mark.
- **State-of-the-Art Detection of First Choice STS:** Primer pairs are compliant with current EMQN recommendations and include primer pairs to amplify SRY.
- **Single Amplification:** Saves time and labor with simultaneous amplification of 5 multiplex reactions, which analyzes the extent of Y chromosome integrity.
- **Complete System:** Optimized premixed Multiplex Master Mixes, including control primers to test for PCR amplification, provide a standardized panel of results.

Storage Conditions: Store all components at –20°C. Avoid multiple freeze-thaw cycles.

Available in the Helix® on-site stocking system
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Available in the Helix® on-site stocking system

15 PCR

Hot-Start PCR

GoTaq® G2 Hot Start Polymerase

Product	Size	Cat.#
GoTaq® G2 Hot Start Polymerase	100 u	M7401
	500 u	M7405
	2,500 u	M7406
	10,000 u	M7408
GoTaq® G2 Hot Start Green Master Mix	100 reactions	M7422
	1,000 reactions	M7423
GoTaq® G2 Hot Start Colorless Master Mix	100 reactions	M7432
	1,000 reactions	M7433

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: GoTaq® G2 Polymerase is the second generation of GoTaq® products. The enzyme comes in a variety of formats designed to provide maximum flexibility, control and convenience.

For superior convenience and improved yield, sensitivity and specificity, choose GoTaq® G2 Hot Start Polymerase, which is bound to a proprietary antibody that blocks activity. Activity is restored during initial denaturation, allowing hot-start PCR. Available as a master mix or standalone enzyme.

GoTaq® G2 Hot Start Polymerase is supplied with 5X Green GoTaq® Flexi Buffer, 5X Colorless GoTaq® Flexi Buffer and 25mM $MgCl_2$. The high-performance GoTaq® G2 DNA Polymerase is bound to a proprietary antibody that blocks polymerase activity. Polymerase activity is restored during the initial denaturation step, when amplification reactions are heated at 94–95°C for 2 minutes, allowing hot-start PCR in which polymerase activity is inhibited at temperatures below 70°C for convenient, room-temperature reaction setup. Hot-start PCR is advantageous for some amplification targets because it may eliminate or minimize primer-dimer and nonspecific products. In some cases, hot-start PCR may improve yields. GoTaq® G2 Hot Start Polymerase exhibits 5′→3′ exonuclease activity.

The **GoTaq® G2 Hot Start Master Mixes** are ready-to-use mixes containing all necessary PCR components (GoTaq® G2 Hot Start Polymerase, buffer, dNTPs and optimized magnesium)—researcher only needs to add primer and template and go!

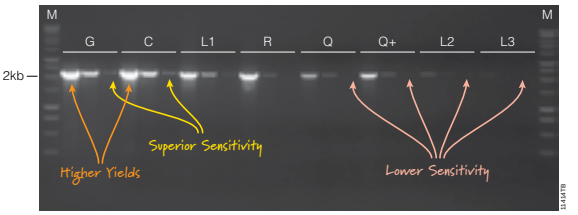
The GoTaq® G2 Hot Start Green Master Mix also contains a gel loading dye to facilitate downstream gel analysis. The GoTaq® G2 Hot Start Colorless Master Mix contains no gel loading dye for use when downstream applications require fluorescence or absorbance readings without purification.

Features:

Robust reliable PCR for all your amplification needs.

- Simplify reaction setup and save time with a ready-to-use master mix.
- Prepare your reaction at room temperature, not on ice.
- Eliminate nonspecific amplification with hot-start enzyme.
- Use at no risk—backed by our PCR Satisfaction Guarantee.

Storage Conditions: Store at –30°C to –10°C.



GoTaq® G2 Hot Start Polymerase exhibits higher yield and greater detection sensitivity than competitors. The 2.2kb APC target was amplified from decreasing amounts of input gDNA (33ng, 3.3ng and 330pg, left to right for each enzyme) using the GoTaq® G2 Hot Start Polymerase with Green (G) and Colorless (C) buffers and the leading competitors' enzymes (L1, R, Q, Q+, L2 and L3) according to manufacturers' recommendations.

GoTaq® Hot Start Polymerase

Product	Size	Cat.#
GoTaq® Hot Start Polymerase	100 u	M5001
	500 u	M5005
	2,500 u	M5006
	10,000 u	M5008
GoTaq® Hot Start Green Master Mix	100 reactions	M5122
	1,000 reactions	M5123
GoTaq® Hot Start Colorless Master Mix	100 reactions	M5132
	1,000 reactions	M5133

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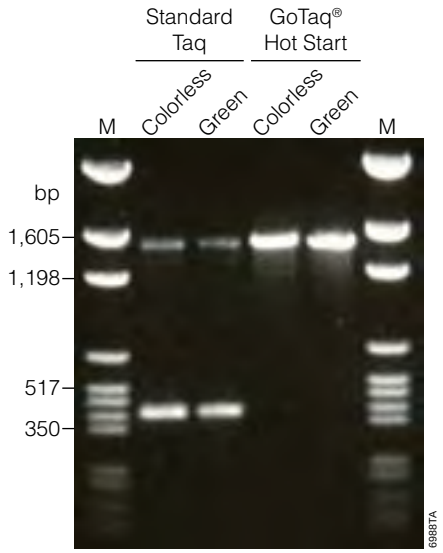
Description: GoTaq® Hot Start Polymerase contains the high-performance GoTaq® DNA Polymerase bound to a proprietary antibody that blocks polymerase activity. The polymerase activity is restored during the initial denaturation step when the amplification reactions are heated at 94–95°C for 2 minutes. This enables hot-start PCR, where polymerase activity is eliminated or minimized at temperatures below 70°C. GoTaq® Hot Start Polymerase exhibits 5′→3′ exonuclease activity. The system is supplied with the 5X Green GoTaq® Flexi Buffer, 5X Colorless GoTaq® Flexi Buffer and a tube of 25mM $MgCl_2$, allowing optimization of the magnesium concentration in your reactions. The buffers contain a compound that increases sample density so that samples sink easily into wells of an agarose gel. The green buffer also contains two dyes (yellow and blue) that separate to allow easy monitoring during electrophoresis. Use the green reaction buffer for direct-to-gel analysis after amplification and the colorless reaction buffer for amplifications where the dyes may interfere with post-amplification analysis such as fluorescence or absorbance testing.

GoTaq® Hot Start Master Mixes are premixed, ready-to-use solutions containing GoTaq® Hot Start Polymerase, magnesium, dNTPs and buffer. Reactions can be set up in less than a minute at room temperature; simply add your template, water and primers. These mixes are available with either green or colorless reaction buffers, which also serve as loading buffers, allowing you to go directly from thermal cycler to gel analysis. GoTaq® Hot Start Master Mixes offer the specificity and sensitivity of an antibody-based hot-start polymerase in a convenient, easy-to-use, time-saving format.

Features:

- **Enhanced Yield, Sensitivity and Specificity:** The proven, robust amplification and sensitivity of GoTaq® DNA Polymerase now with built-in hot start to deliver even more superior results.
- **Ease of Use:** Set up your reaction at room temperature—no need to set up on ice.
- **Higher Yield:** Two-minute activation saves time and ensures maximum enzyme activity.
- **Higher Specificity:** Minimize nonspecific amplification and primer-dimers.
- **Improved Productivity:** Go directly from PCR to gel analysis. Green GoTaq® Reaction Buffer serves as both reaction buffer and gel loading solution.
- **Convenience:** One tube, one pipetting step. Only add template and primers when using the master mixes.
- **Optimization:** Control the magnesium concentration in your reaction for specialized templates when using the standalone polymerase.

Storage Conditions: Store at –30°C to –10°C.



Improve amplification of targets that require hot start using GoTaq® Hot Start Polymerase. A 1.5kb fragment of a *Corynephage* omega gene that requires hot-start PCR was amplified from 500pg of plasmid DNA using either standard *Taq* or GoTaq® Hot Start Polymerase in Green and Colorless GoTaq® Flexi Reaction Buffers. Use of GoTaq® Hot Start Polymerase resulted in amplification of only the target 1.5kb fragment. Using standard *Taq* DNA Polymerase, a nonspecific 410bp product also was amplified.

Long PCR

GoTaq® Long PCR Master Mix

Product	Size	Cat.#
GoTaq® Long PCR Master Mix	100 reactions	M4021
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: GoTaq® Long PCR Master Mix contains the high-performance GoTaq® Hot Start Polymerase in a specially formulated mixture with a proprietary thermostable proofreading polymerase. This optimized enzyme mixture allows efficient amplification of up to 40kb from lambda DNA or 30kb from human genomic DNA. The presence of a proofreading enzyme to repair DNA mismatches and a highly processive polymerase allows the polymerase to continue to elongate the DNA much further, resulting in longer DNA amplification.

The optimized formulation of the GoTaq® Long PCR Master Mix components enables simple reaction setup and provides consistently efficient, accurate and robust amplification of long DNA amplicons.

Features:

The proven robust amplification using GoTaq® DNA Polymerase is now available for long-range PCR (up to 30kb gDNA).

- **Easy:** Hot-start master mix for convenient handling and simple setup.
- **Enhanced:** Yield, sensitivity and specificity with optimized components.
- **Accurate:** Blend of thermostable DNA polymerases with enhanced processivity and proofreading.
- **Confident:** Control primer pair and human gDNA template to perform control reactions and test template quality.
- **Efficient:** Perfect for cloning genes, mutational analysis and DNA sequencing.

Storage Conditions: Upon arrival, store all components at –30°C to –10°C, protected from light. For immediate use, components may be stored at 2–8°C, protected from light, for up to 3 months.

Available in the Helix® on-site stocking system

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Routine PCR

GoTaq® G2 Polymerase

Product	Size	Cat.#
GoTaq® G2 Flexi DNA Polymerase	100 u	M7801
	500 u	M7805
	2,500 u	M7806
	10,000 u	M7808
GoTaq® G2 DNA Polymerase	100 u	M7841
	500 u	M7845
	2,500 u	M7848

For Laboratory Use.

Description: GoTaq® G2 Polymerase is the second generation of GoTaq® products. The enzyme comes in a variety of formats designed to provide maximum flexibility, control and convenience.

For robust, routine PCR choose from a standalone enzyme and buffer system with or without magnesium.

GoTaq® G2 DNA Polymerase is supplied with 5X Green GoTaq® Reaction Buffer and 5X Colorless GoTaq® Reaction Buffer. Both buffers contain $MgCl_2$ at a concentration of 7.5mM for a final concentration of 1.5mM in the 1X reaction.

GoTaq® G2 Flexi DNA Polymerase is supplied with 5X Green GoTaq® Flexi Buffer and 5X Colorless GoTaq® Flexi Buffer and 25mM $MgCl_2$.

The GoTaq® G2 and Flexi DNA Polymerases are supplied in a proprietary formulation containing 50% glycerol with buffers designed for enhanced amplification. The enzyme is a full-length form of *Taq* DNA polymerase that exhibits 5′→3′ exonuclease activity.

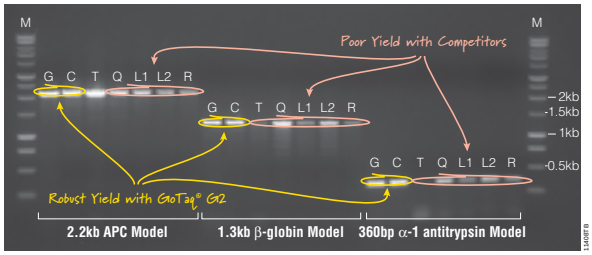
The 5X Green GoTaq® Reaction and Flexi Buffers contain two dyes (blue and yellow) that separate during electrophoresis to indicate migration progress. The colorless buffer is used when direct fluorescence or absorbance readings are required without prior purification of the amplified DNA from the PCR.

Features:

Robust, Reliable Amplification

- Direct-to-gel amplification buffer.
- Two buffer systems available to match your needs:
- Reaction buffer with $MgCl_2$ to simplify reaction setup.
- Flexi buffer and separate $MgCl_2$ to enable optimization.
- No risk: Backed by the Promega PCR Satisfaction Guarantee.

Storage Conditions: Store at –30°C to –10°C.



GoTaq® G2 DNA Polymerase consistently produces high yields across multiple targets, while competitors' enzymes produce highly variable results. Three different targets were amplified with the GoTaq® G2 DNA Polymerase Green (G) and Colorless (C) buffers or competitor products (T, Q, L1, L2 and R) according to manufacturers' recommended protocols using 3.3ng of input human DNA.

GoTaq® Reaction Buffers and Magnesium Chloride

Product	Size	Conc.	Cat.#
5X Green GoTaq® Reaction Buffer	20 ml		M7911
5X Colorless GoTaq® Reaction Buffer	20 ml		M7921
5X Colorless GoTaq® Flexi Reaction Buffer	20 ml		M8901
5X Green GoTaq® Flexi Reaction Buffer	20 ml		M8911
Magnesium Chloride Solution	1.5 ml	25 mM	A3511
	25 ml	25 mM	A3513

For Laboratory Use.

Description: The 5X Green GoTaq® Reaction Buffer contains two dyes (a blue dye and a yellow dye) that separate during electrophoresis to show migration progress. The buffer also contains a compound that increases sample density. This means that samples can be loaded directly onto gels without the need for loading dye. The blue dye migrates at the same rate as a 3–5kb DNA fragment in a 1% agarose gel. The yellow dye migrates at a rate faster than primers (<50bp) in a 1% agarose gel. The 5X Colorless GoTaq® Reaction Buffer has the same formulation as the 5X Green GoTaq® Reaction Buffer but does not contain dyes and is recommended for any applications where absorbance or fluorescence measurements are necessary prior to PCR cleanup. Both buffers are supplied at pH 8.5.

Cat.# M7911 and M7921 contain $MgCl_2$ at a concentration of 7.5mM, giving a final concentration of 1.5mM in the 1X reaction. Cat.# M8901 and M8911 do not contain magnesium.

Storage Conditions: Store at –30°C to –10°C.

PCR Master Mix

Product	Size	Conc.	Cat.#
PCR Master Mix	10 reactions	2 X	M7501
	100 reactions	2 X	M7502
	1,000 reactions	2 X	M7505

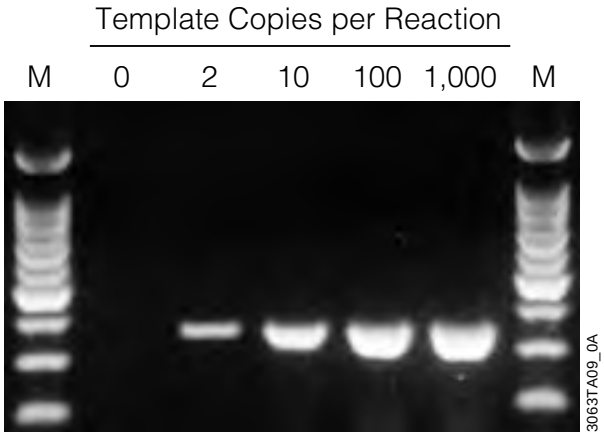
For Laboratory Use.

Description: PCR Master Mix is a premixed, ready-to-use solution containing *Taq* DNA polymerase, dNTPs, $MgCl_2$ and reaction buffers at optimal concentrations for efficient amplification of DNA templates by PCR. The PCR Master Mix is optimized for use in routine PCR for amplifying DNA templates in the range of 0.2–2kb.

Features:

- **Fast:** Set up reactions in less than a minute.
- **Sensitive:** Amplify as little as 2 copies of target template.
- **Convenient:** One tube, one pipetting step.
- **Complete:** Reagents, including *Taq* DNA polymerase, $MgCl_2$, dNTPs and buffers, in one tube.
- **Scalable:** Set up 10µl, 25µl or 50µl reactions.
- **Stable:** Store at 4°C for up to 3 months.
- **Performance Guaranteed:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.
- **Flexible:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C. PCR Master Mix can be stored at 4°C for up to 3 months.



Detection of low-copy-number templates using PCR Master Mix. Use of PCR Master Mix to detect low number of copies of the α-1-antitrypsin gene. PCR was performed on Human Genomic DNA (Cat.# G3041) using primers targeting a 360bp fragment of the α-1-antitrypsin gene (single copy per genome). Lane M, 100bp DNA Ladder (Cat.# G2101).

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Tfl DNA Polymerase

Product	Size	Conc.	Cat.#
Tfl DNA Polymerase	100 u	5 u/µl	M1941
	1,000 u	5 u/µl	M1945

For Laboratory Use.

Description: *Tfl* DNA Polymerase is a thermostable enzyme of approximately 94kDa isolated from *Thermus flavus*. The enzyme replicates DNA at 74°C and exhibits a half-life of 40 minutes at 95°C. *Tfl* DNA Polymerase catalyzes the polymerization of nucleotides into duplex DNA in the 5′→3′ direction in the presence of magnesium and the polymerization of nucleotides into DNA using an RNA template in the 5′→3′ direction in the presence of manganese. The enzyme also possesses a 5′→3′ exonuclease activity. *Tfl* DNA Polymerase is recommended for use in PCR and primer extension reactions at elevated temperatures.

***Tfl* DNA Polymerase 10X Reaction Buffer:** 200mM Tris-acetate (pH 8.9 at 25°C), 100mM ammonium sulfate.

Magnesium Sulfate: 25mM $MgSO_4$ Solution included.

Features:

- **Flexibility:** Provided with a 10X Reaction Buffer that does not contain magnesium. Sufficient 25mM $MgSO_4$ is provided separately to allow optimization of enzyme performance under different conditions.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Store at –20°C.

Pfu DNA Polymerase

Product	Size	Conc.	Cat.#
Pfu DNA Polymerase	100 u	2–3 u/µl	M7741
	500 u	2–3 u/µl	M7745

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: *Pfu* DNA Polymerase is a thermostable enzyme of approximately 90kDa isolated from *Pyrococcus furiosus*. The enzyme replicates DNA at 75°C, catalyzing the polymerization of nucleotides into duplex DNA in the 5′→3′ direction in the presence of magnesium. *Pfu* DNA Polymerase also possesses 3′→5′ exonuclease (proofreading) activity. Base misinsertions that may occur during polymerization are rapidly excised by the proofreading activity of the polymerase. Consequently, *Pfu* DNA Polymerase is recommended for use in PCR and primer extension reactions that require high-fidelity synthesis. *Pfu* DNA Polymerase-generated PCR fragments are blunt-ended.

Pfu DNA Polymerase 10X Reaction Buffer with $MgSO_4$: 200mM Tris-HCl (pH 8.8 at 25°C), 100mM KCl, 100mM $(NH_4)_2SO_4$, 20mM $MgSO_4$, 1.0% Triton® X-100 and 1mg/ml nuclease-free BSA.

Features:

- **High Fidelity:** *Pfu* DNA Polymerase exhibits the lowest error rate of any thermostable DNA polymerase.
- **Complete:** Provided with 10X buffer containing 20mM $MgSO_4$.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Store at –20°C.

PCR Nucleotide Mix

Product	Size	Conc.	Cat.#
PCR Nucleotide Mix	200 µl	10 mM	C1141
	1,000 µl	10 mM	C1145

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for PCR success. The PCR Nucleotide Mix is a premixed solution containing the sodium salts of dATP, dCTP, dGTP and dTTP, each at a concentration of 10mM in water at pH 7.5; the total concentration of nucleotides is 40mM. This solution is ready to use and is optimized for standard PCRs and specialty approaches including hot-start and reverse transcription PCR (RT-PCR). One microliter (1µl) is sufficient for amplification in a typical 50µl reaction volume.

Features:

- **Optimized and Pretested in PCR:** Equimolar amounts of each dNTP ensure optimal PCR.
- **Convenient:** Add 1µl for 50µl PCR.
- **Easy to Use:** Reduced pipetting steps contribute to ease of use and reduce the risk of contamination.
- **Performance Guaranteed:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.
- **Flexible:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C. Avoid exposure to frequent temperature changes.

dNTP Mix

Product	Size	Conc.	Cat.#
dNTP Mix	200 µl	10 mM	U1511
	1,000 µl	10 mM	U1515

For Laboratory Use.

Description: dNTP Mix is a premixed solution containing sodium salts of dATP, dCTP, dGTP and dTTP, each at 10mM in water at pH 7.5; the total concentration of nucleotides is 40mM. One microliter of the dNTP Mix in a 50µl reaction will give a final dNTP concentration of 200µM for each dNTP.

Features:

- **High Purity:** dNTPs are >98% pure.
- **Ease of Use:** Reduced pipetting steps contribute to ease of use and reduce the risk of contamination.

Storage Conditions: Store at –20°C. Avoid exposure to frequent temperature changes.

Deoxynucleotide Triphosphates (dNTPs)

Product	Size	Conc.	Cat.#
dATP	25 µmol	100 mM	U1205
	40 µmol	100 mM	U1201
	200 µmol	100 mM	U1202
dGTP	25 µmol	100 mM	U1215
	40 µmol	100 mM	U1211
	200 µmol	100 mM	U1212
dCTP	25 µmol	100 mM	U1225
	40 µmol	100 mM	U1221
	200 µmol	100 mM	U1222
dTTP	25 µmol	100 mM	U1235
	40 µmol	100 mM	U1231
	200 µmol	100 mM	U1232
Set of dATP, dCTP, dGTP, dTTP	10µmol each	100 mM	U1330
	25 µmol each	100 mM	U1420
	40µmol each	100 mM	U1240
	200 µmol	100 mM	U1410

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dNTPs are >99% pure, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease of use in PCR and other applications.
- **Flexible:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –30°C to –10°C. Avoid exposure to frequent temperature changes.

PCR Amplifications From Each Size of Individual dNTPs.
Each catalog number supplies each individual dNTP at 100mM. Reactions are based on 200µM each dNTP in a 50µl reaction.

Cat.#	Quantity	Volume	Reactions
U1330, U1335	10 µmol each	100 µl each	1,000
U1420	25 µmol each	250 µl each	2,500
U1240, U1245	40 µmol each	400 µl each	4,000
U1410	200 µmol each	2 × 1,000 µl each	20,000

9479LA

Deoxyuridine Triphosphate (dUTP)

Product	Size Conc.	Cat.#
dUTP	40 µmol 100 mM	U1191
Set of dATP, dCTP, dGTP, dUTP	10µmol each 100 mM	U1335
	40µmol each 100 mM	U1245

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 98% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

dUTP (2′-Deoxyuridine, 5′-triphosphate) can be used in place of dTTP in PCR and RT-PCR protocols to prevent carryover from previous amplifications. The substitution of dUTP for dTTP in PCR results in uracil-containing PCR products that are suitable for most standard applications. The enzyme uracil-N-glycosylase (UNG, also referred to as UDG) can be added to a PCR premix to excise uracil from any contaminating PCR product, thereby preventing false positives. Each lot of dUTP is function-tested to ensure specific DNA amplification and the absence of nuclease activity.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dUTP is ≥98% pure, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease of use in PCR and other applications.

Storage Conditions: Store at –20°C. Avoid exposure to frequent temperature changes.

Available in the Helix® on-site stocking system

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qPCR and RT-qPCR

GoTaq® Real-Time qPCR and RT-qPCR Systems for Probe-Based Detection

Product	Size	Cat.#
GoTaq® Probe qPCR Master Mix	200 reactions	A6101
	1,000 reactions	A6102
GoTaq® Probe 2-Step RT-qPCR System	200 reactions	A6110
GoTaq® Probe 1-Step RT-qPCR System	200 reactions	A6120

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **GoTaq® Probe qPCR Master Mix** is optimized for quantitative PCR assays in the hydrolysis probe detection format. The mix is provided as a ready-to-use, stabilized 2X formulation that includes all components for qPCR (except template, primers and probe). This master mix does not contain a reference dye; however, a separate tube of carboxy-X-rhodamine (CXR) reference dye is included with this system, allowing users to add reference dye to amplification reactions if desired.

The GoTaq® Probe qPCR Master Mix provides resistance to a wide range of PCR inhibitors. This formulation uses antibody-mediated hot-start chemistry, allowing reaction setup to be performed at room temperature. The master mix also employs rapid hot-start activation and processive enzymes, making it compatible with both standard and fast instrument cycling programs.

The **GoTaq® Probe 2-Step RT-qPCR System** is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system protocol facilitates detection and relative quantification of RNA expression levels via a two-step RT-qPCR method using integrated components:

- GoScript™ Reverse Transcription System
- GoTaq® Probe qPCR Master Mix

The GoScript™ Reverse Transcription System includes an optimized reaction buffer and reverse transcriptase that enable efficient synthesis of first-strand cDNA in preparation for PCR amplification. The cDNA product may be added directly to downstream qPCR amplifications.

The **GoTaq® Probe 1-Step RT-qPCR System** is optimized for quantitative PCR assays in the hydrolysis probe detection format. The system enables detection and relative quantification of RNA expression levels using a one-step RT-qPCR method, combining GoScript™ Reverse Transcriptase and GoTaq® Probe qPCR Master Mix in single-step real-time amplification reactions.

The GoScript™ RT Mix for 1-Step RT-qPCR (50X) combines optimized amounts of GoScript™ Reverse Transcriptase, RNasin® Plus RNase Inhibitor, dUTP and additives to enhance single-step reactions.

Features:

- **Superior Performance:** Sensitive detection on any real-time instrument.
- **Enhanced Stability:** Exceptional room-temperature setup makes the system suitable for automation and high-throughput detection.
- **Versatility:** Compatible with both fast and standard cycling methods.
- **Confidence:** Backed by the Promega PCR Performance Guarantee.

Storage Conditions: Store all components between –30°C and –10°C. Protect components from light at all times. For best results, mix thawed solutions gently to minimize aeration and foaming, and keep on ice. For short-term storage and frequent use, the GoTaq® Probe qPCR Master Mix 2X may be kept at 2–8°C for up to 3 months if protected from light.

GoTaq® Real-Time qPCR and RT-qPCR Systems for Dye-Based Detection

Product	Size	Cat.#
GoTaq® qPCR Master Mix	200 × 50µl reactions	A6001
	1,000 × 50µl reactions	A6002
GoTaq® 1-Step RT-qPCR System	200 × 50µl reactions	A6020
GoTaq® 2-Step RT-qPCR System	50 × 20µl RT reactions + 200 × 50µl qPCR reactions	A6010
Available Separately	**Size**	**Cat.#**
CXR Reference Dye	100 µl	C5411

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The **GoTaq® qPCR Master Mix** is a ready-to-use 2X master mix for use in real-time quantitative PCR (qPCR and RT-qPCR). The system contains BRYT Green® dye, a novel fluorescent DNA-binding dye with minimal PCR inhibition for maximum PCR efficiency and greater fluorescence enhancement upon binding to double-stranded DNA (dsDNA) than SYBR® Green I. Containing the GoTaq® Hot Start Polymerase, optimized buffer and proprietary dye, the GoTaq® qPCR Master Mix provides robust real-time PCR with earlier quantification cycle values and broad range detection for increased reliability, reproducibility and sensitivity.

The **GoTaq® 2-Step RT-qPCR System** is a reagent system for quantitative analysis of RNA using a two-step reverse transcription-quantitative PCR (RT-qPCR) protocol. The components and protocol allow robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors, using the GoScript™ Reverse Transcription System and quantification using the GoTaq® qPCR Master Mix.

The **GoTaq® 1-Step RT-qPCR System** is a reagent system for quantitative analysis of RNA using a one-step reverse transcription-quantitative PCR (RT-qPCR) protocol in a single tube. The BRYT Green® Fluorescent Dye and optimized buffer formulations improve data accuracy and sensitivity with low-level targets.

Features:

- **Brighter Signal:** Sensitive detection for earlier quantitation of low- and high-copy-number targets.
- **Enhanced Stability:** Exceptional room-temperature setup makes the systems suitable for automation and high-throughput detection.
- **Versatility:** Compatibility with both fast and standard qPCR cycling methods.
- **Robustness:** High-efficiency, full-length cDNA synthesis in the presence of inhibitors.
- **Confidence:** Backed by the Promega PCR Performance Guarantee.

Storage Conditions: Upon arrival, store all components at –30°C to –10°C, protected from light. For immediate use, components may be stored at 2–8°C, protected from light, for up to 3 months.

Plexor® qPCR and qRT-PCR Systems

Product	Size	Cat.#
Plexor® qPCR System	200 reactions	A4031
Plexor® One-Step qRT-PCR System	200 reactions	A4041
Plexor® Two-Step qRT-PCR System	200 reactions	A4061

A4011, A4021, A4051 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Plexor® qPCR and qRT-PCR Systems are multiplex-capable real-time amplification systems using novel base pair chemistry. Each target is measured directly during the amplification process and not through a secondary reaction. Plexor® reactions require only two primers for each target.

The Plexor® Systems work by measuring a reduction in fluorescent signal during amplification. Amplification uses only two primers, one of which contains both a fluorescent tag and modified base. As amplification proceeds, fluorescence is reduced by site-specific incorporation of a fluorescent quencher inserted opposite the complementary modified base. The quencher is in close proximity to a fluorescent dye located on the end of the primer, resulting in a reduction in fluorescent signal. After PCR, a melt analysis can be performed to provide an internal control for the final assay design or to expedite trouble-shooting during development. The system also includes a proprietary reagent to minimize primer-dimer formation.

Features:

- **Simplify Multiplex Performance:** Only two primers are required for each target, making the design of multiplex assays much easier.
- **Improve Productivity:** Less labor, less time and less cost per assay. Measure controls and targets at the same time in the same well.
- **Enjoy Convenience:** The master mix format provides everything you need in one tube. Combine with your template and primers.
- **Obtain Strong Data:** Plexor® Systems measure a reduction in fluorescent signal during amplification. Quenching is directly proportional to amplicon accumulation. After amplification, a melt analysis can be performed to provide an internal control for specificity.
- **Use Your Existing Real-Time Instruments:** Plexor® technology works on most currently available real-time instruments capable of measuring more than one fluor. The free Plexor® Analysis Software allows users to import and analyze data from their preferred instrument platform. For an up-to-date list of supported instruments, visit the Plexor® Resources page at: **www.promega.com/products/pm/plexor-resources/**
- **Perform Three Simple Steps to Use Plexor® Systems:**
  Step 1. Design Your Assay: Choose your primer sets, then order from your preferred oligo provider.
  Step 2. Run the Assay: Instruction manuals are available for a wide variety of real-time instruments including those from Applied Biosystems and Roche.
  Step 3. Analyze Your Data: Export the raw data from your real-time instrument, then import into the free Plexor® Analysis Software. The Plexor® software converts the quenching data into cycle threshold (C_t) values and generates standard curves.

Storage Conditions: Store at –20°C.

MOPS/EDTA Buffer

Product	Size	Cat.#
MOPS/EDTA Buffer	3 × 10 ml	Y5101

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: MOPS/EDTA Buffer is provided at pH 7.4 for resuspension and dilution of primers and templates used in the Plexor® qPCR and qRT-PCR Systems. It is critical that this MOPS/EDTA Buffer be used with the Iso-dC-containing primers used in the Plexor® Systems, as these primers are sensitive to pH below 7.0.

Storage Conditions: Store at any temperature.

StemElite® Gene Expression System

Product	Size	Cat.#
StemElite® Gene Expression System	100 qPCR reactions	B1001
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The StemElite® Gene Expression System is a novel real-time quantitative PCR (qPCR) system for the detection and relative quantification of RNA expression levels associated with the differentiation state or 'potency' of cells. The StemElite® Gene Expression System is optimized to quantitatively amplify a two-color duplex, enabling the user to amplify a transcript of interest as well as a reference gene in a single reaction.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH or Actb).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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StemElite® Human Pluripotent Transcripts

Product	Size	Cat.#
StemElite® NANOG/GAPDH Primer Pair (20X)	100 µl	B1011
StemElite® SOX2/GAPDH Primer Pair (20X)	100 µl	B1021
StemElite® POU5F1/GAPDH Primer Pair (20X)	100 µl	B1031
StemElite® LIN28/GAPDH Primer Pair (20X)	100 µl	B1041
StemElite® KLF4/GAPDH Primer Pair (20X)	100 µl	B1051
StemElite® MYC/GAPDH Primer Pair (20X)	100 µl	B1061
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NANOG, SOX2, POU5F1, LIN28, KLF4 and MYC are functionally associated with maintenance of the undifferentiated human embryonic stem cell.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Human Heart-Associated Transcripts

Product	Size	Cat.#
StemElite® NPPA/GAPDH Primer Pair (20X)	100 µl	B1071
StemElite® MYL7/GAPDH Primer Pair (20X)	100 µl	B1081
StemElite® MYL2/GAPDH Primer Pair (20X)	100 µl	B1091
StemElite® MYH6/GAPDH Primer Pair (20X)	100 µl	B1101
StemElite® MYH7/GAPDH Primer Pair (20X)	100 µl	B1111
StemElite® NKX2-5/GAPDH Primer Pair (20X)	100 µl	B1121
StemElite® TNNT2/GAPDH Primer Pair (20X)	100 µl	B1131
StemElite® TNNI3/GAPDH Primer Pair (20X)	100 µl	B1141
StemElite® MEF2C/GAPDH Primer Pair (20X)	100 µl	B1151
StemElite® PLN/GAPDH Primer Pair (20X)	100 µl	B1161
StemElite® GATA4/GAPDH Primer Pair (20X)	100 µl	B1171
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Pluripotential stem cells can give rise to differentiated cells and tissues for all three embryonic germ layers. NPPA, MYL7, MYL2, MYH6, MYH7, NKX2-5, TNNT2, TNNI3, MEF2C, PLN and GATA4 are mesodermal markers associated with differentiation of cardiac muscle.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Human Pancreatic-Associated Transcripts

Product	Size	Cat.#
StemElite® HNF4A/GAPDH Primer Pair (20X)	100 µl	B1301
StemElite® HNF1B/GAPDH Primer Pair (20X)	100 µl	B1311
StemElite® PDX1/GAPDH Primer Pair (20X)	100 µl	B1321
StemElite® INS/GAPDH Primer Pair (20X)	100 µl	B1331
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Pluripotential stem cells can give rise to differentiated cells and tissues for all three embryonic germ layers. HNF4A, HNF1B, PDX1 and INS are mesodermal markers associated with differentiation of pancreatic cells.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Differentiation-Associated Transcripts

Product	Size	Cat.#
StemElite® FOXA2/GAPDH Primer Pair (20X)	100 µl	B1341
StemElite® SOX17/GAPDH Primer Pair (20X)	100 µl	B1351
StemElite® GATA6/GAPDH Primer Pair (20X)	100 µl	B1361
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Pluripotential stem cells can give rise to differentiated cells and tissues for all three embryonic germ layers. FOXA2, SOX17 and GATA6 are nonspecific differentiation markers.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Mouse Pluripotent Transcripts

Product	Size	Cat.#
StemElite® Mus-Nanog/Actb Primer Pair (20X)	100 µl	B1371
StemElite® Mus-Sox2/Actb Primer Pair (20X)	100 µl	B1381
StemElite® Mus-Pou5f1/Actb Primer Pair (20X)	100 µl	B1391
StemElite® Mus-Lin28/Actb Primer Pair (20X)	100 µl	B1401
StemElite® Mus-Klf4/Actb Primer Pair (20X)	100 µl	B1411
StemElite® Mus-Myc/Actb Primer Pair (20X)	100 µl	B1421
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Mus-Nanog, Mus-Sox2, Mus-Pou5f1, Mus-Lin28, Mus-Klf4 and Mus-Myc are functionally associated with maintenance of the undifferentiated mouse embryonic stem cell.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (Actb).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

RT-PCR

GoScript™ Reverse Transcription System

Product	Size	Cat.#
GoScript™ Reverse Transcription System	50 reactions	A5000
	100 reactions	A5001
Available Separately	**Size**	**Cat.#**
GoScript™ Reverse Transcriptase	100 reactions	A5003
	500 reactions	A5004

A5000, A5001 For Research Use Only. Not for Use in Diagnostic Procedures. A5003, A5004 For Laboratory Use.

Description: The GoScript™ Reverse Transcription System includes a reverse transcriptase and a specialized set of reagents for efficient synthesis of first-strand cDNA optimized for quantitative PCR amplification. GoScript™ Reverse Transcriptase uses M-MLV Reverse Transcriptase and state-of-the-art buffer technology to deliver robust, reliable cDNA synthesis of a full range of rare and abundant transcripts, even in the presence of inhibitors. GoScript™ Reverse Transcriptase is qualified for use in qPCR, including GoTaq® qPCR and Plexor® RT-qPCR systems.

Features:

- **Ultra-Active:** Save money on every reaction.
- **Sensitive:** Detect rare transcripts.
- **Processive:** Transcribe long messages.
- **Resilient:** Synthesize cDNA in the presence of strong inhibitors.

Storage Conditions: Store at –20°C.

ImProm-II™ Reverse Transcription System

Product	Size	Cat.#
ImProm-II™ Reverse Transcription System	100 reactions	A3800
Available Separately	**Size**	**Cat.#**
ImProm-II™ Reverse Transcriptase	10 reactions	A3801
	100 reactions	A3802
	500 reactions	A3803

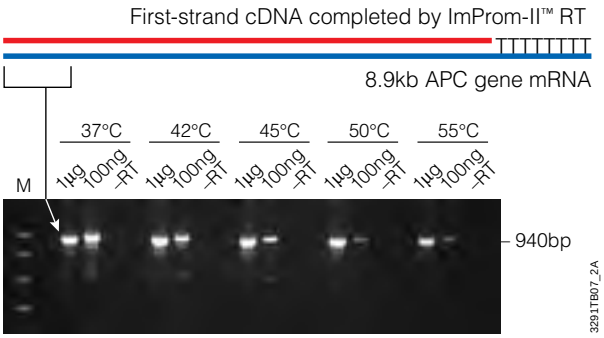
A3800 For Research Use Only. Not for Use in Diagnostic Procedures. A3801, A3802, A3803 For Laboratory Use.

Description: The ImProm-II™ Reverse Transcription System produces efficient, robust synthesis of first-strand cDNA in preparation for PCR amplification. The components of the ImProm-II™ Reverse Transcription System can be used to reverse transcribe RNA templates starting with total RNA, poly(A)+ mRNA or synthetic transcript RNA. The optimized reaction buffer and powerful ImProm-II™ Reverse Transcriptase provided in the ImProm-II™ System together enable robust, full-length cDNA synthesis for the reproducible analysis of rare or long messages. The cDNA synthesis conditions were formulated for standalone applications or for easy transition to gene-specific target amplification. The reverse transcription reaction (1–20µl) can be amplified directly using *Taq* DNA polymerase in coupled or uncoupled PCR.

Features:

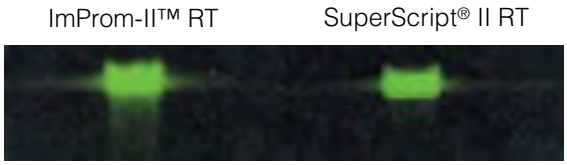
- **Amenable to Full-Length RT-PCR:** Reverse transcribe long RNA templates up to 8.9kb.
- **Microarray-Compatible:** May be used to incorporate regular, Cy®3-modified, Cy®5-modified and amino-allyl-modified nucleotides.
- **Easy to Use:** Kit format provides all reagents necessary for efficient reverse transcription.
- **Scalable and Flexible:** 1–20µl of the initial reverse transcription reaction may be used in subsequent PCR, and the optimized buffer allows coupled RT-PCR.
- **RT Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl and 50mM DTT. A 25mM $MgCl_2$ Solution also is included.
- **Versatile:** Use with your thermostable DNA polymerase of choice.
- **Flexible:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C. Store Positive Control RNA at –70°C.

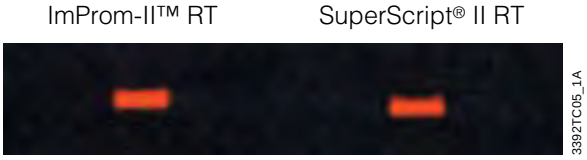


Full-length cDNA synthesis of 8.9kb template over a range of temperatures using the ImProm-II™ Reverse Transcription System as demonstrated by selective amplification of terminal 3′ sequences in two-step RT-PCR. Entire 8.9kb message must be reverse transcribed by the ImProm-II™ RT from the oligo(dT) primer to amplify the terminal 940bp sequence. Message was amplified from either 1µg or 100ng of total RNA. Control reactions without the reverse transcriptase are shown (–RT) as well. The protocol is available in the *ImProm-II™ Reverse Transcription System Technical Manual*, #TM236.

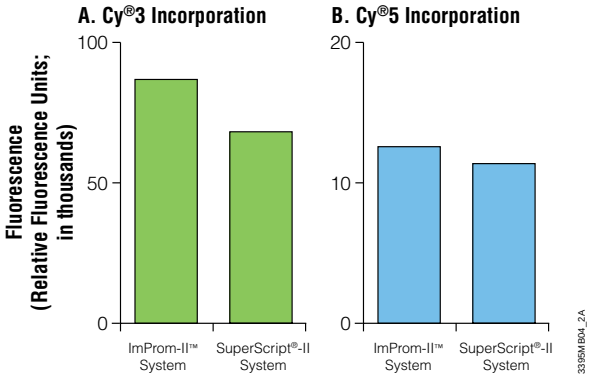
A. Cy®3 Incorporation



B. Cy®5 Incorporation



Incorporation studies of fluorescently labeled nucleotides. ImProm-II™ Reverse Transcription System allows high-efficiency incorporation of Cy®3 and Cy®5 fluorescent nucleotides. This demonstrates fluorescent nucleotide incorporation by ImProm-II™ RT vs. SuperScript® II RT using a 1.2kb kanamycin transcript as template. A single fluorescent band was produced and visualized using an FMBIO® II Fluorescence Imaging System.



Relative Cy®3 and Cy®5 nucleotide incorporation by ImProm-II™ Reverse Transcription System compared to Superscript® II First Strand Synthesis System. Results with Cy®3 dUTP **(Panel A)** and Cy®5 dUTP **(Panel B)** incorporation are reported. Panels A and B correspond to Panels A and B in the figure above.

Reverse Transcription System

Product	Size	Cat.#
Reverse Transcription System	100 reactions	A3500
Available Separately	**Size Conc.**	**Cat.#**
Magnesium Chloride Solution	1.5 ml 25 mM	A3511
Reverse Transcription 10X Buffer	1.4 ml	A3561

A3500 For Research Use Only. Not for Use in Diagnostic Procedures. A3511, A3561 For Laboratory Use.

Description: The Reverse Transcription System provides reagents to efficiently reverse transcribe RNA into cDNA in 15 minutes. The cDNA prepared from each reaction using this system may be used directly in multiple PCR amplifications using *Taq* DNA polymerase. The AMV Reverse Transcriptase synthesizes single-stranded cDNA from total or poly(A)+ RNA. Both Oligo(dT)$_{15}$ and Random Primers are included, allowing cDNA synthesis from virtually any RNA source. The system contains sufficient reagents for 100 cDNA synthesis reactions, processing 1µg of RNA per reaction. Each cDNA synthesis reaction may be divided and used in up to 20 separate PCR amplifications. A polyadenylated 1.2kb RNA transcript is provided as a control template for cDNA synthesis.

Features:

- **Speed:** Efficiently reverse transcribe poly(A)+ mRNA or total RNA in 15 minutes.
- **Convenience:** PCR-compatible components are provided in optimized volumes for 100 reactions.
- **Positive Controls:** A polyadenylated RNA transcript is provided to help troubleshoot RT-PCR parameters.

Storage Conditions: Store at –20°C. Store Positive Control RNA at –70°C.

Available in the Helix® on-site stocking system
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AccessQuick™ RT-PCR System

Product	Size	Cat.#
AccessQuick™ RT-PCR System	20 reactions	A1701
	100 reactions	A1702
	500 reactions	A1703

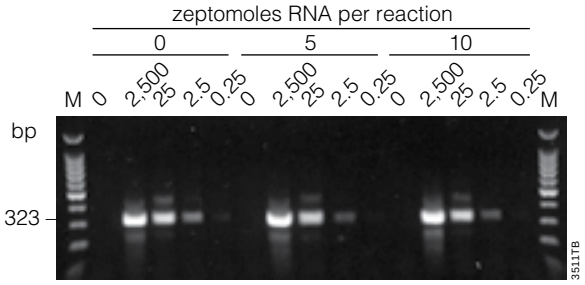
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The AccessQuick™ RT-PCR System is an easy and convenient master mix system for setting up one-tube RT-PCR. The system simplifies RT-PCR by combining the following components in a single tube: *Tfl* DNA Polymerase, dNTPs, magnesium sulfate and reaction buffer. The AMV RT enzyme is provided in a separate tube to allow important no-RT control reactions. The AccessQuick™ Master Mix is simply added to RNA templates in reaction vials, followed by the AMV RT, primers and water. The AccessQuick™ RT-PCR Master Mix is intended for routine RT-PCR applications that have been previously optimized and do not require extreme conditions.

Features:

- **Maximum Convenience:** Save yourself four pipetting steps. Simply combine the AccessQuick™ Master Mix, AMV RT, your gene-specific primers, your RNA template and water. Separate AMV RT allows important no-RT control reactions.
- **Less Template:** Amplify from zeptomole (10^{-21}mol) levels of RNA.
- **No Buffer Additions Required:** Set up reactions in a single tube, place in the thermal cycler, come back later for results—no additions between the reverse transcription and DNA amplification steps.
- **Stability:** System components are stable over many freeze-thaw cycles.

Storage Conditions: Store all system components at –20°C.



Stability of AccessQuick™ Master Mix through multiple freeze-thaw events. Rapid freeze-thaw events were performed 0, 5 and 10 times by removing a sample of the AccessQuick™ Master Mix from –70°C storage and placing it in a 50°C heat block. After 5 cycles, and again after 10 cycles, we added AMV RT, primers and RNA. All samples were used in RT-PCR reactions to amplify a 323bp fragment from the indicated amounts of the 1.2kb Kanamycin Positive Control RNA (Cat.# C1381) template. Lane M = 100bp DNA Ladder (Cat.# G2101).

Access RT-PCR System

Product	Size	Cat.#
Access RT-PCR Introductory System	20 reactions	A1260
Access RT-PCR System	100 reactions	A1250
	500 reactions	A1280
Available Separately	**Size Conc.**	**Cat.#**
AMV Reverse Transcriptase	300 u 10 u/µl	M5101
	1,000 u 10 u/µl	M5108
AMV Reverse Transcriptase (HC)	600 u 20–25 u/µl	M9004

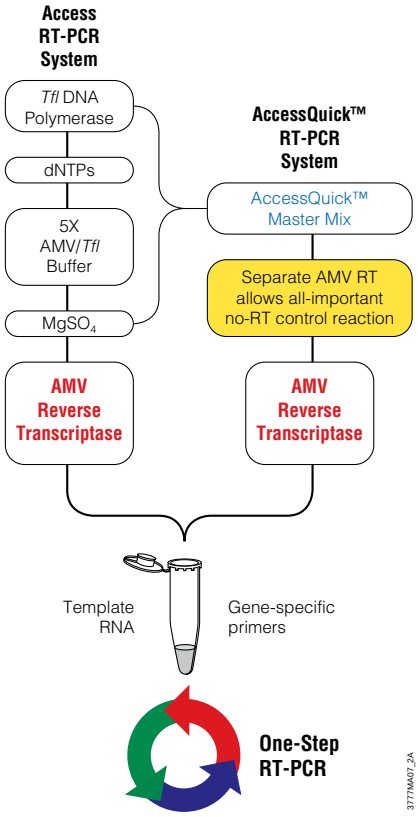
A1260, A1250, A1280 For Research Use Only. Not for Use in Diagnostic Procedures. M5101, M5108, M9004 For Laboratory Use.

Description: The Access RT-PCR System is designed for reverse transcription (RT) and PCR amplification of a specific target RNA from total RNA or mRNA. This one-tube, two-enzyme system provides sensitive, quick and reproducible analysis of even rare RNAs. The system uses AMV Reverse Transcriptase (AMV RT) from Avian Myeloblastosis Virus for first-strand DNA synthesis and thermostable *Tfl* DNA polymerase from *Thermus flavus* for second-strand cDNA synthesis and DNA amplification. The Access RT-PCR System includes an optimized single-buffer system that permits extremely sensitive detection of RNA transcripts without buffer additions between the reverse transcription and PCR amplification steps. This simplifies the procedure and reduces the potential for contamination. In addition, the improved performance of AMV Reverse Transcriptase at elevated temperatures in the AMV/*Tfl* 5X Reaction Buffer minimizes problems encountered with secondary structures in RNA.

Features:

- **Maximum Control:** Separate tubes of each component allow you to control every step of the reaction. You can optimize Mg^{2+} and perform no-reverse transcriptase control reactions.
- **Less Template:** Detect message from as little as 1pg of total RNA or mRNA.
- **No Buffer Additions Required:** The AMV/*Tfl* 5X Reaction Buffer results in optimal enzyme activity without buffer additions between the reverse transcription and DNA amplification steps.
- **Performance-Tested System:** Promega PCR Systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.
- **Flexible Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store all system components at –20°C. For long-term storage, the Positive Control RNA with Carrier must be stored at –70°C.



Features of Access and AccessQuick™ RT-PCR Systems.

	Access RT-PCR System *Maximum Control*	AccessQuick™ RT-PCR System *Maximum Convenience*
Components	Individual tubes of *Tfl* DNA Polymerase, AMV RT, dNTPs and reaction buffer	*Tfl* DNA Polymerase, dNTPs and reaction buffer combined in master mix. AMV RT in separate tube
Mg^{2+} Concentration	Adjustable	1.5mM
Controls Included	Yes	No

9478LA

AMV Reverse Transcriptase

Product	Size Conc.	Cat.#
AMV Reverse Transcriptase	300 u 10 u/µl	M5101
	1,000 u 10 u/µl	M5108
AMV Reverse Transcriptase (HC)	600 u 20–25 u/µl	M9004

For Laboratory Use.

Description: Avian Myeloblastosis Virus Reverse Transcriptase (AMV RT) catalyzes DNA polymerization using template DNA, RNA or RNA:DNA hybrids. The enzyme requires a primer (DNA primers are more efficient than RNA primers) as well as Mg^{2+} or Mn^{2+}. The enzyme possesses an intrinsic RNase H activity. Both nonionic detergents and sulfhydryl compounds stabilize the enzyme activity in vitro.

Features:

- **High Concentration:** Cat.# M9004 contains 600 units of AMV RT at 20–25u/µl.
- **5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 250mM KCl, 50mM $MgCl_2$, 2.5mM spermidine, 50mM DTT.
- **Temperature Stability:** AMV RT is the preferred reverse transcriptase for templates with high secondary structure due to its stability at higher reaction temperatures (37–58°C).

Storage Conditions: Store at –20°C.

M-MLV Reverse Transcriptase

Product	Size Conc.	Cat.#
M-MLV Reverse Transcriptase	10,000 u 200 u/µl	M1701
	50,000 u 200 u/µl	M1705
M-MLV Reverse Transcriptase Buffer Pack	2 × 1 ml	M5313

For Laboratory Use.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase (M-MLV RT) is an RNA-dependent DNA polymerase that can be used in cDNA synthesis with long messenger RNA templates (>5kb). The enzyme is a product of the *pol* gene of M-MLV and consists of a single subunit with a molecular weight of 71kDa. The RNase H activity of M-MLV RT is weaker than the commonly used Avian Myeloblastosis Virus (AMV) reverse transcriptase.

Features:

- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **May Be Heat-Inactivated:** M-MLV RT is inactivated by heating at 70°C for 10 minutes.
- **Flexible:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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M-MLV Reverse Transcriptase, RNase H Minus

Product	Size	Conc.	Cat.#
M-MLV Reverse Transcriptase, RNase H Minus	10,000 u	100–200 u/µl	M5301

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase, RNase H Minus (M-MLV RT [H–]), is an RNA-dependent DNA polymerase that can be used in cDNA synthesis with long messenger RNA templates (>5kb). This form of M-MLV Reverse Transcriptase is genetically altered to remove the associated RNase H activity. Although many researchers are successful in using M-MLV RT (H+) for analytical and some preparative cDNA applications, reverse transcriptases lacking RNase H activity provide another option to prepare long cDNAs and libraries containing a high percentage of full-length cDNA.

Features:

- **RNase H Minus:** Provides optimal conditions to prepare full-length cDNA from long RNA templates.
- **Provided with 5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **May Be Heat-Inactivated:** M-MLV RT is inactivated by heating at 70°C for 10 minutes.

Storage Conditions: Store at –20°C.

M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant

Product	Size	Cat.#
M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant	2,500 u	M3681
	10,000 u	M3682
	50,000 u	M3683

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Moloney Murine Leukemia Virus Reverse Transcriptase, RNase H Minus (M-MLV RT [H–]), Point Mutant, is an RNA-dependent DNA polymerase that can be used in cDNA synthesis with long RNA templates (>5kb). The lack of RNase H activity is beneficial for this application, as RNase H can start to degrade templates when incubation times are long, as they may be when synthesizing long cDNAs. Although many researchers are successful in using M-MLV RT (H+) for analytical and some preparative cDNA applications, reverse transcriptases lacking RNase H activity provide another option to prepare long cDNAs and libraries containing a high percentage of full-length cDNA.

Features:

- **RNase H Minus:** Provides optimal conditions to prepare full-length cDNA from long RNA templates.
- **Temperature Stability:** Thermostability of this point mutant prevents problems associated with secondary structure.
- **Increased Polymerase Activity:** M-MLV RT (H–), Point Mutant, gives higher yields of cDNA compared with the deletion mutant (Cat.# M5301).
- **5X Reaction Buffer:** 250mM Tris-HCl (pH 8.3 at 25°C), 375mM KCl, 15mM $MgCl_2$, 50mM DTT.
- **Broad Working Range:** More tolerance to variations in enzyme and substrate concentration means improved consistency in performance.

Storage Conditions: Store at –20°C.

Tth DNA Polymerase

Product	Size	Conc.	Cat.#
Tth DNA Polymerase	100 u	5 u/µl	M2101
	500 u	5 u/µl	M2105

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: *Tth* DNA Polymerase is a thermostable enzyme of approximately 94kDa isolated from *Thermus thermophilus* HB-8. The enzyme replicates DNA at 74°C and exhibits a half-life of 20 minutes at 95°C. *Tth* DNA Polymerase catalyzes the polymerization of nucleotides into duplex DNA in the 5′→3′ direction in the presence of magnesium and the polymerization of nucleotides into DNA using an RNA template in the 5′→3′ direction in the presence of manganese. The enzyme also possesses a 5′→3′ exonuclease activity. *Tth* DNA Polymerase is recommended for use in PCR, RT-PCR, reverse transcription and primer extension reactions at elevated temperatures.

10X Reverse Transcription Buffer: 100mM Tris-HCl (pH 8.3 at 25°C), 900mM KCl.

10X Chelate Buffer: 100mM Tris-HCl (pH 8.3 at 25°C), 1M KCl, 7.5mM EGTA, 0.5% Tween® 20, 50% glycerol.

Thermophilic DNA Polymerase 10X Reaction Buffer: 500mM KCl, 100mM Tris-HCl (pH 9.0 at 25°C) and 1% Triton® X-100. Buffer is optimized for use with 0.2mM of each dNTP.

Manganese and Magnesium Chloride: 10mM $MnCl_2$ and 25mM $MgCl_2$ Solutions provided.

Features:

- **Increased Specificity for RT-PCR:** The ability to reverse transcribe at higher temperatures results in increased specificity of primer hybridization and extension.
- **Minimized Secondary Structures:** Higher temperature RT-PCR minimizes problems associated with strong secondary structures in RNA.
- **Performance Guarantee:** Promega PCR systems, enzymes and reagents are proven in PCR to ensure reliable, high-performance results. If you are not completely satisfied with any Promega PCR product, we will send a replacement or refund your account.

Storage Conditions: Store at –20°C.

Deoxynucleotide Triphosphates (dNTPs)

Product	Size	Conc.	Cat.#
dATP	25 µmol	100 mM	U1205
	40 µmol	100 mM	U1201
	200 µmol	100 mM	U1202
dGTP	25 µmol	100 mM	U1215
	40 µmol	100 mM	U1211
	200 µmol	100 mM	U1212
dCTP	25 µmol	100 mM	U1225
	40 µmol	100 mM	U1221
	200 µmol	100 mM	U1222
dTTP	25 µmol	100 mM	U1235
	40 µmol	100 mM	U1231
	200 µmol	100 mM	U1232
Set of dATP, dCTP, dGTP, dTTP	10 µmol each	100 mM	U1330
	25 µmol each	100 mM	U1420
	40 µmol each	100 mM	U1240
	200 µmol	100 mM	U1410

For Laboratory Use.

Description: High-quality deoxynucleotide triphosphates (dNTPs) are critical for the success of many key procedures such as cDNA synthesis, sequencing and labeling. Promega dNTPs have greater than 99% triphosphate content and are provided at a concentration of 100mM in water at pH 7.5.

Features:

- **Dependable:** PCR-tested deoxynucleotides ensure optimal performance with all Promega amplification enzymes.
- **Consistent:** dNTPs are >99% pure, allowing highly consistent results.
- **Convenient:** Supplied at a convenient concentration (100mM in water) for ease of use in PCR and other applications.
- **Flexible:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –30°C to –10°C. Avoid exposure to frequent temperature changes.

PCR Amplifications From Each Size of Individual dNTPs.
Each catalog number supplies each individual dNTP at 100mM. Reactions are based on 200µM each dNTP in a 50µl reaction.

Cat.#	Quantity	Volume	Reactions
U1330, U1335	10 µmol each	100 µl each	1,000
U1420	25 µmol each	250 µl each	2,500
U1240, U1245	40 µmol each	400 µl each	4,000
U1410	200 µmol each	2 × 1,000 µl each	20,000

9479LA

Ribonucleotide Triphosphates (rNTPs)

Product	Size	Cat.#
rATP, rCTP, rGTP, rUTP, each at 10mM in separate tubes	0.5 ml	P1221
rATP, 10mM	0.5 ml	P1132
rCTP, 10mM	0.5 ml	P1142
rGTP, 10mM	0.5 ml	P1152
rUTP, 10mM	0.5 ml	P1162
rATP, 100mM	400 µl	E6011
rUTP, 100mM	400 µl	E6021
rGTP, 100mM	400 µl	E6031
rCTP, 100mM	400 µl	E6041
rCTP, rATP, rUTP, rGTP, 100mM each	4 × 400 µl	E6000

For Laboratory Use.

Description: Ribonucleotide triphosphates (rNTPs) are provided in individual tubes and qualified for use with the Riboprobe® and HeLaScribe® Systems. The rNTPs are supplied in nuclease-free water. Purity is verified by HPLC analysis.

Features:

- **Pretested:** rNTPs are tested for functionality with in vitro transcription reactions.

Storage Conditions: Store at –20°C.

Universal RiboClone® cDNA Synthesis System

Product	Size	Cat.#
Universal RiboClone® cDNA Synthesis System	1 system	C4360
Available Separately	**Size**	**Cat.#**
Oligo(dT)$_{15}$ Primer	20 µg	C1101
Random Primers	20 µg	C1181
Spin Columns	10 each	C1281
EcoRI Adaptors	150 pmol	C1291
1.2kb Kanamycin Positive Control RNA	5 µg	C1381
Sephacryl® S-400	10 ml	V3181

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Universal RiboClone® cDNA Synthesis System contains the reagents required for synthesis of double-stranded cDNA from mRNA and subsequent ligation into a suitable vector. The system is based on the method described by Okayama and Berg with modifications by Gubler and Hoffman. First-strand synthesis is driven by AMV (Avian Myeloblastosis Virus) Reverse Transcriptase and either Random Primers or Oligo(dT)$_{15}$ Primer, followed directly by second-strand replacement synthesis using RNase H and DNA Polymerase I. After treatment with T4 DNA Polymerase to flush the ends, the double-stranded cDNA molecules are prepared for cloning by size fractionation and addition of EcoRI Adaptors. The resulting cDNA preparation then can be cloned into a suitable vector.

Features:

- **Convenient:** Contains all of the necessary reagents to synthesize double-stranded cDNA from RNA.
- **Flexible:** Both Oligo(dT)$_{15}$ Primer and Random Primers are included, providing the researcher a choice of priming methods.

Storage Conditions: Store control RNA at –70°C. Store Sephacryl® S-400 at 4°C and Spin Columns at room temperature. Store other components at –20°C.

Available in the Helix® on-site stocking system

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Oligonucleotides and Primers: cDNA Synthesis and Cloning

Product	Size	Cat.#
Oligo(dT)$_{15}$ Primer	20 µg	C1101
Random Primers	20 µg	C1181
EcoRI Adaptors	150 pmol	C1291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Oligo(dT)$_{15}$ Primer is suitable for use as a primer for first-strand cDNA synthesis with a reverse transcriptase. The primer hybridizes to the poly(A) tail of mRNA.

Random Primers can be used for first-strand cDNA synthesis and cloning; they are also available as components of the Universal Riboclone® cDNA Synthesis System (Cat.# C4360) and Reverse Transcription System (Cat.# A3500). The primers are random hexadeoxynucleotides.

The **EcoRI Adaptors** consist of two complementary oligonucleotides: a 16mer and a 12mer phosphorylated at the 5′-end. The oligonucleotides are provided annealed in equimolar concentrations in water. The EcoRI Adaptors attach EcoRI "sticky" ends to blunt-ended DNA.

Storage Conditions: Store at –20°C.

PCR Cloning

pGEM®-T Vector Systems

Product	Size	Cat.#
pGEM®-T Vector System I	20 reactions	A3600
pGEM®-T Vector System II	20 reactions	A3610

For Research Use Only. Not for Use in Diagnostic Procedures.

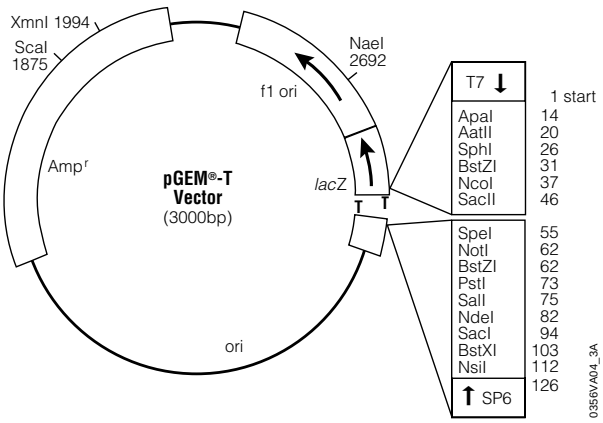
Description: The pGEM®-T Vector Systems are convenient systems to clone PCR products. The pGEM®-T Vector is prepared by cutting the pGEM®-5Zf(+) Vector with EcoRV and adding a 3′ terminal thymidine to both ends. These single 3′-T overhangs at the insertion site greatly improve the ligation efficiency of a PCR product into the plasmid by preventing recircularization of the vector and providing a compatible overhang for ligation of PCR products generated by thermostable polymerases that add a single deoxyadenosine, in a template-independent fashion, to the 3′-ends of amplified fragments.

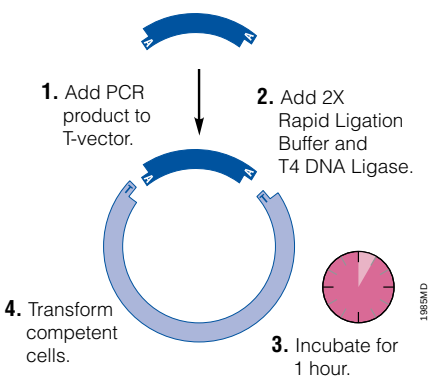
The multiple cloning site is flanked by recognition sites for the restriction enzyme BstZI, allowing release of the insert by a single-enzyme digestion. Alternatively, a double digestion may be used to release the insert from the vector. The pGEM®-T Vector System II contains JM109 Competent Cells in addition to all of the pGEM®-T Vector System I components.

Features:

- **Rapid Ligation:** The 2X Rapid Ligation Buffer provided allows reactions to be completed in 1 hour at room temperature.
- **Blue/White Screening:** T7 and SP6 RNA polymerase promoters flank a multiple cloning region within the α-peptide coding region for β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be directly identified by color screening on indicator plates.
- **f1 Origin of Replication:** Allows preparation of single-stranded DNA.

Storage Conditions: Store competent cells at –70°C; store all other components at –20°C.





The rapid ligation reaction reduces ligation time to just 60 minutes.

pGEM®-T Easy Vector Systems

Product	Size	Cat.#
pGEM®-T Easy Vector System I	20 reactions	A1360
pGEM®-T Easy Vector System II	20 reactions	A1380

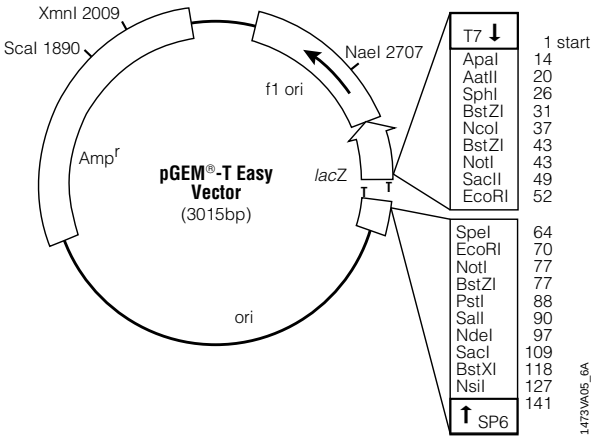
For Research Use Only. Not for Use in Diagnostic Procedures.

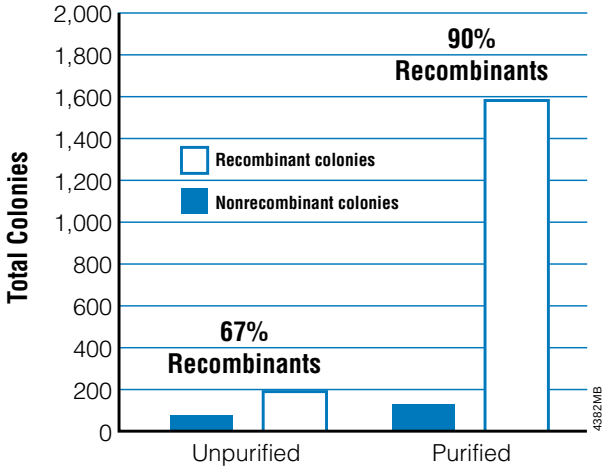
Description: The pGEM®-T Easy Vector Systems are convenient systems to clone PCR products. They offer all of the advantages of the pGEM®-T Vector Systems with the added convenience of recognition sites for EcoRI and NotI flanking the insertion site. Thus, several options exist to remove the desired insert DNA with a single restriction digestion. The pGEM®-T Easy Vector System II contains JM109 Competent Cells in addition to all of the pGEM®-T Easy Vector System I components.

Features:

- **Flexibility:** The multiple cloning site is flanked by restriction enzyme sites for BstZI, NotI and EcoRI, allowing three options to remove the insert with a single digest.
- **Rapid Ligation:** The 2X Rapid Ligation Buffer provided allows reactions to be completed in 1 hour at room temperature.
- **Blue/White Screening:** T7 and SP6 RNA polymerase promoters flank a multiple cloning region within the α-peptide coding region for β-galactosidase. Insertional inactivation of the α-peptide allows recombinant clones to be directly identified by color screening on indicator plates.
- **f1 Origin of Replication:** Allows preparation of single-stranded DNA.

Storage Conditions: Store competent cells at –70°C; store all other components at –20°C.





Purification of PCR products enhances cloning success. A 500bp PCR product was purified with the Wizard® SV Gel and PCR Clean-Up System and cloned into the pGEM®-T Easy Vector. Both the percent recombinants and total number of colonies increase with a pure PCR product. White bars represent recombinant colonies. Blue bars represent nonrecombinant colonies.

Available in the Helix® on-site stocking system

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pTARGET™ Mammalian Expression Vector System

Product	Size	Cat.#
pTARGET™ Mammalian Expression Vector System	20 reactions	A1410

For Research Use Only. Not for Use in Diagnostic Procedures.

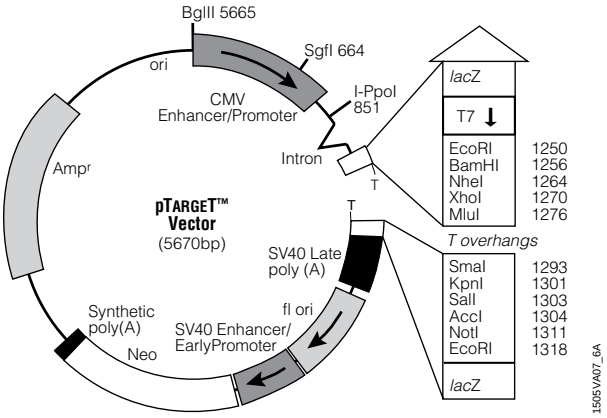
Description: The pTARGET™ Mammalian Expression Vector System is a convenient system for cloning PCR products and expressing cloned PCR products in mammalian cells. The vector is prepared by digestion with EcoRV followed by addition of a 3´ terminal thymidine to each end. These single 3´-T overhangs at the insertion site greatly improve efficiency of ligation of a PCR product into the plasmid in two ways. First, the overhangs prevent recircularization of the vector; second, they provide a compatible overhang for PCR products generated by thermostable polymerases that add a single deoxyadenosine, in a template-independent fashion, to the 3´-ends of amplified fragments. The pTARGET™ Vector also contains a modified version of the coding sequence of the α-peptide of β-galactosidase, which allows recombinants to be selected using blue/white screening.

The pTARGET™ Vector carries the human cytomegalovirus (CMV) immediate-early enhancer/promoter region to promote constitutive expression of cloned DNA inserts in mammalian cells. This vector also contains the neomycin phosphotransferase gene, a selectable marker for mammalian cells. The pTARGET™ Vector can be used for transient expression or stable expression by selecting transfected cells with the antibiotic G-418.

Features:

- **Simple PCR Cloning:** "T" overhangs permit direct ligation of PCR products generated by thermostable enzymes such as *Taq* DNA polymerase.
- **Strong, Constitutive Expression:** The CMV enhancer/promoter region allows strong, constitutive expression in many cell types. In transgenic mice, expression of the chloramphenicol acetyltransferase (CAT) gene under the regulation of the CMV enhancer/promoter was observed in 24 of the 28 tissues examined. The vector is maintained as an episome in cells expressing the SV40 large T antigen, leading to even higher levels of expression.
- **Blue/White Screening:** Allows easy identification of recombinant clones. A single digest removes the insert DNA.
- **Stable Transfectants:** Select for stable transfectants using the neomycin phosphotransferase gene.

Storage Conditions: Store competent cells at –70°C; store all other components at –20°C or –70°C.



pTARGET™ Sequencing Primer

Product	Size	Cat.#
pTARGET™ Sequencing Primer	2 µg	Q4461

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pTARGET™ Sequencing Primer is designed for sequencing inserts cloned into the pTARGET™ Mammalian Expression Vector (Cat.# A1410). The sequencing primer hybridizes to the region of the *lacZ* gene at nucleotides 1367–1344 on the pTARGET™ Vector.

The primer can be used **only** for sequencing inserts cloned into the pTARGET™ Vector. The primer sequence is **not** a binding site for any RNA polymerases and **cannot** be used to generate in vitro transcripts.

The sequence of the pTARGET™ Sequencing Primer is 5´-d(TTACGCCAAGTTAT TTAGGTGACA)-3´.

The primer is supplied at a concentration of 10ng/µl (1.25pmol/µl) in sterile water.

Storage Conditions: Store at –20°C.

16 Protein Expression and Mass Spectrometry

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Eukaryotic Cell-Free Protein Expression

TnT® T7 Insect Cell Extract Protein Expression System

Product	Size	Cat.#
TnT® T7 Insect Cell Extract Protein Expression System	10 reactions	L1101
	40 reactions	L1102
pF25A ICE T7 Flexi® Vector	20 µg	L1061
pF25K ICE T7 Flexi® Vector	20 µg	L1081

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® T7 Insect Cell Extract Protein Expression System is a convenient, quick, single-tube, coupled transcription/translation system for the cell-free expression of proteins. Protein synthesis reactions are initiated by the addition of a DNA template, eliminating the need for the time-consuming process of in vitro RNA synthesis.

The extract is made from the commonly used *Spodoptera frugiperda* Sf21 cell line. All components necessary for the transcription/translation are present in the TnT® T7 ICE Master Mix. To initiate protein synthesis, the only component that must be added is the DNA template. Reactions are incubated at 28–30°C and are complete within 4 hours.

Proteins are expressed from genes cloned downstream of the T7 promoter. Companion vectors have been designed to achieve optimal yield with this system (pF25A and pF25K). They contain untranslated region (UTR) sequences at the 5´ and 3´ ends of the gene coding region to enhance translation efficiency. Using the TnT® T7 Insect Cell Extract Protein Expression System and these vectors, 75µg/ml of functional protein can be produced.

Features:

- **Obtain Data Faster:** Protein is expressed in only 4 hours, not days as with cell-based expression.
- **Complete System:** No requirement to purchase additional reagents.
- **Achieve High Protein Yields:** Express up to 75µg/ml of protein for multiple applications.

Storage Conditions: Store at –70°C.

TnT® SP6 High-Yield Wheat Germ Protein Expression System

Product	Size	Cat.#
TnT® SP6 High-Yield Wheat Germ Protein Expression System	40 reactions	L3260
	10 reactions	L3261
Available Separately		**Cat.#**
TnT® SP6 High-Yield Master Mix Minus Amino Acids		X808X

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® SP6 High-Yield Wheat Germ Protein Expression System, based on an optimized wheat germ extract, is a single-tube, coupled transcription/translation system designed to express proteins in only two hours. Protein synthesized, in the range of 10–100µg/ml, can be used in multiple proteomic-based applications, as well as in high-throughput analysis.

All components necessary for transcription/translation are provided in the extract, with the exception of the plasmid DNA or PCR template. Optional protein-labeling reagents must also be supplied by the user.

For custom wheat germ extract (depleted amino acids), order Cat.# X808X (see Products, Available Separately).

Features:

- **Save Time:** You can generate protein in only two hours, as compared to days when using cell-based (*E. coli*) systems.
- **Choose Your Format:** Use plasmid or PCR-generated templates to generate protein.
- **Achieve High Yields:** Generate 10- to 20-fold more protein (10–100µg/ml) when compared to other cell-free systems.
- **Generate Usable Protein:** Generate soluble, full-length protein and avoid problems associated with *E. coli* systems.

Storage Conditions: Store at –70°C.

TnT® Quick Coupled Transcription/Translation System

Product	Size	Conc.	Cat.#
TnT® T7 Quick Coupled Transcription/ Translation System	40 reactions		L1170
TnT® T7 Quick Coupled Transcription/ Translation System, Trial Size	5 reactions		L1171
TnT® SP6 Quick Coupled Transcription/ Translation System	40 reactions		L2080
TnT® SP6 Quick Coupled Transcription/ Translation System, Trial Size	5 reactions		L2081
Magnesium Acetate	100 µl	25 mM	L4581
Potassium Chloride	200 µl	2.5 M	L4591

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® Quick Systems are convenient single-tube, coupled transcription/translation reactions for eukaryotic cell-free protein expression. These cell-free expression systems combine the RNA Polymerase, nucleotides, salts, amino acids and Recombinant RNasin® Ribonuclease Inhibitor with the reticulocyte lysate solution to form a single TnT® Quick Master Mix.

The TnT® Quick Coupled Transcription/Translation System is available in two configurations for the expression of genes cloned downstream from either the T7 or SP6 RNA polymerase promoters. To use these cell-free expression systems, 0.2–2.0µg of circular plasmid DNA containing a T7 or SP6 promoter, or a PCR-generated fragment containing a T7 promoter, is added to an aliquot of the TnT® Quick Master Mix and incubated in a 50µl reaction volume for 60–90 minutes at 30°C. The expression reaction produces significant quantities of protein for a variety of applications including GST pull-downs and gel shift assays.

Features:

- **Obtain Data Faster:** Functional protein is expressed in only one hour, not days as with cell-based expression systems.
- **Multiple Applications with One System:** Use expressed protein for the characterization of protein:protein interaction, protein:nucleic acid interaction, protein modification and more.
- **Consistent, Reliable Results:** This mammalian-based system expresses soluble, functional proteins that are post-translationally modified, unlike *E. coli*-based systems.
- **Fewer Steps:** Expressed proteins can be used directly after expression; no requirement for additional purification.
- **Flexible Systems Available:** TnT® Systems for linear, circular or PCR templates are available.

Storage Conditions: Store at –70°C. Do not freeze-thaw the lysate more than two times.

TnT® Coupled Reticulocyte Lysate Systems

Product	Size	Cat.#
TnT® SP6 Coupled Reticulocyte Lysate System	40 reactions	L4600
TnT® SP6 Coupled Reticulocyte Lysate System, Trial Size	8 reactions	L4601
TnT® T7 Coupled Reticulocyte Lysate System	40 reactions	L4610
TnT® T7 Coupled Reticulocyte Lysate System, Trial Size	8 reactions	L4611
TnT® T3 Coupled Reticulocyte Lysate System	40 reactions	L4950
TnT® T7/T3 Coupled Reticulocyte Lysate System	40 reactions	L5010
TnT® T7/SP6 Coupled Reticulocyte Lysate System	40 reactions	L5020

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® Coupled Reticulocyte Lysate Systems offer researchers an alternative for eukaryotic cell-free protein expression: a single-tube, coupled transcription/translation system. The TnT® Lysate Systems greatly simplify the process and reduce the time required to obtain in vitro translation results. Standard rabbit reticulocyte lysate translations commonly use RNA synthesized in vitro from SP6, T3 or T7 RNA polymerase promoters and require three separate reactions with several steps between each reaction. The TnT® Systems bypass many of these steps by incorporating transcription directly in the translation mix.

For optimal protein expression using the TnT® SP6 RNA polymerase, we recommend titrating magnesium acetate in 0.1mM increments between 0.1mM and 0.5mM. In some instances the addition of 0.2mM magnesium acetate has been shown to increase protein expression by 40%. Magnesium acetate is supplied only with Cat.# L4600 and L4601.

Features:

- **Use in Multiple Applications:** The TnT® Systems are widely used for protein:protein interaction, protein:nucleic acid interactions, and more.
- **Save Time:** Using a one-tube reaction, proteins are generated in one hour, not days, as with in vivo methods.
- **Complete System:** All the reagents you need are provided (except radioisotopes).
- **Reliable:** Eliminate solubility issues by using an in vitro mammalian system.
- **Dependability You Can Count On:** The TnT® Systems are rigorously quality controlled to ensure the highest level of performance.

Storage Conditions: Store the polymerase at –20 to –70°C. Store Luciferase Assay Wells at room temperature. Store the other components at –70°C. Do not freeze-thaw the lysate more than two times.

Available in the Helix® on-site stocking system
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TnT® Coupled Wheat Germ Extract System

Product	Size	Cat.#
TnT® SP6 Coupled Wheat Germ Extract System	40 reactions	L4130
TnT® T7 Coupled Wheat Germ Extract System	40 reactions	L4140
TnT® T7/SP6 Coupled Wheat Germ Extract System	40 reactions	L5030

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TnT® Coupled Wheat Germ Extract Systems offer researchers an alternative for eukaryotic cell-free protein expression: a one-tube, coupled transcription/translation system. The TnT® Extract Systems greatly simplify the process and reduce the time required to obtain in vitro translation results. Standard wheat germ extract translations commonly use RNA synthesized in vitro from SP6 or T7 RNA polymerase promoters. This entire process requires separate reactions with several steps between each reaction. The TnT® Extracts bypass many of these steps by incorporating transcription directly in the translation mix. Additionally, the TnT® Extract reactions often produce significantly more protein (two- to sixfold) in a 1.5-hour reaction than do standard in vitro wheat germ extract translations using RNA templates.

Magnesium Acetate, 25mM, and Potassium Chloride, 2.5M, can be used to optimize in vitro translation reactions in the TnT® T7 Quick Coupled Transcription/Translation System, Flexi® Rabbit Reticulocyte Lysate System and TnT® Coupled Wheat Germ Extract System.

Features:

- **Reliable:** The TnT® Systems are rigorously quality controlled to ensure the highest level of transcription/translation, whether your template is a linear (T7 only) or circular plasmid.
- **Convenient:** Single-tube procedure eliminates the time and effort required to prepare RNA for a standard wheat germ translation. Translation results can be visualized by autoradiography in 6–8 hours.
- **Versatile:** The T7 system will produce protein from linear DNA. The SP6 system will produce protein from circular DNA. For PCR templates use TnT® T7 Quick for PCR DNA (Cat.# L5540).
- **Controls Included:** Luciferase Control DNA and Luciferase Assay Reagents are included with the system as functional controls. Only full-length luciferase is active.

Storage Conditions: Store the polymerase at –20°C. Store the Luciferase Assay Wells at room temperature. Store the other components at –70°C. Avoid multiple freeze-thaw cycles.

TnT® Starter Bundle

Product	Size	Cat.#
TnT® T7 Quick Starter Bundle, Chemiluminescent	1 each	L1210
TnT® T7 Quick Starter Bundle, Colorimetric	1 each	L1215

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Get the tools you need in one bundle to start cell-free expression and detection of your proteins of interest. Use the system for in vitro analysis of protein:protein or protein:nucleic acid interactions, or simply verify the ability of your clone to express protein. Purchase this bundle and get the popular TnT® T7 Quick Coupled Transcription/Translation System, your choice of Transcend™ Translation Detection System, and receive two cell-free expression-qualified expression vectors, pTnT™ and pCMVTnT™ Vectors, at no extra cost.

Features:

- **TnT® T7 Quick Coupled Transcription/Translation System:** Our most popular cell-free translation system—a simple one-hour, one-tube reaction. Requires only a protein coding sequence downstream of a T7 RNA polymerase promoter to produce protein. Produced protein may be used in a variety of applications including pull-downs, immunoprecipitations and gel shift assays. *TnT® T7 Quick Coupled Transcription/Translation System Technical Manual* #TM045.
- **Transcend™ Translation Detection Systems:** A simple addition of the Transcend biotin-labeled lysine tRNA to the TnT® T7 Quick reaction provides a simple means of tagging a protein for easy detection. Detect proteins through simple Western blotting techniques with either chemiluminescent or colorimetric techniques. *Transcend™ Translation Detection Systems Technical Bulletin* #TB182.
- **pTnT™ Vector:** Specifically designed to work with the TnT® Systems with added features to enhance cell-free expression. *pTnT™ Vector Technical Bulletin* #TB304.
- **pCMVTnT™ Vector:** Specifically designed to work with the TnT® Systems with added features to enhance cell-free expression. Go from cell-free expression to mammalian expression directly with built-in CMV promoter. *pCMVTnT™ Vector Technical Bulletin* #TB305.

Storage Conditions: Store the TnT® Quick System at –70°C. Do not freeze-thaw the lysate more than two times. Store the Transcend™ tRNA at –70°C. Do not subject the Transcend™ tRNA to more than five freeze-thaw cycles. Store all other Transcend™ System components at 4°C. Store the pTnT™ and pCMVTnT™ Vectors at –20°C.

pCMVTnT™ and pTnT™ Vectors

Product	Size	Cat.#
pTnT™ Vector	20 µg	L5610
pCMVTnT™ Vector	20 µg	L5620

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pCMVTnT™ and pTnT™ Vectors are designed for convenient expression of cloned genes in vitro or in vivo. SP6 and T7 promoters allow expression from SP6- or T7-based coupled in vitro transcription/translation systems. The presence of RNA phage promoters also allows highly efficient synthesis of RNA in vitro. Both vectors contain a 5′ β-globin leader sequence and synthetic poly(A)30 tail, which have been shown to enhance expression of certain genes.

For in vivo expression, the pCMVTnT™ Vector contains a CMV enhancer/promoter region, which allows strong constitutive expression in many cell types.

Features:

- **Flexible:** Tandem SP6 and T7 phage promoters allow use in the appropriate in vitro translation or transcription system.
- **Convenient:** Multiple cloning site provides a selection of restriction sites.
- **In Vivo Expression:** The CMV enhancer/promoter region in the pCMVTnT™ Vector allows strong constitutive expression in many cell types.

Storage Conditions: Store at –20°C.

TnT® T7 Quick for PCR DNA

Product	Size	Cat.#
TnT® T7 Quick for PCR DNA	40 reactions	L5540
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: TnT® T7 Quick for PCR DNA is a rapid, convenient, coupled transcription/translation system designed for optimum protein expression from PCR templates. For most PCR templates, the TnT® T7 Quick for PCR DNA reactions produce up to 5 times more protein than other commercially available kits. The PCR-generated DNA can be used directly from the amplification reaction or purified by numerous commercially available kits and traditional methods.

Features:

- **Convenient:** Directly from PCR, no cleanup necessary.
- **High Yield:** Up to 5 times more expressed protein than standard translation reactions with linear templates.
- **Quick:** One-tube reaction.
- **Complete:** Reagents including Recombinant RNasin® Ribonuclease Inhibitor are included in the Quick Master Mix.
- **Good Value:** One-tube format means no leftover reagents.
- **Reliable:** The TnT® Systems are rigorously quality controlled to ensure the highest level of transcription/translation.

Storage Conditions: Store at –70°C. Do not freeze-thaw the Master Mix more than two times.

Rabbit Reticulocyte Lysate System, Nuclease Treated

Product	Size	Cat.#
Rabbit Reticulocyte Lysate System, Nuclease Treated	30 reactions	L4960
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Rabbit Reticulocyte Lysate Translation Systems are utilized in the identification of mRNA species, the characterization of their protein products and the investigation of transcriptional and translational control. Rabbit Reticulocyte Lysate is prepared from New Zealand white rabbits using a standard protocol that ensures reliable and consistent reticulocyte production in each lot. After the reticulocytes are lysed, the extract is treated with micrococcal nuclease to destroy endogenous mRNA and thus reduce background translation to a minimum. The lysate contains the cellular components necessary for protein synthesis (tRNA, ribosomes, amino acids, initiation, elongation and termination factors).

Features:

- **Consistent:** Reliable and consistent translation with each lot.
- **Optimized and Ready to Use:** The treated Rabbit Reticulocyte Lysate is optimized for translation and contains an energy-regenerating system (phosphocreatine/phosphocreatine kinase), a mixture of tRNAs (to expand the range of mRNAs that can be translated), hemin (to prevent inhibition of initiation), and potassium chloride and magnesium acetate.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C or below. Do not freeze-thaw the lysate more than two times.

Flexi® Rabbit Reticulocyte Lysate System

Product	Size	Cat.#
Flexi® Rabbit Reticulocyte Lysate System	30 reactions	L4540
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Flexi® Rabbit Reticulocyte Lysate System allows translation reactions to be optimized for a wide range of parameters, including Mg^{2+} and K^+ concentrations and the choice of adding DTT. To help optimize Mg^{2+} for a specific message, the endogenous Mg^{2+} concentration of each lysate batch is stated in the product information included with this product. The Flexi® System also offers the choice of three amino acid mixtures and includes a control RNA encoding the firefly luciferase gene.

Features:

- **Improved Efficiency:** In an optimized system, the quantity of protein produced can be increased as much as fourfold over that of a standard lysate reaction.
- **Easy Optimization:** To aid in optimizing magnesium concentrations, the endogenous magnesium concentration is provided for each lot of Flexi® Lysate.
- **Choice:** The Flexi® System contains three Amino Acid Mixtures, which enable different choices of radioisotopes.
- **Control Included:** Luciferase Control RNA and Luciferase Assay Reagent are included with the system as a functional control. Only full-length luciferase is active.

Storage Conditions: Store at –70°C, except Luciferase Assay Wells, which can be stored at room temperature. Do not freeze-thaw the lysate more than two times.

Rabbit Reticulocyte Lysate/Wheat Germ Extract Combination System

Product	Size	Cat.#
Rabbit Reticulocyte Lysate/Wheat Germ Extract Combination System	24 reactions	L4330
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Rabbit Reticulocyte Lysate/Wheat Germ Extract Combination System contains both Rabbit Reticulocyte Lysate and Wheat Germ Extract for comparing in vitro translation systems. Reticulocyte Lysate is prepared from New Zealand white rabbits. The Wheat Germ Extract is prepared by grinding wheat germ in an extraction buffer followed by centrifugation to remove cellular debris. Both systems contain the cellular components necessary for protein synthesis. The systems have been treated with micrococcal nuclease, which destroys endogenous mRNA and results in minimal background translation.

Features:

- **Choice:** Test both Rabbit Reticulocyte Lysate and Wheat Germ Systems to find optimal translation systems.
- **Consistent:** Rigorous quality control ensures minimal lot-to-lot variability.
- **Optimal Expression:** Potassium Acetate is provided to enhance the Wheat Germ Extract System for a wide range of mRNAs.

Storage Conditions: Store at –70°C or below. Do not freeze-thaw the lysate more than two times.

Wheat Germ Extract

Product	Size	Cat.#
Wheat Germ Extract	5 × 200 µl	L4380

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Wheat Germ Extract contains the cellular components necessary for protein synthesis (tRNA, ribosomes, initiation, elongation and termination factors). Wheat Germ Extract is prepared by grinding wheat germ in an extraction buffer followed by centrifugation to remove cell debris. The supernatant is subjected to chromatography that separates endogenous amino acids and plant pigments from the extract. The extract is also treated with micrococcal nuclease to destroy endogenous mRNA and thus reduce background translation to a minimum.

Features:

- **Optimized:** Extract contains an energy-regenerating system (phosphocreatine/phosphocreatine kinase), spermidine (to stimulate the efficiency of chain elongation), magnesium acetate and potassium acetate.
- **Flexible:** Three Amino Acid Mixtures are provided, which enable different choices of radioisotopes.
- **Robust:** Potassium Acetate is provided to enhance translation for a wide range of mRNAs.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C or below. Avoid freeze-thaw cycles.

T7 Sample System

Product	Size	Cat.#
T7 Sample System	1 each	L5900

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The T7 Sample System is designed to facilitate the optimization of individual gene expression by offering four unique in vitro translation systems to evaluate. The system consists of samples of: TNT® T7 Quick for PCR DNA, TNT® T7 Quick Coupled Transcription/Translation System, TNT® Coupled Wheat Germ Extract System and *E. coli* T7 S30 Extract System for Circular DNA.

All of the coupled systems utilize RNA generated by a T7 phage promoter. Criteria such as post-translational modifications, ionic optimization and detection methods (i.e., non-isotopic) should be considered when choosing an in vitro system. In some cases only direct experimental results will confirm which system is best for specific genes.

Features:

- **Variety:** Four major in vitro translation systems to evaluate.
- **Value:** No requirement to purchase several large expensive systems.
- **Reliability:** Comprised of rigorously quality-controlled reagents to ensure the highest level of transcription/translation.
- **Optimization:** Determine which system is best for individual genes.

Storage Conditions: Store at –70°C.

Rabbit Reticulocyte Lysate, Untreated

Product	Size	Cat.#
Rabbit Reticulocyte Lysate, Untreated	1 ml	L4151

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Untreated Rabbit Reticulocyte Lysate contains the cellular components necessary for protein synthesis (tRNA, ribosomes, amino acids, initiation, elongation and termination factors) but has not been treated with micrococcal nuclease. Untreated Lysate is used primarily for the isolation of these components and as an abundant source of endogenous globin mRNA. Untreated Lysate is prepared from New Zealand white rabbits in the same manner as treated lysates with the exception that it is not treated with micrococcal nuclease.

Features:

- **Reliable:** Consistent reticulocyte production in each lot.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C or below.

Luciferase Control RNA

Product	Size	Conc.	Cat.#
Luciferase Control RNA	20 µg	1 mg/ml	L4561

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase Control RNA is a unique functional control for in vitro translation reactions. Luciferase Control RNA is an uncapped in vitro-transcribed RNA containing a 30-base poly(A) tail that produces functional luciferase when translated. Control reactions are monitored easily by a luciferase assay for the production of luminescence generated from the full-length luciferase.

Features:

- **Convenient:** Control reactions are easily monitored by a luciferase assay for luminescence.
- **Safe:** Non-radioactive format to monitor control activity.

Storage Conditions: Store at –70°C.

Luciferase SP6/T7 Control DNAs

Product	Size	Cat.#
Luciferase SP6 Control DNA	20 µg	L4741
Luciferase T7 Control DNA	20 µg	L4821

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Luciferase SP6 and T7 Control DNAs are used as functional controls in the TNT® Quick Coupled and TNT® Coupled Transcription/Translation Systems. The Control DNAs contain the gene for luciferase under transcriptional control of a phage RNA polymerase promoter. All constructs carry a 30-base pair poly[d(A)/d(T)] tail following the luciferase gene. Control reactions are monitored easily by the production of luminescence, which is generated from full-length luciferase and the addition of necessary components. Luciferase Control DNAs are supplied as 0.5mg/ml solutions in TE buffer.

Storage Conditions: Store at –20°C.

Canine Pancreatic Microsomal Membranes

Product	Size	Cat.#
Canine Pancreatic Microsomal Membranes	50 µl	Y4041
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Microsomal vesicles are used to study co-translational and initial post-translational processing of proteins. Processing events such as signal peptide cleavage, membrane insertion, translocation and core glycosylation can be examined by the translation of the appropriate mRNA in vitro in the presence of these microsomal membranes. In addition, processing and glycosylation events may be studied by the transcription/translation of the appropriate DNA in the TNT® Lysate Systems when used with Canine Pancreatic Microsomal Membranes. To assure consistent performance with minimal translational inhibition and background, microsomes have been isolated free from contaminating membrane fractions and stripped of endogenous membrane-bound ribosomes and mRNA. Membrane preparations are assayed for both signal peptidase and core glycosylation activities using two different control mRNAs. The two control mRNAs supplied with this system are the precursor for β-lactamase (or ampicillin resistance gene product) from *E. coli* and the precursor for α-mating factor (or α-factor gene product) from *S. cerevisiae.*

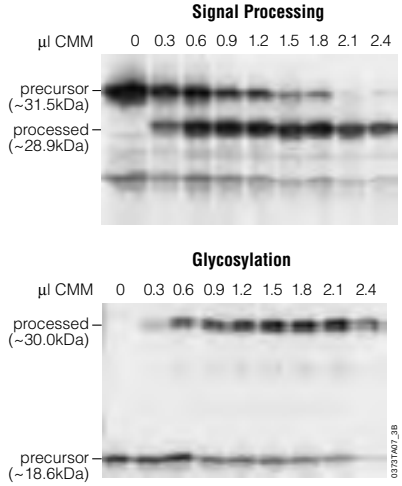
The Signal Sequence Control mRNA (*E. coli* β-lactamase) is transcribed by SP6 RNA polymerase from a plasmid bearing the coding region for the *E. coli* gene encoding the precursor to β-lactamase (the ampicillin resistance gene product). The RNA is synthesized without a cap analog. This control mRNA is used to assay for signal peptidase activity and is supplied with the Canine Pancreatic Microsomal Membranes System.

The Core Glycosylation Control mRNA (*S. cerevisiae* α-factor) is transcribed by SP6 RNA polymerase from a plasmid bearing the coding region for the *S. cerevisiae* α-mating factor. The RNA is synthesized without a cap analog. This control mRNA is used to assay for core glycosylation activity and is supplied with the Canine Pancreatic Microsomal Membranes System.

Features:

- **Reliable:** Microsomes are stripped of endogenous membrane-bound ribosomes and mRNA to ensure consistent performance with minimal translational inhibition and background. Performance tested in rabbit reticulocyte lysate.

Storage Conditions: Store at –70°C or below. Membranes are stable at –70°C for 1 year. After thawing, unused portions should be rapidly refrozen in liquid nitrogen. No detectable loss of activity results after two freeze-thaw cycles.



Processing and glycosylation activity of Canine Pancreatic Microsomal Membranes (CMM). The positive control mRNAs (0.5µg each of *E. coli* β-lactamase and *S. cerevisiae* α-factor) were translated using Rabbit Reticulocyte Lysate in a 25µl reaction for 60 minutes in the presence of the indicated amounts of CMM (3µl). Translation products were analyzed by gel electrophoresis followed by autoradiography of the [^{35}S]-labeled proteins.

Amino Acid Mixtures

Product	Size	Conc.	Cat.#
Amino Acid Mixture, Complete	175 µl	1 mM	L4461
Amino Acid Mixture Minus Cysteine	175 µl	1 mM	L4471
Amino Acid Mixture Minus Methionine and Cysteine	175 µl	1 mM	L5511
Amino Acid Mixture Minus Leucine	175 µl	1 mM	L9951
Amino Acid Mixture Minus Methionine	175 µl	1 mM	L9961
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The Amino Acid Mixture, Complete, is an aqueous solution containing 1mM each of the 20 essential amino acids. This mixture is compatible for use in the Flexi® Lysate, TNT® Lysate and standard Rabbit Reticulocyte Lysate Systems as well as in the Wheat Germ Extract and *E. coli* S30 Systems. Amino Acid Mixtures are also available lacking cysteine, methionine and cysteine, leucine or methionine.

Storage Conditions: Store at –70°C.

Prokaryotic Cell-Free Protein Expression

S30 T7 High-Yield Protein Expression System

Product	Size	Cat.#
S30 T7 High-Yield Protein Expression System	24 reactions	L1110
	8 reactions	L1115
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The *E. coli* S30 T7 High-Yield Protein Expression System is designed to express up to 500µg/ml of protein in 1 hour from plasmid vectors containing a T7 promoter and a ribosome binding site. The protein expression system provides an extract that contains T7 RNA polymerase for transcription and is deficient in OmpT endoproteinase and Ion protease activity. All other necessary components in the system are optimized for protein expression. This results in greater stability and enhanced expression of target proteins.

Features:

- **Obtain Data Faster:** Protein expression in only one hour, not days as with cell-based expression.
- **Complete System:** No requirement to purchase additional reagents.
- **Achieve High Protein Expression:** Express up to 500µg/ml of protein for multiple applications.
- **Scalable:** Convenient screening protocol for high-throughput protein expression.
- **Flexible:** Detect expressed proteins by Coomassie® staining or incorporation of a fluorescence or biotinylated modified tRNA.

Storage Conditions: Store at –70°C.

Available in the Helix® on-site stocking system
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E. coli T7 S30 Extract System for Circular DNA

Product	Size	Cat.#
E. coli T7 S30 Extract System for Circular DNA	30 reactions	L1130
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The *E. coli* T7 S30 Extract System for Circular DNA simplifies the transcription/translation of DNA sequences cloned in plasmid or λ vectors containing a T7 promoter by providing an extract that contains T7 RNA polymerase for transcription and all components needed for translation. The investigator only supplies cloned DNA containing a T7 promoter and a ribosome binding site. This product is prepared by modifications of the method described by Zubay from an *E. coli* strain B deficient in *Omp*T endoproteinase and *lon* protease activity. This results in greater stability of expressed proteins that would otherwise be degraded by proteases if expressed in vivo.

Features:

- **Flexible:** Can translate using any clone that has a T7 promoter and a ribosome binding site. Other S30 extracts require an *E. coli* promoter.
- **Greater Stability:** Reduced chance of expressed proteins degrading.
- **Complete:** Contains all components needed for coupled transcription/translation.
- **Low Background:** Synthesizes very low levels of endogenous proteins.
- **Optimized:** Premix is optimized for each lot of S30 Extract and contains all other required components (except amino acids), such as ribonucleotides, tRNAs, PEP (phosphoenol pyruvate) and salts.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store extract at –70°C. Check individual components for storage temperatures.

E. coli S30 Extract System for Linear Templates

Product	Size	Cat.#
E. coli S30 Extract System for Linear Templates	30 reactions	L1030
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The *E. coli* S30 Extract System for Linear Templates is prepared using minor modifications of the protocol described by Lesley and colleagues and allows successful transcription/translation of linear DNA templates. The investigator need only provide linear DNA containing a prokaryotic *E. coli*-like promoter (such as *lac*UV5, *tac*, λPL (con) and λ-P_R). A ribosome binding site is required to direct the synthesis of proteins in vitro. In vitro-generated RNA from DNA templates lacking an *E. coli* promoter may also be used in this system, but protein yields will be decreased to 1–10% of that produced from linear DNA templates.

Features:

- **Flexible:** Many templates can be used: DNA fragments, PCR-synthesized DNA, ligated overlapping oligonucleotides, in vitro-generated RNA and prokaryotic RNA.
- **Greater Stability:** Reduced chance of expressed proteins degrading.
- **Complete:** Contains all necessary components for coupled transcription/translation.
- **Low Background:** System synthesizes very low levels of endogenous proteins.
- **Optimized:** Premix is optimized for each lot of S30 Extract and contains all other required components (except amino acids), such as ribonucleotides, tRNAs, PEP (phosphoenol pyruvate) and salts.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C.

E. coli S30 Extract System for Circular DNA

Product	Size	Cat.#
E. coli S30 Extract System for Circular DNA	30 reactions	L1020
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The *E. coli* S30 Extract for Circular DNA simplifies the transcription/translation of DNA sequences cloned in plasmid or λ vectors, providing a powerful tool for identifying and characterizing polypeptides. The investigator needs only to supply the cloned DNA containing the appropriate prokaryotic promoter and ribosome binding sites. The S30 Extract for Circular DNA Templates is prepared by modifications of the method described by Zubay from an *E. coli* strain B deficient in *Omp*T endoproteinase and *lon* protease activity. This results in a greater stability of expressed proteins that would otherwise be degraded by proteases if expressed in vivo. The S30 in vitro system also allows higher expression levels of proteins that are normally expressed at low levels in vivo due to the action of host-encoded repressors.

Features:

- **Greater Stability:** Reduced chance of expressed proteins degrading.
- **Complete:** Contains all necessary components for coupled transcription/translation.
- **Low Background:** System synthesizes very low levels of endogenous proteins.
- **Optimized:** Premix is optimized for each lot of S30 Extract and contains all other required components (except amino acids), such as ribonucleotides, tRNAs, PEP (phosphoenol pyruvate) and salts.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C.

pGEM® β-Gal Control DNA

Product	Size	Cat.#
pGEM® β-Gal Control DNA	20 µg	L4731
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: pGEM® β-Gal Control DNA contains the coding sequence of β-galactosidase downstream of an *E. coli* wildtype *lac*Z promoter. pGEM® β-Gal Control DNA can be used as a positive control in the *E. coli* S30 Extract System for Circular DNA. The wildtype *lac*Z promoter is not efficient for initiating transcription from a linear DNA template. Supplied as a 0.5mg/ml solution in TE buffer.

Storage Conditions: Store at –20°C.

Regulated Mammalian Expression System

Product	Size	Cat.#
Regulated Mammalian Expression System	1 system	C9470
Coumermycin A1	5 mg	C9451
Novobiocin Sodium Salt	1 g	C9461
Available Separately	**Size**	**Cat.#**
pReg neo Vector	20 µg	C9421
pF12A RM Flexi® Vector	20 µg	C9431
pF12K RM Flexi® Vector	20 µg	C9441

C9421, C9470, C9431, C9451, C9441 For Research Use Only. Not for Use in Diagnostic Procedures. C9461 For Research Use Only. Not for Use in Therapeutic or Diagnostic Procedures.

Description: The Regulated Mammalian Expression System features low basal levels, robust and rapid induction, and downregulation of gene expression in mammalian cells. The Regulated Mammalian Expression System is based on a novel on/off switch that relies on the rapid and sensitive modulation by coumerin-related compounds of a chimeric transactivator protein. Nanomolar concentrations of the antibiotic coumermycin promote homodimerization of a chimeric transactivator that, in turn, binds to lambda operator sequences located upstream of a minimal promoter driving transcription of coding sequences for a protein of interest. The levels of protein expression can be regulated by adjusting the coumermycin concentration. More significantly, this expression can be promptly and effectively switched off by adding novobiocin, which acts as an antagonist by dissociating the dimerized transactivator protein.

The protein coding region of interest is cloned into either the pF12A RM Flexi® Vector or pF12K RM Flexi® Vector, both of which are specially designed for Regulated Mammalian (RM) protein expression. These vectors incorporate regulatory promoter sequences upstream of the protein-coding region and are compatible with the Flexi® Vector System. In transient transfection paradigms, the pF12A or pF12K RM Flexi® Vector containing the protein-coding region of interest is co-transfected into mammalian cells together with the pReg neo Vector. The pReg neo Vector is designed to express a chimeric transactivator protein that interacts with the regulatory promoter region in the pF12A and pF12K RM Flexi® Vectors in a regulated fashion in response to coumermycin and novobiocin. Additionally, the pReg neo Vector encodes a neomycin phosphotransferase gene that allows stable cell selection and generation with the antibiotic G-418.

Features:

- **Enhanced Data:** High level of controlled induction combined with low basal protein expression.
- **Regulated Expression:** Dose-response induction of protein expression; rapid and sensitive on/off switch for protein expression.
- **Versatility:** Compatible with other Flexi® Vectors.

Storage Conditions: Store at –20°C.

Single Step (KRX) Competent Cells

Product	Size	Cat.#
Single Step (KRX) Competent Cells	20 × 50 µl	L3002
L-Rhamnose Monohydrate	10 g	L5701
	50 g	L5702

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Single Step (KRX) Competent Cells are designed for efficient transformation and tightly controlled protein expression. These cells consolidate the best attributes of these two steps into one strain to evaluate protein expression in *E. coli.*

Transformation efficiencies are greater than 10^8 cfu/µg, similar to other highly competent cells. The single step cells are available in single transformation size (50µl). KRX also can be used for blue/white screening.

Single Step (KRX) is an *E. coli* K strain that contains a chromosomal copy of the T7 RNA polymerase driven by a rhamnose promoter (rhaBAD) to provide dramatic control of the proteins expressed via a T7 promoter. Pre-induced expression protein levels are significantly lower than those of BL21(DE3)-derived strains. This feature facilitates cloning and expression of proteins toxic to *E. coli.*

Genotype: [F´, *tra*D36, Δ*ompP*, *pro*A^+B^+, *lacI*^{q}, Δ(*lacZ*)M15] Δ*ompT*, *end*A1, *rec*A1, *gyr*A96 (Nal^r), *thi*-1, *hsd*R17 (r_k^-, m_k^+), e14$^-$ (McrA$^-$), *rel*A1, *sup*E44, Δ(*lac-pro*AB), Δ(*rha*BAD)::T7 RNA polymerase.

Features:

- **Save Time:** In two days, you can transform your vector into the Single Step (KRX) Competent Cells and be ready for protein expression.
- **Controlled Protein Expression:** For overall expression of cloned proteins, the Single Step (KRX) Competent Cells provide dramatic control of expressed protein-coding regions.
- **Achieve High Yields:** Protein expression levels were shown to be as high as or higher than levels expressed in BL21(DE3)-derived strains.
- **Blue/White Screening:** Convenient method for detecting recombinant clones.

Storage Conditions: Always store competent cells at –70°C. Thaw on ice when ready for use. Do not refreeze thawed, unused aliquots.

BL21(DE3)pLysS Competent Cells

Product	Size	Cat.#
Single-Use BL21(DE3)pLysS Competent Cells	1 ml	L1195
BL21(DE3)pLysS Competent Cells, >10^6cfu/µg	1 ml	L1191

For Research Use Only. Not for Use in Diagnostic Procedures.

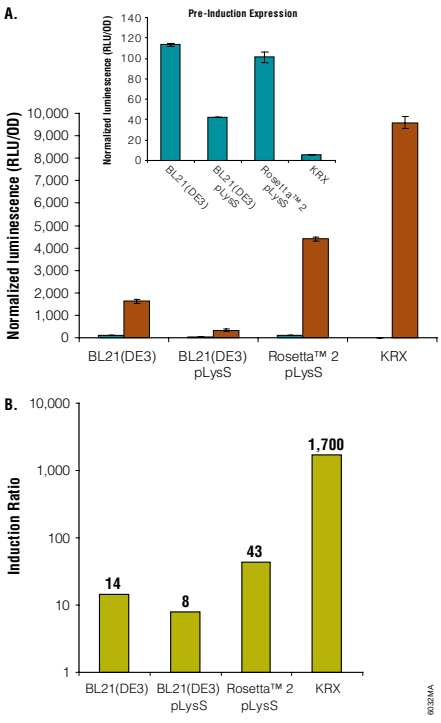
Description: BL21(DE3)pLysS Competent Cells allow high-efficiency protein expression of any gene that is under the control of a T7 promoter and has a ribosome binding site. BL21(DE3)pLysS is lysogenic for λ-DE3, which contains the T7 bacteriophage gene I, encoding T7 RNA polymerase under the control of the *lac* UV5 promoter. BL21(DE3)pLysS also contains a plasmid, pLysS, which carries the gene encoding T7 lysozyme. T7 lysozyme lowers the background expression level of target genes under the control of the T7 promoter but does not interfere with the level of expression achieved following induction by IPTG. For researchers doing more than one transformation, competent cells are available in standard format (200µl aliquots). For added convenience, single-use competent cells (50µl aliquots) also are offered.

Genotype: F–, *ompT*, *hsdS*$_B$ (r_B–, m_B–), *dcm*, *gal*, λ(DE3), pLysS, Cm^r.

Features:

- **T7 RNA Polymerase Under the Control of the lac** UV5 Promoter: Inducible protein expression.
- **Deficient in Proteases lon and OmpT:** Increased stability of expressed protein.
- **pLysS Plasmid:** Lower background expression of target genes.

Storage Conditions: Store at –70°C.



Pre-induction and post-induction expression levels of firefly luciferase. Cells were transformed with the pF1K T7 Flexi® Vector containing the firefly luciferase gene. Cultures were grown at 37°C to an optical density ($O.D._{600}$) of 0.8–1.0 and then moved to a 25°C incubator shaker. When cultures reached an $O.D._{600}$ of 1.0–1.5, protein expression was induced using either 0.1% rhamnose or 1mM IPTG and grown overnight at 25°C. Samples for luciferase assays were removed prior to and after induction. **Panel A.** Firefly luciferase expression level was determined using the Bright-Glo™ Luciferase Assay Reagent. Pre- and post-induction firefly luciferase expression levels were normalized to cell number (n = 3). **Panel B.** Induction ratios were calculated by dividing the post-induction luminescence values by the pre-induction values.

Proteases and Services for Mass Spectrometry

Glycosidases

Product	Size	Conc.	Cat.#
Endo H	10,000 units	500 u/µl	V4871
	50,000 units	500 u/µl	V4875
Protein Deglycosylation Mix	20 reactions		V4931
Fetuin	500 µg	10 mg/ml	V4961
PNGase F	500 units	10 u/µl	V4831

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Endoglycosidase H (Endo H) is a recombinant glycosidase cloned from *Streptomyces plicatus* and overexpressed in *E. coli*. Endo H cleaves the chitobiose core of high mannose and a limited number of hybrid oligosaccharides from N-linked glycoproteins. It does not cleave complex glycans. Enzymatic cleavage is between the two N-acetylglucosamine residues in the diacetylchitobiose core of the oligosaccharide, leaving one N-acetylglucosamine residue on the asparagine. This is in contrast to PNGase F, which cleaves all asparagine-linked oligosaccharides.

Protein Deglycosylation Mix is a mixture of five protein deglycosidases (PNGase F, O-Glycosidase, Neuraminidase, β1-4 Galactosidase, β-N-Acetylglucosaminidase) capable of removing glycans from both O-linked and N-linked glycosylation sites. Fetuin is provided as a deglycosylation substrate control.

Fetuin is a glycoprotein with O-linked and N-linked glycosylation sites.

PNGase F is a recombinant glycosidase cloned from *Elizabethkingia miricola* and overexpressed in *E. coli*. PNGase F has a molecular weight of 36kDa. For additional information about PNGase F, visit the PNGase F page.

Storage Conditions: Store Endo H and Fetuin at –30 to –10°C. Store Protein Deglycosylation Mix at 2–10°C.

PNGase F

Product	Size	Conc.	Cat.#
PNGase F	500 units	10 u/µl	V4831

For Research Use Only. Not for Use in Diagnostic Procedures.

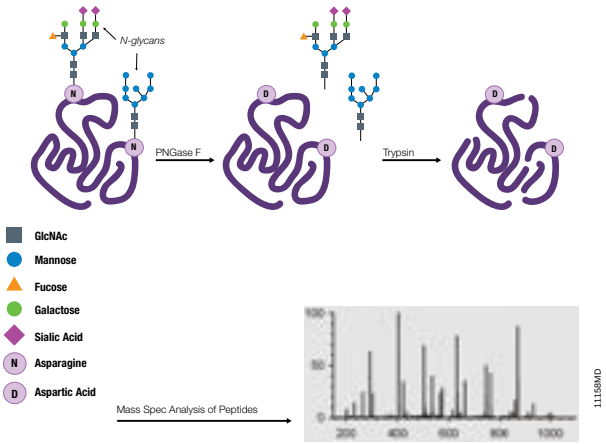
Description: PNGase F is a recombinant glycosidase cloned from *Elizabethkingia miricola* and overexpressed in *E. coli*. PNGase F has a molecular weight of 36kDa. PNGase F catalyzes the cleavage of N-linked oligosaccharides between the innermost GlcNAc and asparagine residues of high mannose, hybrid and complex oligosaccharides from N-linked glycoproteins (Figure 1). PNGase F will not remove oligosaccharides containing Alpha-(1,3)-linked core fucose commonly found on plant glycoproteins.

Unit Definition: One unit of PNGase F will catalyze the deglycosylation of 1 nanomole of denatured Ribonuclease B (RNase B) in one minute at 37°C. One Promega unit is equal to 1 IUB milliunit.

Molecular Weight: PNGase F has a molecular weight of approximately 36kDa.

Physical Form: PNGase F is supplied as a liquid in 20mM Tris-HCl (pH 7.5 at 25°C), 50mM NaCl and 5mM EDTA at a concentration of 10,000u/ml.

Storage Conditions: Store at 2–10°C.



Schematic illustrating the use of PNGase F and mass spec analysis of N-glycosylation.

ProTEV Plus

Product	Size	Conc.	Cat.#
ProTEV Plus	1,000 u	5 u/µl	V6101
	8,000 u	5 u/µl	V6102

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ProTEV Plus is an improved 48kDa version of the Nla protease from tobacco etch virus (TEV) that has been engineered to be more stable than native TEV protease for prolonged enzymatic activity. It is a highly specific proteolytic enzyme that cleaves within a seven-amino-acid sequence (ENLYFQ(G/S)). ProTEV Plus is active over a wide range of pH values (5.5–8.5) and temperatures (4–30°C). It can be used to cleave protein fusions that have been engineered with the above amino acid sequence at the desired cleavage site. The enzyme is compatible for both in-solution and on-column cleavage reactions. ProTEV Plus also contains an HQ tag (analogous to His tag) located at the N-terminus of the protein, which allows it to be immobilized on Ni-based affinity resins and removed from the cleavage reaction.

Learn more about our custom options for this product at:
www.promega.com/custom/

Features:

- **Active Over a Wide Range of pH and Temperatures:** Cleave individual fusion proteins using optimal conditions to maintain activity and correct conformation.
- **HQ-Tagged:** Convenient removal of ProTEV Plus using Ni-based affinity resins after cleavage.
- **Specific:** Highly specific and active for its seven-amino acid sequence with minimal off-target effects.
- **Cleaves Fusion Proteins Directly in Solution or Immobilized on Affinity Resins:** ProTEV Plus is easy to use in multiple experimental formats.

Storage Conditions: Store at –20°C.

Trypsin/Lys-C Mix, Mass Spec Grade

Product	Size	Cat.#
Trypsin/Lys-C Mix, Mass Spec Grade	20 µg	V5071
	100 µg	V5072
	100 µg	V5073

For Research Use Only. Not for Use in Diagnostic Procedures.

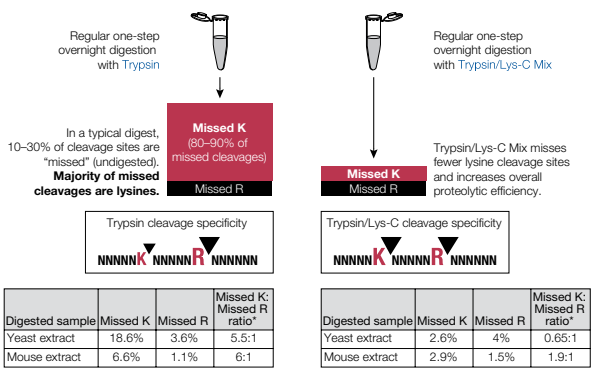
Description: Trypsin/Lys-C Mix, Mass Spec Grade, is a mixture of Trypsin Gold, Mass Spectrometry Grade, and rLys-C, Mass Spec Grade. The Trypsin/Lys-C Mix is designed to improve digestion of proteins or protein mixtures in solution.

Using the conventional trypsin digestion protocol (i.e., overnight incubation at nondenaturing conditions), Trypsin/Lys-C Mix improves protein digestion by eliminating the majority of missed cleavages, which occur at prominent quantities in trypsin digests. Trypsin/Lys-C Mix enhances digestion and compensates for the trypsin proteolytic inefficiency at lysine sites. Replacing trypsin with Trypsin/Lys-C Mix in this conventional protocol leads to multiple benefits for protein analysis including more accurate mass spectrometry-based protein quantitation and improved protein mass spectrometry analytical reproducibility. Trypsin/Lys-C Mix also provides greater tolerance to trypsin-inhibiting agents, assuring efficient digestion of proteins for which protein purification is limited or not feasible.

Features:

- **Simple to Use:** Use standard overnight digestion with nondenaturing conditions.
- **Enhanced Proteolysis:** Increase peptide recovery, resulting in enhanced protein quantitation and improved reproducibility and eliminating the majority of missed cleavages.
- **Tolerant to Trypsin-Inhibiting Contaminants:** Generate mass spectrometry data from poor-quality sample material.

Storage Conditions: Store Trypsin/Lys-C Mix, Mass Spec Grade, at –30°C to –10°C.



Digested sample	Missed K	Missed R	Missed K: Missed R ratio*
Yeast extract	18.6%	3.6%	5.5:1
Mouse extract	6.6%	1.1%	6:1

Digested sample	Missed K	Missed R	Missed K: Missed R ratio*
Yeast extract	2.6%	4%	0.65:1
Mouse extract	2.9%	1.5%	1.9:1

*Similar ratios of missed lysine and arginine cleavage sites were observed in Trypsin and Trypsin/Lys-C digests of extracts prepared from other sources including human and *E. coli*.

Side-by-side comparison of cleavage sites missed by trypsin or the Trypsin/Lys-C Mix using a standard digestion protocol.

Available in the Helix® on-site stocking system

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ProteaseMAX™ Surfactant, Trypsin Enhancer

Product	Size	Cat.#
ProteaseMAX™ Surfactant, Trypsin Enhancer	1 mg	V2071
	5 × 1 mg	V2072

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ProteaseMAX™ Surfactant, Trypsin Enhancer, improves in-gel and in-solution protein digestion. ProteaseMAX™ Surfactant ensures fast and efficient protein digestion with proteases such as Trypsin, Chymotrypsin and Lys-C. For in-gel protein digestion, ProteaseMAX™ Surfactant offers time and labor savings. Digestion step is complete in 1 hour, and the surfactant provides concurrent extraction of peptides from gels, eliminating the need for post-digestion peptide extraction. The surfactant also improves recovery of longer peptides that are retained in the gel under a standard extraction protocol.

For in-solution digestions, ProteaseMAX™ Surfactant solubilizes proteins, including difficult proteins (i.e., membrane proteins), and enhances protein digestion by providing a denaturing environment prior to protease addition.

ProteaseMAX™ Surfactant degrades over the course of a digestion reaction, yielding products that are compatible with downstream methods such as mass spectrometry and liquid chromatography. No long-term negative effect of the residual surfactant on the ion optics and capillary of mass spectrometers has been observed. ProteaseMAX™ Surfactant can be used with existing in-gel or in-solution digestion protocols.

Features:

- **No Peptide Extraction Required Following In-Gel Digestions:** Save time and increase the number of samples processed.
- **Improved Peptide Recovery from Gels:** Increase protein sequence coverage, thus increasing confidence of protein identification.
- **Enhanced Protein Solubilization:** Solubilize complex proteins, such as membrane proteins, at room temperature, avoiding high temperature and preventing precipitation.
- **Degrades Over Course of Digestion:** Samples are ready for use directly for mass spectrometry analysis without additional inactivation steps such as heating or acid treatment.

Storage Conditions: Store lyophilized ProteaseMAX™ Surfactant at –20°C.

Immobilized Trypsin

Product	Size	Cat.#
Immobilized Trypsin	2 ml	V9012
	4 ml	V9013

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Immobilized Trypsin provides a fast and convenient method for digesting a range of concentrations of purified protein or complex protein mixtures. Digested peptides are easily separated from the Immobilized Trypsin as they flow through the spin column into the collection tube. Immobilized Trypsin is easily removed from the peptide solution because the trypsin does not pass though the column frit. Trypsin is a proteolytic enzyme, which cleaves at the carboxyl side of positively charged Lysine (Lys) and Arginine (Arg). When these amino acids are followed by the nonpolar Proline (Pro), the digestion of the site is not efficient. When Lys and Arg are followed by acids [Aspartic Acid (Asp) and Glutamic Acid (Glu)] the digestion is also not as efficient.

Features:

- **Fast:** Digestions can be accomplished in as little as 30 minutes.
- **Scalable:** Easily adjustable protocol to accommodate various protein concentrations.
- **Easy-to-Use:** No shaking or water baths necessary.

Storage Conditions: Store at 4°C.

Chymotrypsin, Sequencing Grade

Product	Size	Cat.#
Chymotrypsin, Sequencing Grade	25 µg	V1061
	100 µg	V1062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Chymotrypsin is a highly-purified serine endopeptidase derived from bovine pancreas that preferentially hydrolyzes at the carboxyl side of aromatic amino acids: Tyr, Phe and Trp. Cleavage may also be observed, but at a lower rate, at Leu and Met. Chymotrypsin activity is optimal in the pH range of 7.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in-solution or in-gel.

Storage Conditions: Store at 4°C.

Trypsin Gold, Mass Spectrometry Grade

Product	Size	Cat.#
Trypsin Gold, Mass Spectrometry Grade	100 µg	V5280
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Trypsin Gold, Mass Spectrometry Grade, is manufactured to provide maximum specificity. Lysine residues in the porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion. The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography and lyophilized to yield Trypsin Gold, Mass Spectrometry Grade. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Each lot of quality-tested Trypsin Gold, Mass Spectrometry Grade, is qualified for use with in-gel digestion and mass spectrometric analysis.

Learn more about our custom options for this product at:
www.promega.com/custom/

Features:

- **Each Lot Qualified by Mass Spectrometry:** Ensures compatibility with customer applications/instrumentation.
- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability Ensured up to Five Freeze-Thaw Cycles:** Minimize leftover reagents.
- **Referenced in Thousands of Papers:** Reliable and customer proven.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the lyophilized powder at –20°C. Reconstitute powder in 50mM acetic acid and store at –20°C. For long-term storage, freeze reconstituted trypsin at –70°C. Limit the number of freeze-thaw cycles to five.

Sequencing Grade Modified Trypsin

Product	Size	Cat.#
Sequencing Grade Modified Trypsin	100 µg	V5111
	100 µg	V5117
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Sequencing Grade Trypsin has been manufactured to provide maximum specificity. Lysine residues in the porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion.

The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography and lyophilized. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Choose Your Configuration: Learn more about our custom options for this product at: **www.promega.com/custom/**

Recommended Reaction Buffer: 50mM NH_4HCO_3 (pH 7.8).

Features:

- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability:** Ensured up to five freeze-thaw cycles.
- **Reliable and Customer-Proven:** Referenced in thousands of papers.
- **Alternative Formats:** Flexibility depending on experimental design and scope.

Storage Conditions: Store lyophilized at –20°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

Sequencing Grade Modified Trypsin, Frozen

Product	Size	Cat.#
Sequencing Grade Modified Trypsin, Frozen	100 µg	V5113

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Trypsin is a serine protease that specifically cleaves at the carboxylic side of lysine and arginine residues. The stringent specificity of trypsin is essential for protein identification. Native trypsin is subject to autolysis, generating pseudotrypsin, which exhibits a broadened specificity including a chymotrypsin-like activity. Such autolysis products, present in a trypsin preparation, would result in additional peptide fragments that could interfere with database analysis of the mass of fragments detected by mass spectrometry. Sequencing Grade Trypsin has been manufactured to provide maximum specificity. Lysine residues in the porcine trypsin have been modified by reductive methylation, yielding a highly active and stable molecule that is extremely resistant to autolytic digestion.

The specificity of the purified trypsin is further improved by TPCK treatment, which inactivates chymotrypsin. The treated trypsin is then purified by affinity chromatography. It is resistant to mild denaturing conditions such as 0.1% SDS, 1M urea or 10% acetonitrile and retains 50% of its activity in 2M guanidine HCl. The activity of trypsin is decreased when acidic residues are present on either side of a susceptible bond. If proline is at the carboxylic side of lysine or arginine, the bond is almost completely resistant to cleavage.

Sequencing Grade Modified Trypsin, Frozen, is supplied in convenient 20µg aliquots as a frozen liquid in 50mM acetic acid.

Recommended Reaction Buffer: 50mM NH_4HCO_3 (pH 7.8).

Features:

- **TPCK Treatment Followed by Affinity Purification:** Elimination of chymotrypsin activity enables distinct and consistent data.
- **Stability:** Ensured up to five freeze-thaw cycles.
- **Reliable and Customer-Proven:** Referenced in thousands of papers.

Storage Conditions: Store at –70°C.

Endoproteinase Lys-C, Sequencing Grade

Product	Size	Cat.#
Endoproteinase Lys-C, Sequencing Grade	5 µg	V1071

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Endoproteinase Lys-C is a sequencing grade serine protease isolated from Lysobacter enzymogenes as a highly purified protease that hydrolyzes specifically at the carboxyl side of Lys. Lys-C activity is optimal in the pH range of 7.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in-solution or in-gel.

Storage Conditions: Store at 4°C.

rLys-C, Mass Spec Grade

Product	Size	Cat.#
rLys-C, Mass Spec Grade	15 µg	V1671

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: rLys-C, Mass Spec Grade, is a recombinant Lys-C expressed in *E. coli*. Sequence origin of rLys-C is Protease IV from *Pseudomonas aeruginosa*. Similar to a native Lys-C, rLys-C cleaves at the carboxyl side of lysine residues with exceptional specificity. rLys-C retains proteolytic activity under protein denaturing conditions such as 8M urea, which is used to improve digestion of proteolytically resistant proteins. rLys-C activity is optimal in the pH range of 8–9. The protease is supplied in a lyophilized form along with a Reconstitution Buffer, which is formulated to increase stability of rLys-C solution. Frozen rLys-C solution can be stored for a month at –20ºC without detectable loss of activity. rLys-C is recommended for digestion of single proteins and complex protein mixtures in-solution and in-gel.

Features:

- **Competitive Performance:** Matches cleavage specificity of a native Lys-C. Proteolytic activity is similar.
- **Purity:** No contaminating peptides are identified with reverse-phase HPLC.
- **Application-Qualified:** Each lot is qualified by mass spectrometry.
- **Tolerance to Protein Denaturing Conditions:** Retains activity in 8M urea.
- **Cost-Effective:** Severalfold price reduction as compared to a native Lys-C.

Storage Conditions: Store at –20°C.

Arg-C, Sequencing Grade

Product	Size	Cat.#
Arg-C, Sequencing Grade	10 µg	V1881
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Arg-C (clostripain) is an endopeptidase that cleaves at the C-terminus of arginine residues, including the sites next to proline. Cleavage also will occur at lysine residues. This sequencing grade enzyme can be used alone or in combination with other proteases for protein analysis by mass spectrometry and other applications. Arg-C activity is optimal in the pH range of 7.6–7.9.

Storage Conditions: Store at 2–10°C.

Comparative proteases and cleavage sites.

Asp-N, Sequencing Grade

Product	Size	Cat.#
Asp-N, Sequencing Grade	2 µg	V1621
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Asp-N, Sequencing Grade, is an endoproteinase that hydrolyzes peptide bonds on the N-terminal side of aspartic and cysteic acid residues: Asp and Cys. Asp-N activity is optimal in the pH range of 4.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in solution or in gel.

Storage Conditions: Store at 4°C.

Glu-C, Sequencing Grade

Product	Size	Cat.#
Glu-C, Sequencing Grade	50 µg	V1651
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Glu-C, Sequencing Grade (*S. aureus* V8), is a serine protease that specifically cleaves at the C-terminus of either aspartic or glutamic acid residues. In ammonium bicarbonate and ammonium acetate the enzyme specificity is higher at the glutamic residues. In phosphate buffers cleavage occurs at the aspartic and glutamic residues. Glu-C activity is optimal in the pH range of 4.0–9.0. This sequencing grade enzyme can be used alone or in combination with other proteases to produce protein digests for peptide mapping applications or protein identification by peptide mass fingerprinting or MS/MS spectral matching. It is suitable for digestion reactions in solution but not recommended for in-gel digestions.

Storage Conditions: Store at 2–10°C.

Elastase

Product	Size	Cat.#
Elastase	5 mg	V1891
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Elastase is a serine protease that preferentially cleaves at the C-terminus of alanine, valine, serine, glycine, leucine or isoleucine. Elastase has a unique capability of digesting elastin. This enzyme can be used alone or in combination with other proteases for protein analysis by mass spectrometry and other applications. Elastase activity is optimal at pH 9.0.

Storage Conditions: Store at 2–10°C.

Pepsin

Product	Size	Cat.#
Pepsin	250 mg	V1959
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Pepsin preferentially cleaves at the C-terminus of phenylalanine, leucine, tyrosine and tryptophan. This protease can be used alone or in combination with other proteases for protein analysis by mass spectrometry and other applications. Pepsin activity is optimal at pH 1.0–3.0.

Storage Conditions: Store at 2–10°C.

Thermolysin

Product	Size	Cat.#
Thermolysin	25 mg	V4001
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Thermolysin is a thermostable metalloproteinase. The high digestion temperatures may be used as an alternative to denaturants to improve digestion of proteolytically resistant proteins. Thermolysin preferentially cleaves at the N-terminus of the hydrophobic residues leucine, phenylalanine, valine, isoleucine, alanine and methionine. The optimal digestion temperature range is 65–85°C. Thermolysin activity is optimal at pH 5.0–8.5.

Storage Conditions: Store at –30 to –10°C.

Available in the Helix® on-site stocking system

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Proteinase K (Lyophilized)

Product	Size	Cat.#
Proteinase K	100 mg	V3021
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Proteinase K, produced by the fungus *Tritirachium album* Limber, is a serine protease that exhibits broad cleavage activity. It cleaves peptide bonds adjacent to the carboxylic group of aliphatic and aromatic amino acids and is useful for general digestion of protein in biological samples. It has been purified to remove RNase and DNase activities. The stability of Proteinase K in urea and SDS and its ability to digest native proteins make it useful for a variety of applications including preparation of chromosomal DNA for pulsed-field gel electrophoresis, protein fingerprinting and removal of nucleases from preparations of DNA and RNA. A typical working concentration for Proteinase K is 50–100µg/ml.

Form: Lyophilized powder.

Recommended Reaction Buffer: 50mM Tris-HCl (pH 8.0), 10mM $CaCl_2$.

Features:

- **Stable:** Active over a pH range of 4.3–12.0, in 0.5% SDS or 1% Triton® X-100 and retains >80% of its activity at temperatures up to 60°C.

Storage Conditions: Store lyophilized powder desiccated at –20°C.

Factor Xa Protease

Product	Size	Cat.#
Factor Xa Protease	50 µg	V5581
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Factor Xa Protease is purified from bovine plasma and activated by treatment with the activating enzyme from Russell's viper venom. Factor Xa Protease preferentially cleaves after the arginine residue in the amino acid sequence Ile-Glu-Gly-Arg.

Recommended Reaction Buffer: 20mM Tris-HCl (pH 7.4), 0.1M NaCl.

Storage Conditions: Store in aliquots at –20°C.

Protein Labeling and Detection

HaloTag® Fluorescent Ligands

Product	Size	Conc.	Cat.#
HaloTag® Cloning Starter System	1 each		G6050
HaloTag® TMR Ligand	30 µl	5 mM	G8251
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg		G3780
HaloTag® TMR Ligand	15 µl	5 mM	G8252
HaloTag® Oregon Green® Ligand	30 µl	1 mM	G2801
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg		G1321
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg		G1551
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg		G1571
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg		G1591
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg		G1601
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg		G1611
pFC20A HaloTag® T7 SP6 Flexi® Vector	20 µg		G1681
pFC20K HaloTag® T7 SP6 Flexi® Vector	20 µg		G1691
pFN19K HaloTag® T7 SP6 Flexi® Vector	20 µg		G1841
pFN19A HaloTag® T7 SP6 Flexi® Vector	20 µg		G1891
pFN18K HaloTag® T7 Flexi® Vector	20 µg		G2681
pFN18A HaloTag® T7 Flexi® Vector	20 µg		G2751
HaloTag® Oregon Green® Ligand	15 µl	1 mM	G2802
pFN21A HaloTag® CMV Flexi® Vector	20 µg		G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg		G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg		G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg		G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg		G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg		G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg		G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg		G2981
pFC14A HaloTag® CMV Flexi® Vector	20 µg		G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg		G9661
HaloTag® diAcFAM Ligand	30 µl	1 mM	G8272
	15 µl	1 mM	G8273
HaloTag® Coumarin Ligand	30 µl	10 mM	G8581
	15 µl	10 mM	G8582
HaloTag® Alexa Fluor® 488 Ligand	30 µl	1 mM	G1001
	15 µl	1 mM	G1002
HaloTag® Alexa Fluor® 660 Ligand	30 µl	3.5 mM	G8471
	15 µl	3.5 mM	G8472
HaloTag® TMRDirect™ Ligand	30 µl	0.1 mM	G2991
HaloTag® R110Direct™ Ligand	30 µl	0.1 mM	G3221
HaloTag® Biotin Ligand	30 µl	5 mM	G8281
	15 µl	5 mM	G8282
HaloTag® PEG-Biotin Ligand	30 µl	5 mM	G8591
	15 µl	5 mM	G8592
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The HaloTag® Fluorescent Ligands can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Fluorescent Ligands allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

HaloTag® Fluorescent Ligands for Cellular Imaging

Cell-permeant fluorescent ligands (rapid labeling protocol):

- HaloTag® TMR Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® Oregon Green® Ligand ($496_{Ex}/516_{Em}$)
- HaloTag® diAcFAM Ligand ($494_{Ex}/526_{Em}$)
- HaloTag® Coumarin Ligand ($353_{Ex}/434_{Em}$)

Cell-impermeant fluorescent ligands for cell-surface labeling (rapid labeling protocol):

- HaloTag® Alexa Fluor® 488 Ligand ($494_{Ex}/517_{Em}$)
- HaloTag® Alexa Fluor® 660 Ligand ($663_{Ex}/690_{Em}$)

Cell-permeant fluorescent ligands ("no wash" protocol):

- HaloTag® TMRDirect™ Ligand ($555_{Ex}/585_{Em}$)
- HaloTag® R110Direct™ Ligand ($502_{Ex}/527_{Em}$)

The Alexa Fluor® 488 Ligand is impermeable to cell membranes and, therefore, used to label cell surface proteins. The TMR Ligand, Oregon Green® Ligand, diAcFAM Ligand and Coumarin Ligand readily cross the cell membrane and, therefore, can be used to label intracellular proteins.

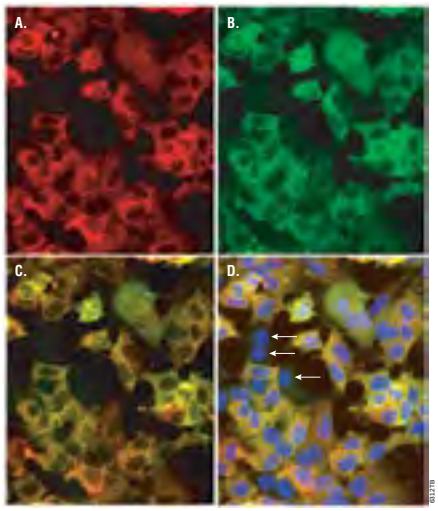
HaloTag® Ligands for Protein Detection

The HaloTag® Biotin Ligand consists of a 12-atom linker arm to biotin and is used as an affinity tag to capture the HaloTag® protein-based fusion construct using the strong biotin-streptavidin interaction.

The HaloTag® PEG-Biotin Ligand contains a spacer not found in the HaloTag® Biotin Ligand. This provides a significantly longer and more flexible linker between streptavidin and the HaloTag® protein, which may be advantageous in preserving the activity of a HaloTag® fusion partner protein upon immobilization or derivatization.

Features:

- **Label in Solution or on a Solid Support:** The HaloTag® Ligands bind to the HaloTag® protein or protein fusions with high specificity and affinity.
- **Label Your HaloTag® Protein in Live Cells:** The HaloTag® TMR, diAcFAM, Coumarin and Biotin Ligands readily cross the cell membrane.
- **Pull Down Protein Complexes:** The spacer and reactive linker of the HaloTag® PEG-Biotin Ligand provide ideal pull-down capabilities. Alternatively, pull down directly with the HaloLink™ Resin.
- **Image Fixed Cells:** The covalent bond is stable, allowing imaging of fixed cells and analysis of the labeled protein under stringent conditions.
- **Introduce Novel Functionalities or Perform Sequential Labeling:** The open architecture of the technology enables the use of different ligands for multiple applications.
- **Design Only One Genetic Construct for Multiple Experiments:** Obtain new functionality by using a different HaloTag® Ligand without having to design and clone a new expression construct.



Colabeling of HaloTag®-p65 fusion protein with HaloTag® TMR Ligand and the Anti-HaloTag® pAb. Panel A. Cytoplasmic (red) labeling of HEK293-p65-HT2 cells by HaloTag® TMR Ligand. **Panel B.** Cytoplasmic (green) labeling by Anti-HaloTag® pAb and Alexa Fluor® 488-conjugated anti-rabbit IgG (Invitrogen). **Panel C.** Colocalization of ligand and antibody binding activities. **Panel D.** Merger of red and green fluorescence with counterstaining of the nucleus by DAPI (blue). Arrows denote rare cells that show little or no expression of HaloTag®-p65. Protocols developed and performed at Promega.

HaloTag® Ligand Building Blocks

Product	Size	Cat.#
HaloTag® Amine (04) Ligand	5 mg	P6741
HaloTag® Amine (02) Ligand	5 mg	P6711
HaloTag® Iodoacetamide (04) Ligand	5 mg	P6771
HaloTag® Iodoacetamide (02) Ligand	5 mg	P1681
HaloTag® Succinimidyl Ester (04) Ligand	5 mg	P6751
HaloTag® Succinimidyl Ester (02) Ligand	5 mg	P1691
HaloTag® Thiol (04) Ligand	5 mg	P6761
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The HaloTag® Ligand Building Blocks can carry a variety of functionalities, including fluorescent labels, affinity tags and attachments to a solid phase. The covalent bond forms rapidly under general physiological conditions, is highly specific and essentially irreversible. The HaloTag® Ligand Building Blocks allow researchers to apply the chloroalkane group that HaloTag® protein reacts with to any compound or surface with a compatible chemical group, creating endless possible applications.

The HaloTag® Succinimidyl Ester (04) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkyl chloride separated by three ethylene glycol repeats (04). The HaloTag® Succinimidyl Ester (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Succinimidyl Ester (O2) Ligand contains a reactive succinimidyl ester (SE) group connected to an alkylchloride separated by an ethylene glycol repeat (O2). The HaloTag® Succinimidyl Ester (O2) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an amine, forming stable amide bond linkages. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

Available in the Helix® on-site stocking system
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The HaloTag® Amine (04) Ligand contains a reactive amine group connected to an alkyl chloride, separated by an ethylene glycol repeat (04). The HaloTag® Amine (04) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides, and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Amine (O2) Ligand contains a reactive amine group connected to an alkylchloride, separated by an ethylene glycol repeat (O2). The HaloTag® Amine (O2) Ligand can be successfully conjugated to any reporter group, protein, or nucleic acid derivative containing an activated carboxylic acid, sulfonyl halide, or isocyanate. Examples of activated carboxylic acids are succinimidyl esters, STP esters, acid halides, and TFP esters. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Iodoacetamide (04) Ligand contains a reactive iodoacetamide group connected an alkyl chloride separated by an ethylene glycol repeat (04). The HaloTag® Iodoacetamide (04) Ligand has been designed to rapidly react with sulfhydryl-containing molecules, whether small organic compounds, peptides or proteins. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Iodoacetamide (O2) Ligand contains a reactive iodoacetamide group connected to an alkylchloride separated by an ethylene glycol repeat (O2). HaloTag® Iodoacetamide (O2) Ligand has been designed to rapidly react with sulfhydryl-containing molecules, whether small organic compounds, peptides or proteins. The ligand with functional group can then be used with the HaloTag® protein for any application of interest.

The HaloTag® Thiol (04) Ligand contains a reactive sulfhydryl group connected to an alkyl chloride separated by three ethylene glycol repeats (04). The HaloTag® Thiol (04) Ligand can be successfully conjugated to any reporter group, cross-linking reagent (bound or free), or nucleic acid derivative containing a number of different alkylating groups, forming stable thioether bonds. Commonly used reagents that rapidly react with sulfhydryls include iodo- or bromo-acetyls or benzyls, bromo- or chloro-mustards, maleimides, aziridines, acryloyl derivatives, and halide or sulfonate containing arenes (those bearing Electron Withdrawing Groups (EWGs) react most rapidly). The reactive ligand can be captured with HaloTag® protein either before or after the thiol group is functionalized for any application of interest.

Storage Conditions: Store Cat.# P1691 and P6751 at or below –70°C under inert atmosphere. Store Cat.# P6711 and P6741 at or below –20°C in an air-tight container in the absence of light. Store Cat.# P1681, P6771 and P6761 at or below –20°C under inert atmosphere in the absence of light. See Promega Product Information for additional details on individual products.

HaloTag® Fusion (C-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTC HaloTag® CMV-neo Vector	20 µg	G7711
pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	G8421
pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	G8431
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321
Available Separately	**Size**	**Cat.#**
HaloTag® Cloning Starter System	1 each	G6050
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are designed for expression of C-terminal-tagged HaloTag® fusion proteins in mammalian cells. Once expressed, the HaloTag® fusion protein may be used for cell imaging of protein localization or trafficking in conjunction with the fluorescent HaloTag® Ligands. In addition, the HaloTag® fusion protein can be purified or pulled down as a complex with its protein partners. We offer two types of HaloTag® fusion vectors to accommodate your cloning preferences:

- **pHT Vector Series:** Simple Multiple Cloning Site (MCS) plasmids for traditional cloning.
- **pF Vector Series**: Flexi® Vector Cloning System—a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Find your gene, precloned, and experimentally validated.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows for direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

HaloTag® Fusion (N-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTN HaloTag® CMV-neo Vector	20 µg	G7721
pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	G8441
pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	G8451
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981
Available Separately	**Size**	**Cat.#**
HaloTag® Cloning Starter System	1 each	G6050
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are designed for expression of N-terminal-tagged HaloTag® fusion proteins in mammalian cells. Once expressed, the HaloTag® fusion protein may be used for cell imaging of protein localization or trafficking in conjunction with the fluorescent HaloTag® Ligands. In addition, the HaloTag® fusion protein can be purified or pulled down as a complex with its protein partners. We offer two types of HaloTag® fusion vectors to accommodate your cloning preferences:

- **pHT Vector Series:** Simple Multiple Cloning Site (MCS) plasmids for traditional cloning.
- **pF Vector Series**: Flexi® Vector Cloning System---a directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Find your gene, precloned, and experimentally validated.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows for direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

Relative Mammalian Protein Expression Levels for HaloTag® Flexi® Vectors.

Vector Name	Cat.#	Expression Level*
pFC14A HaloTag® CMV Flexi® Vector	G9651	High
pFC14K HaloTag® CMV Flexi® Vector	G9661	High
pFC15A HaloTag® CMV*d1* Flexi® Vector	G1611	Medium
pFC15K HaloTag® CMV*d1* Flexi® Vector	G1601	Medium
pFC16A HaloTag® CMV*d2* Flexi® Vector	G1591	Low
pFC16K HaloTag® CMV*d2* Flexi® Vector	G1571	Low
pFC17A HaloTag® CMV*d3* Flexi® Vector	G1551	Ultra-Low
pFC17K HaloTag® CMV*d3* Flexi® Vector	G1321	Ultra-Low
pFN21A HaloTag® CMV Flexi® Vector	G2821	High
pFN21K HaloTag® CMV Flexi® Vector	G2831	High
pFN22A HaloTag® CMVd1 Flexi® Vector	G2841	Medium
pFN22K HaloTag® CMVd1 Flexi® Vector	G2851	Medium
pFN23A HaloTag® CMV*d2* Flexi® Vector	G2861	Low
pFN23K HaloTag® CMV*d2* Flexi® Vector	G2871	Low
pFN24A HaloTag® CMV*d3* Flexi® Vector	G2881	Ultra-Low
pFN24K HaloTag® CMV*d3* Flexi® Vector	G2981	Ultra-Low
pFC27A HaloTag® CMV-neo Flexi® Vector	G8421	High[1]
pFC27K HaloTag® CMV-neo Flexi® Vector	G8431	High[2]
pFN28A HaloTag® CMV-neo Flexi® Vector	G8441	High[1]
pFN27K HaloTag® CMV-neo Flexi® Vector	G8451	High[2]

9161LB

[1]This vector confers ampicillin resistance for Flexi® cloning, and the neomycin (G418) selection cassette affords antibiotic selection of stable cell lines expressing the HaloTag® fusion protein.

[2]This vector confers kanamycin resistance for Flexi® cloning, and the neomycin (G418) selection cassette affords antibiotic selection of stable cell lines expressing the HaloTag® fusion protein.

*Expression level depends on the cell type and the protein fused to HaloTag® protein.

Available in the Helix® on-site stocking system

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HaloTag® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pH6HTN His_6HaloTag® T7 Vector	20 µg	G7971
pH6HTC His_6HaloTag® T7 Vector	20 µg	G8031
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN19A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1891
pFN19K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1841
pFC20A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1681
pFC20K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1691
pFN29A His_6HaloTag® T7 Flexi® Vector	20 µg	G8261
pFN29K His_6HaloTag® T7 Flexi® Vector	20 µg	G8331
pFC30A His_6HaloTag® T7 Flexi® Vector	20 µg	G8321
pFC30K His_6HaloTag® T7 Flexi® Vector	20 µg	G8381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: These vectors are used for inducible expression of HaloTag® fusion proteins in *E. coli* and cell-free systems using the T7 RNA polymerase promoter. Expression levels depend highly on the nature of the protein, but in general the N-terminal HaloTag® fusion protein (e.g., pFN18A/K) can increase expression level, enhance refolding and boost solubility of the expressed protein. HaloTag® vectors are supplied in two formats: as multiple cloning site (MCS) vectors for traditional cloning and as Flexi® System vectors.

The Flexi® Vector System is a simple, directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence. Direct transfers can only occur between two N-terminal tagged vectors or from an N-terminal to a C-terminal vector. The MCS vectors and several Flexi® system vectors contain a His_6-HaloTag® dual tag. The dual tag enables protein purification with the reusable Ni-resin while retaining the HaloTag® covalent labeling properties.

Multiple Cloning Site (MCS) Vectors

pH6HTN His_6HaloTag® T7 Vector (Cat.# G7971) is designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

pH6HTC His_6HaloTag® T7 Vector (Cat.# G8031) is designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* and T7 cell-free expression systems.

Flexi® System Vectors

pF1A/K T7 Flexi® Vectors (Cat.# C8441, C8451) are designed for untagged protein expression.

pFN18A/K HaloTag® T7 Flexi® Vectors (Cat.# G2751, G2681) are designed for protein expression with an N-terminal HaloTag® in *E. coli* and T7 cell-free expression systems.

pFN19A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1891, G1841) are designed for protein expression with an N-terminal HaloTag® in T7 and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFC20A/K HaloTag® T7 SP6 Flexi® Vectors (Cat.# G1681, G1691) are designed for protein expression with a C-terminal HaloTag® in *E. coli* and SP6 cell-free expression systems. These vectors are optimized for cell-free expression systems.

pFN29A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8261, G8331) are designed for protein expression with an N-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

pFC30A/K His_6HaloTag® T7 Flexi® Vectors (Cat.# G8321, G8381) are designed for protein expression with a C-terminal His_6-HaloTag® dual tag in *E. coli* T7 cell-free expression systems.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Choice of Systems:** Choose between traditional (MCS) and Flexi® cloning to get the benefits of HaloTag® technology.
- **Dual Tag:** Couple the protein solubility and labeling benefits of HaloTag® technology with the reusability and the throughput of Ni-affinity technology.
- **Versatile Cloning:** Choose from a variety of expression systems and fusion tag orientations and then transfer to others as required (for Flexi® system).
- **Time Savings:** Barnase insert (Flexi® system) decreases the number of background colonies, allowing efficient transfer of genetic constructs.

Storage Conditions: Store vectors at –20°C.

FluoroTect™ $Green_{Lys}$ in vitro Translation Labeling System

Product	Size	Cat.#
FluoroTect™ $Green_{Lys}$ in vitro Translation Labeling System	40 reactions	L5001

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The FluoroTect™ $Green_{Lys}$ in vitro Translation Labeling System allows for the fluorescent labeling and detection of proteins synthesized in vitro. The system is based on a lysine-charged tRNA that is labeled at the ε position of the lysine with the fluorophore BODIPY®-FL. Fluorescent lysine residues will be incorporated into synthesized proteins during in vitro translation reactions, eliminating the need for radioactivity.

Detection of the labeled proteins is accomplished in 2–5 minutes directly "in-gel" using a laser-based fluorescent gel scanner. This eliminates any requirements for protein gel manipulation such as fixing/drying or any safety, regulatory and waste disposal issues associated with the use of radioactively labeled amino acids use. The convenience of "in-gel" detection also avoids the time-consuming electroblotting and detection steps of conventional non-isotopic systems.

Features:

- **Fast:** Data can be obtained in minutes, eliminating overnight exposures associated with radioactive-based systems or time-consuming steps utilized by traditional non-isotopic methodologies.
- **Convenient:** Results based on "in-gel" detection. No requirement to transfer, fix, or dry gels.
- **Non-Radioactive:** No safety, regulatory or waste disposal issues associated with radioactivity.
- **Flexible:** The modified charged tRNA can be used with a variety of Promega translation systems including: Rabbit Reticulocyte Lysate, TNT® Coupled Transcription/Translation System, Wheat Germ Extract and *E. coli* S30 Extract.

Storage Conditions: Store at –70°C.

Transcend™ Non-Radioactive Translation Detection Systems

Product	Size	Cat.#
Transcend™ Colorimetric Translation Detection System	30 reactions	L5070
Transcend™ Chemiluminescent Translation Detection System	30 reactions	L5080
Available Separately	**Size**	**Cat.#**
Transcend™ tRNA	30 µl	L5061

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Transcend™ Non-Radioactive Translation Detection Systems allow non-radioactive detection of proteins synthesized in vitro. Using these systems, biotinylated lysine residues are incorporated into nascent proteins during translation, eliminating the need for labeling with [^{35}S]methionine or other radioactive amino acids. This biotinylated lysine is added to the translation reaction as a precharged ε-labeled biotinylated lysine-tRNA complex (Transcend™ tRNA) rather than a free amino acid. After SDS-PAGE and electroblotting, the biotinylated proteins can be visualized by binding either Streptavidin-Alkaline Phosphatase (Streptavidin-AP) or Streptavidin-Horseradish Peroxidase (Streptavidin-HRP), followed either by colorimetric or chemiluminescent detection. Typically, these methods can detect 0.5–5ng of protein within 3–4 hours after gel electrophoresis. This sensitivity is equivalent to that achieved with [^{35}S]methionine incorporation and autoradiographic detection 6–12 hours after gel electrophoresis.

Features:

- **Sensitive:** The biotin tag allows detection of 0.5–5ng of translated protein.
- **Safe:** No radioisotope handling, storage or disposal is required.
- **Fast:** Labeled proteins can be detected 3–4 hours after gel electrophoresis.
- **Flexible:** Results can be visualized by using colorimetric or chemiluminescent detection.

Storage Conditions: Store Transcend™ tRNA at –70°C. Do not subject the Transcend™ tRNA to more than five freeze-thaw cycles. Store all other components at 4°C.

ECL Western Blotting Substrate

Product	Size	Cat.#
ECL Western Blotting Substrate	250 ml	W1001
	500 ml	W1015

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ECL Western Blotting Substrate is a highly sensitive non-radioactive, enhanced luminol-based chemiluminescent substrate for the detection of horseradish peroxidase (HRP) conjugates on immunoblots. The ECL Western Blotting Substrate detects and visualizes the presence of picogram (pg) amounts of antigen through the use of photographic or other suitable chemiluminescent imaging methods.

Features:

- **High Sensitivity:** Detect picogram levels of protein with minimal background.
- **Save Time:** No optimization required; you can switch from other entry-level ECL substrates.

Storage Conditions: Store at 2–8°C.

TMB One Solution

Product	Size	Cat.#
TMB One Solution	100 ml	G7431

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 231.

AttoPhos® AP Fluorescent Substrate System

Product	Size	Cat.#
AttoPhos® AP Fluorescent Substrate System	3 × 36 mg	S1000
AttoPhos® AP Fluorescent Substrate System Trial Size	1 × 36 mg	S1001
Available Separately	**Size**	**Cat.#**
AttoPhos® Substrate	36 mg	S1011
	100 mg	S1012
	1 g	S1013
AttoPhos® Buffer	60 ml	S1021
	240 ml	S1022

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: AttoPhos® AP Fluorescent Substrate System contains a highly sensitive fluorescent alkaline phosphatase (AP) substrate.

Features:

- **Sensitivity:** Low fluorescence signal until enzymatically acted upon, yielding detection of AP to 0.1 attomole.
- **Low Background:** Low fluorescence from interfering biological molecules.
- **Linearity:** Linear kinetics over five orders of magnitude of AP concentration.
- **Additional Features:** Excitation at 435nm, emission at 555nm and large Stokes' shift (≈120nm).

Storage Conditions: Store at 4°C.

Blocking Agents

Product	Size	Conc.	Cat.#
Blot-Qualified BSA	10 g		W3841
Tween® 20	2.5 ml	100 %	W3831

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: This BSA (bovine serum albumin) has been tested and qualified for optimum performance in immunoblotting applications with alkaline phosphatase antibody conjugates. It is shown to be alkaline phosphatase-free.

Tween® 20 is a nonionic detergent used as a buffer component for immunoscreening in the ProtoBlot® Systems. In addition to blocking agents such as BSA, which saturate excess sites of antibody binding on membranes, this detergent acts in solution to dissociate nonspecific interactions with an antibody probe.

Available in the Helix® on-site stocking system

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ProtoBlot® II AP Systems with Stabilized Substrate and *Western Express*® Fast Blotting Protocol

Product	Size	Cat.#
ProtoBlot® II AP System with Stabilized Substrate, Human	1 each	W3940
ProtoBlot® II AP System with Stabilized Substrate, Mouse	1 each	W3950
ProtoBlot® II AP System with Stabilized Substrate, Rabbit	1 each	W3960
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The ProtoBlot® II AP Systems with Stabilized Substrate are designed for the rapid and sensitive detection of proteins or other macromolecular antigens immobilized on nitrocellulose or PVDF membranes. Proteins can be transferred from gels after electrophoresis (Western blots) or bound directly from solution ("dot" blots). The *Western Express*® Fast Blotting Protocol is included with the system and can reduce dramatically the time required to perform immunodetection. All ProtoBlot® II AP Systems contain BSA as a stabilizer and 0.05% sodium azide as a preservative.

Features:

- **Fast:** Easy-to-use *Western Express*® Protocol allows the detection of dot blots in 30–45 minutes and the detection of Western blots in 1–2 hours.
- **Convenient:** The system contains Western Blue® Stabilized Substrate for AP, which is a ready-to-use solution of BCIP/NBT. No reagent preparation is required for the substrate.

For many applications, AP conjugates are superior to HRP conjugates because they:

- offer greater sensitivity (tenfold) of detection.
- are not inhibited by azide.
- use a substrate that is not prone to fading during long-term storage.
- have protocols provided for both PVDF and nitrocellulose membranes.

Storage Conditions: Store antibody conjugates at 4°C (undiluted). Store Western Blue® Substrate at room temperature.

Western Blue® Stabilized Substrate for Alkaline Phosphatase

Product	Size	Cat.#
Western Blue® Stabilized Substrate for Alkaline Phosphatase	100 ml	S3841
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 23.

TMB Stabilized Substrate for Horseradish Peroxidase

Product	Size	Cat.#
TMB Stabilized Substrate for Horseradish Peroxidase	200 ml	W4121
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 21.

BCIP/NBT Color Development Substrate (5-bromo-4-chloro-3-indolyl-phosphate/nitro blue tetrazolium)

Product	Size	Cat.#
BCIP/NBT Color Development Substrate	1.25/2.5 ml	S3771
For Laboratory Use.		

For additional information see page 14.

Protein Deamidation Detection

ISOQUANT® Isoaspartate Detection Kit

Product	Size	Cat.#
ISOQUANT® Isoaspartate Detection Kit	100 assays	MA1010
Not For Medical Diagnostic Use.		

Description: The ISOQUANT® Isoaspartate Detection Kit is intended for quantitative detection of isoaspartic acid residues in proteins and peptides, which can result from the gradual, nonenzymatic deamidation of asparagine or rearrangement of aspartic acid residues during storage or handling. Because the kit does not depend on the monitoring of charge differences for detection, charge heterogeneity does not interfere with the assay. The ISOQUANT® Kit can be used on peptides or proteins such as monoclonal antibodies.

Features:

- **Great Efficiency:** Simple procedure with a test time of less than one hour. Automation possible with HPLC autosampler capability.
- **Economical:** HPLC detection eliminates cost and inconvenience of radioactive materials handling.
- **Analytical:** Quantitative results available.
- **Versatile:** Perform individual samples or batches. Small sample size makes the assay suitable for research, analytical methods, formulations and process development work.
- **Robust:** Not affected by common buffer components.
- **HPLC Detection Method:** Fits with existing equipment and expertise.
- **Sensitive:** Detects isoaspartate resulting from aspartic acid rearrangement as well as deamidation of asparagine.

Storage Conditions: Store at –20°C.

17 Protein Purification and Interactions

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

HaloTag® Protein Purification

HaloTag® Protein Purification System

Product	Size	Cat.#
HaloTag® Protein Purification System	1 each	G6280
HaloTag® Protein Purification System Sample Pack	1 each	G6270
Available Separately	**Size**	**Cat.#**
Single Step (KRX) Competent Cells	20 × 50 µl	L3002
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Protein Purification System is designed to purify proteins fused to the HaloTag® novel protein tag that enhances the expression and solubility of recombinant proteins. HaloTag® Technology enables the covalent, efficient and specific capture of a protein of interest onto HaloLink™ Resin, thus overcoming the equilibrium-based limitations associated with affinity tags (i.e., poor capture of proteins expressed at low levels and protein loss during washing of the purification resin.

The HaloTag® technology offers a quick and convenient way to test protein expression of HaloTag® fusion proteins as well as monitor the efficiency of immobilization to HaloLink™ Resin by labeling with fluorescent HaloTag® TMR Ligand followed by SDS-PAGE analysis. Guidelines can be found in the *HaloLink™ Resin Technical Manual* #TM250, the *HaloLink™ Protein Array Technical Manual* #TM310 and the *HaloCHIP™ System Technical Manual* #TM075.

Outline of Procedure

The HaloTag® protein, a 34kDa mutated hydrolase, covalently attaches to HaloLink™ Resin via an immobilized chloroalkane ligand. TEV Protease cleaves the target protein from the HaloLink™ Resin. The TEV Protease, which has an N-terminal (HQ) tag, is removed from the protein of interest using HisLink™ Resin, and the purified protein of interest is recovered. The appropriate vector that encodes the HaloTag® protein and expresses protein optimally in *E. coli* is pFN18A HaloTag® T7 Flexi® Vector (G2751) or pFN18K HaloTag® T7 Flexi® Vector (G2681). These vectors can be purchased separately.

Features:

- **Experience Superior Yield, Purity and Specific Activity of Soluble, Functional Proteins Compared to His-Tag, GST and MBP Affinity Tags:** Specific and covalent HaloTag® fusion protein capture and immobilization on HaloLink™ Resin.
- **Achieve Enhanced Target Protein Expression in Prokaryotic, Mammalian and Cell-Free Systems:** Proteins are expressed as HaloTag® fusion proteins.
- **Purify Poorly Expressed Fusion Proteins:** Rapid, specific and covalent capture of HaloTag® protein onto HaloLink™ Resin is a nonequilibrium process.
- **Efficiently Recover Tag-Free Target Protein using TEV Protease Cleavage:** Optimized TEV protease recognition site within the interconnecting polypeptide separating the HaloTag® protein and the fusion partner. HaloTag® protein remains immobilized on the resin due to covalent capture.
- **Save Time:** One buffer compatible with downstream applications for all purification steps.
- **Perform Easy In-Gel Detection and Quantification of Protein Expression Levels with Fluorescent HaloTag® Ligands:** Highly stable HaloTag® protein-ligand interaction permits boiling with SDS sample buffer followed by resolving on SDS-PAGE.

Storage Conditions: Store the HaloLink™ Resin and HisLink™ Resin at 4°C. Do not freeze the resins. Store the TEV Protease at –20°C.

HaloTag® Mammalian Protein Purification System

Product	Size	Cat.#
HaloTag® Mammalian Protein Detection and Purification System	1 each	G6795
HaloTag® Mammalian Protein Purification System	1 each	G6790
HaloTag® Mammalian Protein Detection and Purification System Sample Pack	1 each	G6799

Available Separately	Size	Conc.	Cat.#
HaloTEV Protease	1,000 u	5 u/µl	G6601
	4,000 u	5 u/µl	G6602
HaloTag® TMRDirect™ Ligand	30 µl	0.1 mM	G2991
Protease Inhibitor Cocktail, 50X	1 ml		G6521

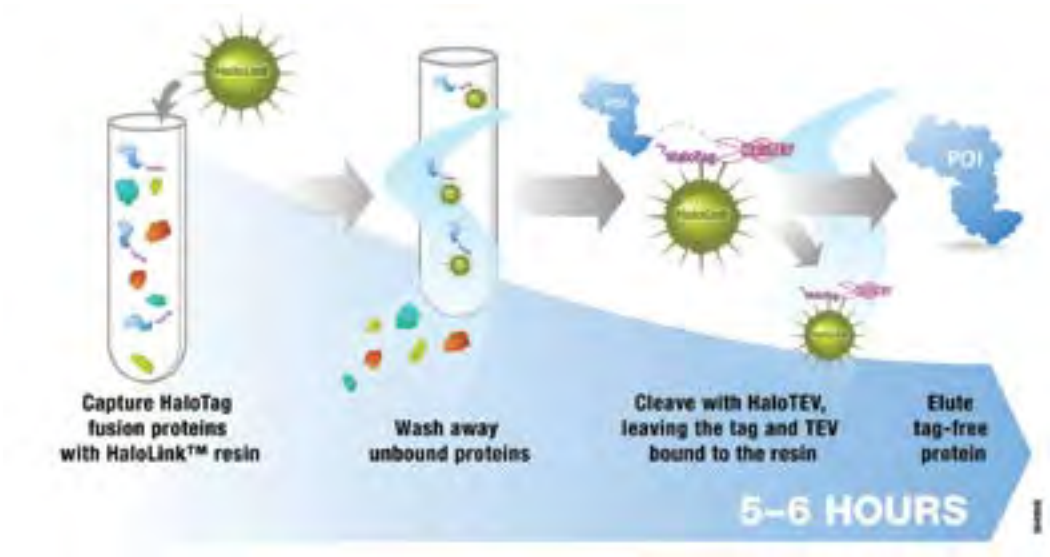
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Mammalian Protein Purification System (Cat.# G6790) is an optimized kit for purification of HaloTag® fusion proteins from mammalian cell culture lysates. HaloTag® fusion proteins form a highly specific and covalent bond with the HaloLink™ Resin. The covalent binding coupled with the low nonspecific binding of the HaloLink™ Resin provides superior purity and recovery of recombinant proteins from cultured mammalian cells, even at low expression levels. The HaloTag® Mammalian Protein Detection and Purification System (Cat.# G6795) also includes HaloTag® TMRDirect™ Ligand. The simple-to-use fluorescent detection of the HaloTag® fusion facilitates rapid optimization of expression and purification conditions.

Features:

- **Purify More Protein:** HaloLink™ Resin covalently binds >7mg/ml of HaloTag® fusion protein (10X more capacity compared to FLAG®). Recovery is highly efficient, commonly >75%.
- **Higher Purity:** Covalent capture allows extensive and/or stringent washes without loss of bound protein, resulting in very low (<0.1%) nonspecific binding and a highly pure protein.
- **Easily Scalable:** Scale up and down, important for obtaining mg-plus quantities.
- **Optimized for Mammalian Protein Expression:** The HaloTag® platform allows flexibility to move between purification, pull-downs and cellular imaging with a single construct.

Storage Conditions: Store the Spin Columns at room temperature. Store the HaloLink™ Resin at 4°C. Store the HaloTEV Protease, HaloTag® TMRDirect™ Ligand and powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.



Schematic of the HaloTag® Mammalian Protein Purification System protocol. Streamlined purification process leads to higher purity and recovery of recombinant proteins from cultured cells.

Available in the Helix® on-site stocking system

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HaloTag® Mammalian Pull-Down Systems

Product	Size	Cat.#
HaloTag® Complete Pull-Down System	1 each	G6509
HaloTag® Mammalian Pull-Down and Labeling System	24 reactions	G6500
HaloTag® Mammalian Pull-Down System	24 reactions	G6504
HaloTag® Control Vector	20 µg	G6591
Available Separately	**Size**	**Cat.#**
Protease Inhibitor Cocktail, 50X	1 ml	G6521
Mammalian Lysis Buffer	40 ml	G9381

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloTag® Mammalian Pull-Down Systems (Cat.# G6500, G6504 and G6509) are designed to capture and purify intracellular binary and higher order protein complexes, including transient or weakly interacting partners.

HaloTag® Mammalian Pull-Down System (Cat.# G6504) includes buffers and resin necessary to perform a HaloTag® pull-down.

HaloTag® Mammalian Pull-Down and Labeling System (Cat.# G6500) includes everything in G6504 *plus* the HaloTag® TMRDirect™ Ligand, which allows correlative cellular localization and real-time imaging studies.

HaloTag® Complete Pull-Down System (Cat.# G6509) includes everything in G6500 *plus* a starter cloning system, Wizard® SV Gel and PCR Clean-Up System, and FuGENE® HD Transfection Reagent.

The **HaloTag® Control Vector** provides protein expression of the HaloTag® protein in mammalian cells, *E. coli* or in vitro expression systems dependent on human cytomegalovirus (CMV) intermediate early enhancer, T7 or SP6 RNA polymerase promoters. It can be used as a control for any HaloTag® experimental system and can be used for both stable and transient HaloTag® expression in mammalian cells; for stable expression, co-transfection with a vector containing a selectable marker is required.

The **Protease Inhibitor Cocktail, 50X**, is a mixture of six different protease inhibitors with different target protease specificities. This product is provided in a freeze-dried format and can be reconstituted using either 100% ethanol or DMSO.

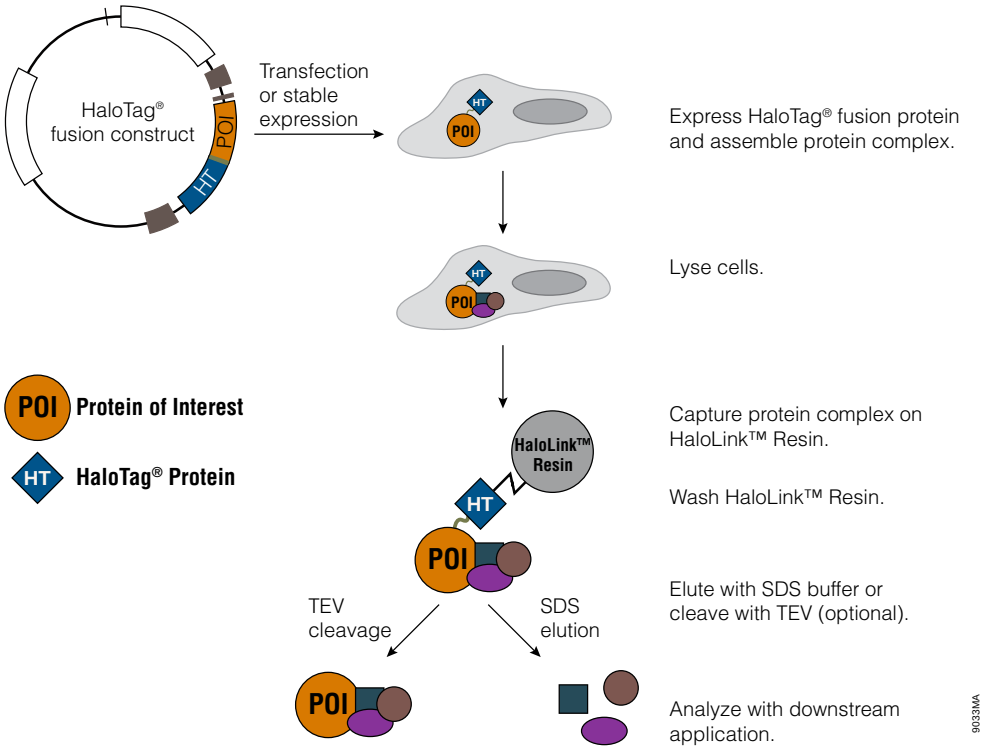
The **Mammalian Lysis Buffer** is designed for use with HaloTag® Mammalian-based expression systems such as the HaloTag® Mammalian Pull-Down and Labeling Systems as well as the HaloCHIP™ System (Cat.# G9410). Formulation consists of 50mM Tris-HCl, 150mM NaCl, 1% Triton® X-100 and 0.1% sodium deoxycholate (pH 7.5).

Related Services: Mass Spec Services.

Features:

- **Rapid, Efficient and Covalent Capture of Binary and Higher Order Complexes Directly from Lysates:** Improved capture of protein partners, including transient interactions.
- **High Purity and Low Background:** Improved accuracy in identification of proteins; covalent attachment allows bait protein to remain behind if desired.
- **Ability to Fluorescently Label the Same Genetic Fusion:** Correlate complex capture with cellular localization.
- **Compatibility with All Downstream Methods of Analysis:** Freedom to identify complexes in variety of applications including mass spectrometry.

Storage Conditions: Store the 10X TBS Buffer and SDS Elution Buffer at room temperature. Store the HaloLink™ Resin and Mammalian Lysis Buffer at 4°C. Store the HaloTag® TMRDirect™ Ligand and powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.



Representation of the HaloTag® mammalian pull-down assay using HaloTag® fusion protein as bait.

HaloTEV Protease

Product	Size	Conc.	Cat.#
HaloTEV Protease	1,000 u	5 u/µl	G6601
	4,000 u	5 u/µl	G6602

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: HaloTEV Protease (81kDa) is a fusion between the HaloTag® protein and TEV protease, a highly specific proteolytic enzyme that cleaves at a specific TEV site, a specific seven-amino-acid sequence (ENLYFQ(G/S)). HaloTEV Protease allows covalent immobilization on HaloLink™ Resin and removal from a cleavage reaction in a single-step purification. The covalent capture of HaloTEV Protease improves purity of the final target protein and assures the improved recovery of the TEV protease.

Features:

- **Improve Final Protein Purity:** Covalently remove HaloTEV from your purified protein with HaloLink™ Resin.
- **Optimized for HaloTag® Purifications:** Proteins can be purified tag-free in a single step as the HaloLink™ Resin will bind both HaloTag® protein tag and the HaloTEV protease.

Storage Conditions: Store at –20°C.

HaloLink™ Resin

Product	Size	Cat.#
HaloLink™ Resin	1.25 ml	G1912
	2.5 ml	G1913
	10 ml	G1914
	25 ml	G1915

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloLink™ Resin provides a method for covalent and oriented attachment of HaloTag® fusion proteins onto a solid surface. The resin consists of a HaloTag® ligand bound to Sepharose® beads that specifically and rapidly binds HaloTag® fusion proteins. HaloLink™ Resin has high binding capacity. Due to covalent linkage, HaloTag® fusion proteins cannot be eluted from the resin, allowing extensive washing to remove nonspecifically bound protein without the danger of eluting HaloTag® fusion proteins. The binding rate is very rapid and equivalent to biotin-streptavidin.

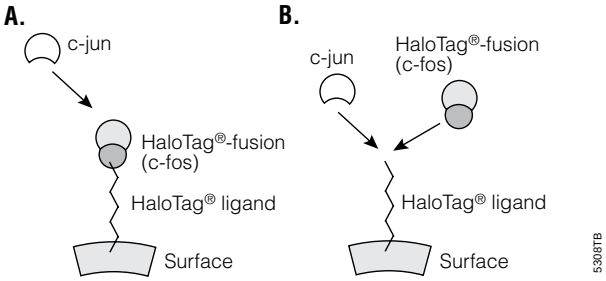
The HaloLink™ Resin can be used in a variety of applications including: detection and analysis of protein:protein interactions (in vivo and in vitro), detection of enzymatic activity of immobilized HaloTag® fusions and one-step purification of fusion protein in conjunction with proteolytic cleavage. A variety of vectors for the expression of HaloTag® fusion proteins in bacterial, mammalian or cell-free systems are available.

The HaloTag® technology offers a quick and convenient way to test protein expression of HaloTag® fusion proteins as well as monitor the efficiency of immobilization to HaloLink™ Resin by labeling with fluorescent HaloTag® TMR Ligand followed by SDS-PAGE analysis. Guidelines can be found in the *HaloLink™ Resin Technical Manual* #TM250.

Features:

- **Covalent Attachment:** Enables stringent washing, minimizing nonspecific background without dissociation of bound HaloTag® fusion proteins.
- **Fast Binding Kinetics:** Enhances the detection of protein:protein interactions and enables binding of proteins at low concentrations.
- **Oriented Immobilization:** Allows maximal enzyme activity of bound protein.
- **High Binding Capacity:** One milliliter of settled resin binds >7mg of HaloTag® fusion proteins.

Storage Conditions: Store at 4°C.



Detection of protein:protein interactions using the HaloLink™ Resin. **Panel A.** HaloTag® fusion protein (bait, HaloTag® c-fos) is expressed in TNT® T7 Quick Coupled Transcription/Translation System and immobilized to the HaloLink™ Resin. The partner (prey) c-jun is expressed in TNT® reactions and mixed with the immobilized HaloTag® c-fos and allowed to bind. **Panel B.** Both interacting partners, bait and prey HaloTag® fusions are expressed in individual TNT® reactions, mixed and allowed to bind; then the HaloLink™ Resin is added, and the complex is captured.

Available in the Helix® on-site stocking system

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HaloLink™ Protein Array System

Product	Size	Cat.#
HaloLink™ Array Six Slide System	6 slides	G6190
HaloTag® Standard Protein	30 µg	G4491
Protein G HaloTag® Fusion Protein	5 mg	G7291

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Protein arrays enable parallel analysis of multiple protein:protein, protein:drug or protein:nucleic acid interactions. The HaloLink™ Protein Array System provides a way to create homebrew (on-demand) protein arrays by combining innovative HaloTag® technology, surface engineering and cell-free protein expression systems.

The HaloTag® protein is a mutated hydrolase that forms a covalent bond with HaloTag® ligands. Under physiological conditions binding is rapid and highly specific, yielding a complex that is stable even under stringent conditions. Using the HaloLink™ Protein Array System, HaloTag® fusion proteins are expressed in a cell-free expression system and then covalently captured on hydrogel-coated glass slides derivatized with HaloTag® Ligands. The fusion proteins are captured directly from the expression reaction mixture without prior purification. Using this approach, multiple fusion proteins can be rapidly synthesized and immobilized in parallel on the slide surface, and an entire experiment including protein expression, custom array formation and protein interaction analysis can be completed in less than eight hours.

The HaloLink™ Array Six Slide System contains HaloLink™ Slides, HaloLink™ Array Gaskets and Anti-HaloTag® Antibody. To use the Six Slide System you will need to provide your own protein expression system or order the TNT® T7 Quick Coupled Transcription/Translation System (Cat.# L1170 or L1171) or TNT® SP6 High-Yield Wheat Germ Protein Expression System (Cat.# L3260 or L3261). The HaloTag® Standard Protein (Cat.# G4491) is not included with the Six Slide System but can be ordered separately.

The HaloTag® technology offers a quick and convenient way to test protein expression of HaloTag® fusion proteins by labeling with fluorescent HaloTag® TMR Ligand followed by SDS-PAGE analysis. Guidelines can be found in the *HaloLink™ Protein Array Technical Manual* #TM310.

The Protein G HaloTag® Fusion Protein (Cat.# G7291) is a protein consisting of recombinant Protein G from *Streptococci* without the albumin-binding domain and HaloTag® protein. The Protein G HaloTag® Fusion Protein, which has a molecular weight of 58kDa, can be covalently coupled to different chloroalkane surfaces, reactive and fluorescent HaloTag® ligands. This fusion protein enables an oriented attachment of antibodies to the HaloLink™ Protein Arrays.

Features:

- **Fast Protein Production:** Cell-free expression systems allow quick, single-tube, coupled transcription/translation for the production of the proteins of interest to be used in the protein array experiment.
- **Irreversible Binding of the Captured Protein:** Unlike other affinity tags, which tend to dissociate from the surface, HaloTag® fusion proteins are covalently bound to the HaloLink™ Slide.
- **No Protein Purification Step:** The protein of interest is immobilized directly from the cell-free expression reaction.
- **Reduced Nonspecific Binding:** HaloLink™ Slides have a unique hydrogel coating that is designed to prevent nonspecific binding while preserving the functionality of specifically captured proteins.
- **Extensive Washing Allowed:** Covalent binding of HaloTag® fusion proteins to the HaloLink™ Slide allows extensive, stringent washing that results in reduced background and a lower incidence of false positives.
- **No Need for a Robotic Arrayer:** The unique 50-well configuration allows multiple interactions to be studied in parallel without the need for a complex robotic arrayer.
- **Highly Efficient Antibody Binding:** Protein G HaloTag® Fusion Protein increases the binding of antibodies to surfaces as compared to direct capture method.

Storage Conditions: Store the HaloTag® Standard Protein, Anti-HaloTag® Antibody and Protein G HaloTag® Fusion Protein at –20°C. The HaloLink™ Protein Array Slides should be stored at –20°C and opened just before use. After opening, unused slides should be stored at –20°C and used within one month. Store the HaloLink™ Array Gaskets at room temperature.

Magne™ HaloTag® Beads

Product	Size	Cat.#
Magne™ HaloTag® Beads, 20% Slurry	1 ml	G7281
	5 ml	G7282

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Magne™ HaloTag® Beads provide a convenient method to covalently capture HaloTag® fusion proteins with magnetic particles for protein pull-downs and purification. These magnetic beads offer a high binding capacity (≥20mg/ml) for purified HaloTag® fusion proteins with low nonspecific protein binding. The magnetic handling properties allow streamlined protein purification and eliminate the need for multiple centrifugation steps, facilitating automated applications on robotic platforms.

The Magne™ HaloTag® Beads (Cat.# G7281 and G7282) are the recommended replacement for the discontinued HaloLink™ Magnetic Beads (Cat.# G9311).

Features:

- **Maximize Recovery of HaloTag® Fusion Proteins:** Binding capacity ≥20mg of purified HaloTag® fusion protein per milliliter of settled particles.
- **Experience Superior Magnetic Handling for High-Throughput Applications:** Magnetic particles encapsulated with macroporous cellulose.

Storage Conditions: Store at 2–10°C.

HaloCHIP™ System

Product	Size	Cat.#
HaloCHIP™ System	20 reactions	G9410
Available Separately	**Size**	**Cat.#**
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780

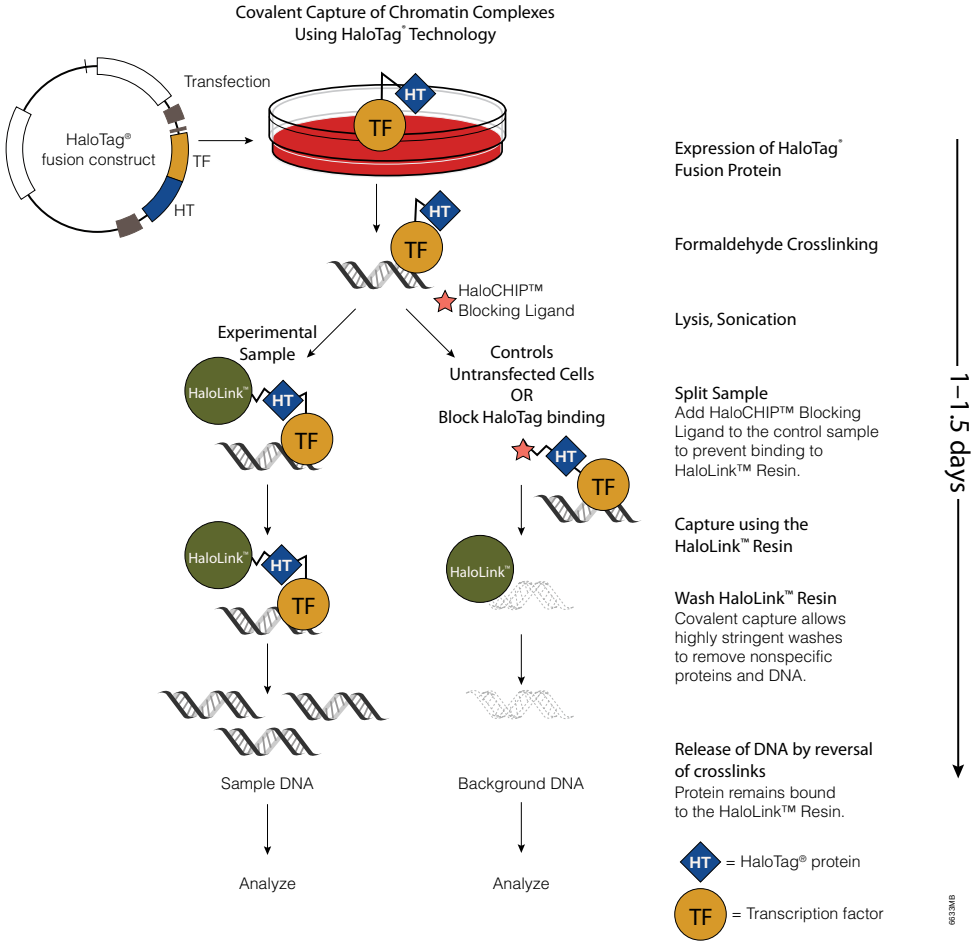
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The HaloCHIP™ System is a novel method designed for the covalent capture of intracellular protein:DNA complexes without the use of antibodies and offers an efficient and robust alternative to the standard chromatin immunoprecipitation (ChIP) method. Proteins of interest are expressed in cells as HaloTag® fusion proteins, crosslinked to DNA with formaldehyde and then captured on HaloLink™ Resin, which forms a highly specific, covalent interaction with the HaloTag® portion of the fusion protein. Stringent washing removes nonspecific proteins and DNA, and heating reverses the crosslinks between the DNA and the fusion protein and releases the captured DNA fragment, which subsequently can be purified.

Features:

- **No Requirement for Antibody:** No need to make your own or purchase expensive, qualified antibodies.
- **Obtain Results Faster:** Obtain data in 24–48 hours with fewer steps to minimize potential experimental errors.
- **Improved Signal-to-Noise Ratios:** Enables detection of small changes in protein binding patterns using a minimal number of cells.

Storage Conditions: The TE Buffer (pH 8.0), Reversal Buffer and Nuclease-Free Water may be stored at room temperature. Store the HaloLink™ Resin, Mammalian Lysis Buffer and High Salt Wash Buffer at 4°C. Store the HaloCHIP™ Blocking Ligand at –20°C.



Schematic diagram of the HaloCHIP™ System.

Available in the Helix® on-site stocking system

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FastBreak™ Cell Lysis Reagent

Product	Size	Cat.#
FastBreak™ Cell Lysis Reagent, 10X	15 ml	V8571
	60 ml	V8572
	100 ml	V8573

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: FastBreak™ Cell Lysis Reagent is designed for the efficient, gentle lysis of *E. coli* cultures without the need for centrifugation or mechanical cell disruption. The reagent is provided as a 10X concentrate and contains a proprietary nonionic detergent to facilitate lysis. Add the reagent directly to *E. coli* cultures. Following a brief incubation, the cells are disrupted, and the protein of interest is released. Recombinant proteins can be directly screened in the cell extract or purified by the addition of the appropriate affinity matrix such as the MagneHis™ Protein Purification System. This product is suitable for both manual and automated protocols.

Features:

- **Save Time:** Eliminate centrifugation or mechanical disruption.
- **Easy to Use:** Add and incubate.
- **Flexible:** Use manually or on a robotic platform.

Storage Conditions: Store at 4–25°C.

Protease Inhibitor Cocktail

Product	Size	Cat.#
Protease Inhibitor Cocktail, 50X	1 ml	G6521

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Protease Inhibitor Cocktail is used to prevent protein degradation after lysing cells. The product is a mixture of six different protease inhibitors with different target protease specificities. The inhibitor cocktail is EDTA-free and provided as a powder, ready for reconstitution in 1ml of either 100% ethanol or DMSO to obtain a 50X working solution.

Features:

- **Broad Specificity:** Inhibitor cocktail is effective against a diverse number of proteases.
- **Great Potency:** Reagent provides the best-in-class level of protease inhibition.
- **Highly Compatible:** Works with a wide array of protein fusion tags (e.g., Flag®, His tag, GST tag) and capture technologies. It is ideally suited for HaloTag® Technology-based approaches.

Storage Conditions: Store powdered Protease Inhibitor Cocktail at –30 to –10°C. Reconstituted Protease Inhibitor Cocktail can be stored at 2–10°C for 12 months.

Magnetic Systems for Purification of Antibodies and Affinity-Tagged Proteins

Magne™ Protein G and Magne™ Protein A Beads

Product	Size	Cat.#
Magne™ Protein G Beads, 20% Slurry	1 ml	G7471
	5 ml	G7472
	50 ml	G7473
Magne™ Protein A Beads, 20% Slurry	1 ml	G8781
	5 ml	G8782
	50 ml	G8783

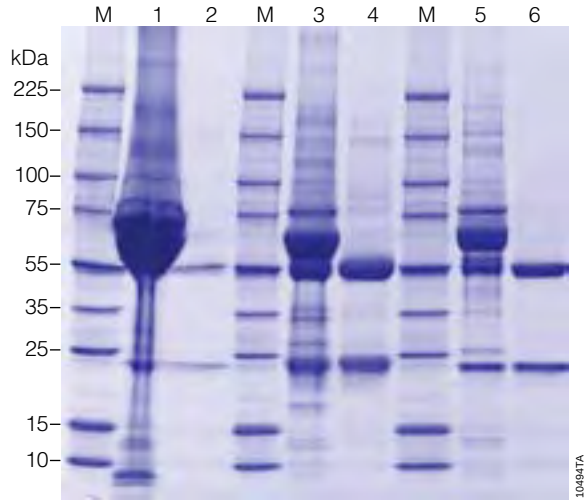
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Magne™ Protein G and Magne™ Protein A Beads are magnetic affinity beads with high specificity and high capacity for purification of immunoglobulins from cell culture media, ascites and serum samples. These paramagnetic beads are composed of iron encapsulated in macroporous cellulose with low nonspecific binding. The magnetic beads use a novel attachment chemistry to immobilize recombinant Protein G or Protein A protein molecules in the same orientation on the surface of the bead. The oriented attachment is known to improve the functionality of immobilized proteins. These beads offer a convenient method for achieving high purity and high recovery of monoclonal and polyclonal antibodies from a variety of biological samples. The superb magnetic properties of Magne™ Protein G and Magne™ Protein A Beads allow rapid and efficient capture of antibodies either with manually processed samples or in a high-throughput manner using the Promega ReliaPrep™ LV 32 HSM Instrument or a robotic platform such as the Beckman Coulter Biomek® FX.

Features:

- **High Capacity:** Binding capacities in excess of 25mg per milliliter of settled beads are observed depending on antibody species and isotype.
- **Ease of Handling:** Minimize losses during purification and increase sample throughput due to exceptional magnetic properties.
- **High Purity:** Ensure high-quality purification because of low nonspecific binding on beads.
- **Optimized Performance:** Use validated antibody purification methods for small (20µl) to medium (50ml) sample volumes.

Storage Conditions: Store at 4°C. Do not freeze. Do not allow beads to dry during storage or use.



IgG purified from various sample types using Magne™ Protein G Beads. Antibodies were purified from 50µl of cell culture medium (lanes 1 and 2), 50µl of mouse ascites (lanes 3 and 4) and 50µl of diluted goat serum (lanes 5 and 6). Starting material, lanes 1, 3 and 5; eluted/purified IgG, lanes 2, 4 and 6.

GST Protein Purification

MagneGST™ Protein Purification System

Product	Size	Cat.#
MagneGST™ Protein Purification System	40 reactions	V8600
	200 reactions	V8603
MagneGST™ Glutathione Particles	4 ml	V8611
	20 ml	V8612

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneGST™ Protein Purification System provides a simple, rapid and reliable method for the purification of glutathione-S-transferase (GST) fusion proteins. Immobilized glutathione paramagnetic particles (MagneGST™ Particles) are used to isolate GST-tagged protein directly from a crude or cleared lysate using either a manual or automated procedure and requires use of a magnetic stand. GST-tagged proteins can be purified on a small scale from 1ml of culture or on a large scale using more than 50ml of culture. Samples also can be processed using a robotic platform. MagneGST™ particles are supplied as a 25% slurry and have a binding capacity of 5–10mg of GST protein per 1ml of settled resin.

Features:

- **Simple:** One-step purification of multiple samples with easy handling.
- **Quick:** After cell lysis, no requirement for high-speed centrifugation to clear lysate.
- **Scalable:** Scalable protocol using 1–50ml of cell culture.
- **Efficient:** Achieve high yields with little or no nonspecific background.

Storage Conditions: The complete system consists of two individual parts, each with a different storage condition. Store individual boxes at specified temperatures of 4°C and –70°C.

MagneGST™ Pull-Down System

Product	Size	Cat.#
MagneGST™ Pull-Down System	80 reactions	V8870

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneGST™ Pull-Down System is designed for detection of protein interactions between GST-fusion proteins expressed in bacterial lysates and prey proteins expressed in the TnT® Systems. Prey protein synthesized in the TnT® Quick Coupled Transcription/Translation Reaction is captured using bait protein (GST-fusion protein) immobilized on MagneGST™ Particles. Nonspecifically bound proteins are then washed away, and the prey protein is analyzed. Prey proteins can be detected by incorporating radioactively labeled methionine in the TnT® Quick reaction, followed by SDS-PAGE and autoradiography or by incorporating the supplied non-radioactive methionine in the TnT® reaction and detecting by Western blotting with protein-specific antibodies (see figure).

Storage Conditions: Store the TnT® T7 Quick Master Mix and Methionine at –70°C. Store the RQ1 RNase-Free DNase at –20°C. Store the Nuclease-Free Water, MagneGST™ Glutathione Particles, MagneGST™ Binding/Wash Buffer and Cell Lysis Reagent at 4°C.

Maxwell® 16 Polyhistidine Protein Purification Kit

Product	Size	Cat.#
Maxwell® 16 Polyhistidine Protein Purification Kit	48 preps	AS1060
Available Separately	**Size**	**Cat.#**
Plungers	50 /pk	AS5201
Elution Tubes	50 /pk	AS5101

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Maxwell® 16 Polyhistidine Protein Purification Kit is used with the Maxwell® 16 Instrument to provide an easy method for the efficient, automated purification of polyhistidine-tagged protein from bacterial cultures and other sample types including mammalian and insect cells. With minor modifications, the reagents can also be used for purification of HQ-tagged proteins from bacterial cultures.

The Maxwell® Instrument is supplied with a preprogrammed purification procedure and reagent cartridges specifically designed to maximize simplicity and convenience. The instrument can process up to 16 samples in approximately 40 minutes. The purified protein is compatible with downstream applications such as gel electrophoresis and Western blot analysis.

Features:

- **Choose Your Sample Type:** Flexibility to purify from multiple starting cultures including bacterial culture, mammalian cells, insect cells and culture medium.
- **Have Confidence in Your Results:** Achieve consistent purification across all samples.
- **Save Hands-On Time:** Prefilled cartridges eliminate reagent preparation, multiple pipetting steps, centrifugation and additional sample manipulation.

Storage Conditions: Store at 4°C.

Available in the Helix® on-site stocking system

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MagneHis™ Protein Purification System

Product	Size	Cat.#
MagneHis™ Protein Purification System	65 reactions	V8500
	325 reactions	V8550
MagneHis™ Ni-Particles	2 ml	V8560
	10 ml	V8565

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagneHis™ Protein Purification System provides a simple, rapid and reliable method for the purification of polyhistidine- or HQ-tagged, expressed proteins. Paramagnetic precharged nickel particles (MagneHis™ Ni-Particles) are used to isolate polyhistidine- or HQ-tagged protein directly from a crude cell lysate using either a manual (requires use of a magnetic stand) or automated procedure. Using a tube format, polyhistidine- or HQ-tagged protein can be purified on a small scale using less than 1ml of culture or on a large scale using more than 1 liter of culture. Samples can be processed in a high-throughput manner using a robotic platform such as the Beckman Coulter Biomek® 2000 or FX or Tecan Genesis® RSP; validated methods are available at: **www.promega.com/automethods/**

Features:

- **Simple:** No centrifugation or vacuum is required once the cells are lysed.
- **Flexible:** MagneHis™ Ni-Particles are compatible with a variety of common buffers.
- **Efficient:** Binding capacity is up to 1mg of polyhistidine-tagged protein per 1ml of MagneHis™ Ni-Particles.

Storage Conditions: Store at 4°C.

MagZ™ Protein Purification System

Product	Size	Cat.#
MagZ™ Protein Purification System	30 reactions	V8830

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The MagZ™ Protein Purification System provides a simple, rapid and reliable method for the purification of expressed polyhistidine- or HQ-tagged proteins, which are 99% free of hemoglobin contamination, from rabbit reticulocyte lysate. Based on the use of proprietary, paramagnetic precharged particles, polyhistidine- or HQ-tagged protein can be isolated from 50–500µl of TnT® Coupled Transcription/Translation reactions. Polyhistidine- or HQ-tagged proteins bind to the particles in minutes, while unbound proteins are washed away, and the target protein is eluted with imidazole.

Features:

- **Specific:** Minimal hemoglobin (<0.1%) binding to the MagZ™ Binding Particles.
- **Quick:** No long incubations are required.
- **Versatile:** Binding/wash and elution conditions can be further optimized for individual polyhistidine- or HQ-tagged proteins.

Storage Conditions: Store at 4°C.

Biotin-Avidin Protein Purification Systems

SoftLink™ Soft Release Avidin Resin

Product	Size	Cat.#
SoftLink™ Soft Release Avidin Resin	1 ml	V2011
	5 ml	V2012

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: SoftLink™ Avidin Resin can be used for the isolation and purification of biotinylated molecules. SoftLink™ Resin is a rigid, methacrylate polymeric gel filtration matrix, functionalized with covalently bound, monomeric avidin. Monomeric avidin binds biotin with a K_d value of 10^{-7}M, allowing reversible binding of bound biotinylated proteins under mild elution conditions. Native, or tetrameric, avidin binds biotin with a very strong affinity ($K_d = 10^{-15}$M), which in turn requires strong denaturing conditions for eluting bound material. Monomeric avidin allows the specificity of capture but also the mildness of release appropriate for the purification of sensitive biological materials.

Features:

- **Sensitive:** Binds 20–40nmol of biotinylated protein per milliliter of resin.
- **Easy to Use:** Bound biotinylated molecules can be eluted under mild nondenaturing conditions (5mM biotin).
- **Versatile:** Retains biotin binding ability following exposure to a wide range of pH, low or high ionic strength, 6M guanidine and 1% SDS.
- **Reusable:** Regenerates at least 10 times without loss of binding capacity.
- **Robust:** Supports high flow rates (300cm/hour) and centrifugal forces (1,500 × *g*) in batch applications.
- **Flexible:** Purifications by batch or column method.

Storage Conditions: Store at 4°C.

PinPoint™ Xa Protein Purification System

Product	Size	Cat.#
PinPoint™ Xa Protein Purification System	1 system	V2020
Available Separately	**Size**	**Cat.#**
PinPoint™ Xa-1 Vector	10 µg	V2031

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The PinPoint™ Xa Protein Purification System is designed for the production and purification of fusion proteins that are biotinylated in vivo. The DNA coding for the protein of interest is cloned into a PinPoint™ Vector downstream of a sequence encoding a peptide that becomes biotinylated in vivo. Biotinylated fusion proteins are produced in *E. coli* and are affinity-purified using the SoftLink™ Soft Release Avidin Resin. This proprietary resin allows elution of the fusion protein under nondenaturing conditions. The PinPoint™ Vectors feature the encoded endoproteinase Factor Xa (pronounced "ten a") proteolytic site that provides a way to separate the purification tag from the native protein, and the vectors carry a convenient multiple cloning region for ease in construction of fusion proteins.

The system contains vectors in all possible sense reading frames, an avidin-conjugated resin, Streptavidin-Alkaline Phosphatase, a purification column and biotin. The PinPoint™ Xa Control Vector contains the chloramphenicol acetyltransferase (CAT) gene and is provided as a means of monitoring protein expression, purification and processing conditions. The system generally yields 1–5mg of protein per liter of culture.

Features:

- **In vivo Biotinylation Tag:** Allows purification of fusion proteins; many proteins produced have been soluble.
- **Easy to Use:** Purification of biotinylated proteins with the SoftLink™ Resin can be performed by column or batch purification.
- **Easy Detection:** Streptavidin Alkaline Phosphatase can be used to detect the biotinylated fusion protein in a pseudo-Western format to monitor purification.
- **Flexible:** PinPoint™ Vectors are supplied for all reading frames.
- **Gentle Release Conditions:** SoftLink™ Resin allows release of the fusion protein under nondenaturing conditions.
- ***tac Promoter:*** Allows tightly regulated expression.

Storage Conditions: Store the PinPoint™ Purification Column at room temperature. Store all remaining components at 4°C. The vectors may be stored at –20°C.

PinPoint™ Vector Sequencing Primer

Product	Size	Cat.#
PinPoint™ Vector Sequencing Primer	2 µg	V4211
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The PinPoint™ Vector Sequencing Primer is designed for sequencing inserts cloned into the PinPoint™ Xa Vectors (components of Cat.# V2020). The primer hybridizes upstream of the Factor Xa site at nucleotides 325–343, approximately 40–50 base pairs upstream of the multiple cloning region and can be used to determine if an insert is cloned in-frame with the biotinylation purification tag of the PinPoint™ Xa Vectors. The sequence of the PinPoint™ Vector Sequencing Primer is 5′-d(CGTGACGCGGTGCAGGGCG)-3′. It is supplied dried.

Features:

- **Performance Tested:** The PinPoint™ Vector Sequencing Primer is tested in double-stranded sequencing reactions with circular PinPoint™ Vectors.

Storage Conditions: Store at –20°C.

Streptavidin

Product	Size	Cat.#
Streptavidin	1 mg	Z7041
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 20.

Streptavidin Alkaline Phosphatase

Product	Size	Cat.#
Streptavidin Alkaline Phosphatase	0.5 ml	V5591
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 20.

Protein Interactions

CheckMate™/Flexi® Vector Mammalian Two-Hybrid System

Product	Size	Cat.#
CheckMate™/Flexi® Vector Mammalian Two-Hybrid System	1 each	C9360
Available Separately	**Size**	**Cat.#**
pFN10A (ACT) Flexi® Vector	20 µg	C9331
pFN11A (BIND) Flexi® Vector	20 µg	C9341
pGL4.31[*luc2P/GAL4*UAS/Hygro] Vector	20 µg	C9351
CheckMate™ Positive Control Vectors	1 set	C9370
CheckMate™ Negative Control Vectors	1 set	C9380
Flexi® System, Entry/Transfer	5 entry and 20 transfer reactions	C8640
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The CheckMate™/Flexi® Vector Mammalian Two-Hybrid System provides a means to confirm, validate and study suspected interactions between two proteins or domains and can also be used to generate stable cell lines for cell-based assays. Developed primarily for mammalian proteins of interest, the system can allow protein expression and post-translational modifications in an environment mimicking the native cell milieu. It is patterned on the yeast two-hybrid system with one protein of interest ("X") fused to a DNA-binding domain and the other protein ("Y") fused to a transcriptional activation domain.

The system relies upon three plasmids that are co-transfected into mammalian cells, each plasmid having unique features. The pFN10A (ACT) Flexi® Vector contains a herpes simplex virus VP16 transcriptional activation domain upstream of the cloning site, and the pFN11A (BIND) Flexi® Vector contains the yeast GAL4DNA-binding domain upstream of the cloning site. The pFN11A (BIND) Flexi® Vector also expresses the *Renilla reniformis* luciferase under the control of the SV40 promoter, allowing normalization for differences in transfection efficiency. The third vector, pGL4.31[*luc2P/GAL4*UAS/Hygro] Vector, contains five GAL4 binding sites upstream of a minimal TATA box, which is upstream of a firefly luciferase gene that acts as a reporter for interactions between proteins X and Y.

This system differs from the original CheckMate™ Mammalian Two-Hybrid System in that the vectors are compatible with the Flexi® Vector System, which allows directional cloning and rapid, efficient and high-fidelity transfer of protein coding regions between a variety of Flexi® Vectors.

Features:

- **Mammalian-Based System:** Interactions can be studied in the cell line of choice. Proteins are more likely to be in their native conformation. Post-translational modifications, such as glycosylation, phosphorylation and acylation, are better maintained.
- **Versatile:** Vectors are based on the Flexi® Cloning technology, enabling convenient transfer of protein-coding regions for additional functional proteomics applications.
- **Convenient:** The Dual-Luciferase® Reporter Assay System is used for detection.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

CheckMate™ Mammalian Two-Hybrid System

Product	Size	Cat.#
CheckMate™ Mammalian Two-Hybrid System	1 system	E2440

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Two-hybrid systems are extremely powerful methods for detecting protein:protein interactions in vivo. The basis of two-hybrid systems is the modular domains found in some transcription factors: a DNA-binding domain, which binds to a specific DNA sequence, and a transcriptional activation domain, which interacts with the basal transcriptional machinery. A transcriptional activation domain in association with a DNA-binding domain will promote the assembly of RNA polymerase II complexes at the TATA box and increase transcription. In the CheckMate™ Mammalian Two-Hybrid System the DNA-binding domain and the transcriptional activation domain, produced by separate plasmids, are closely associated when one protein ("X") fused to a DNA-binding domain interacts with a second protein ("Y") fused to a transcriptional activation domain. In this system, interaction between proteins X and Y results in transcription of a reporter gene.

Features:

- **Mammalian System:** Interactions can be studied in the cell line of choice. Proteins are more likely to be in their native conformation. Post-translational modifications, such as glycosylation, phosphorylation and acylation, are better maintained.
- **Convenient Quantitation:** The Dual-Luciferase® Reporter Assay System is used for detection.
- **Internal Control:** *Renilla* luciferase normalizes transfection efficiency.
- **Fast Transient Assay:** Results obtained two days after transfection, as compared to 3–4 days with the yeast system.
- **Stable Transfectants:** The pACT Vector contains the neomycin phosphotransferase gene, which allows for selection of stable transfectants.

Storage Conditions: Store at –20°C.

HaloLink™ Protein Array System

Product	Size	Cat.#
HaloLink™ Array Six Slide System	6 slides	G6190
HaloTag® Standard Protein	30 µg	G4491
Protein G HaloTag® Fusion Protein	5 mg	G7291

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For additional information see page 310.

Magne™ HaloTag® Beads

Product	Size	Cat.#
Magne™ HaloTag® Beads, 20% Slurry	1 ml	G7281
	5 ml	G7282

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For additional information see page 310.

HaloCHIP™ System

Product	Size	Cat.#
HaloCHIP™ System	20 reactions	G9410
Available Separately	**Size**	**Cat.#**
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
HaloTag® Flexi® Vectors—CMV Deletion Series Sample Pack	9 × 2 µg	G3780

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 311.

HaloLink™ Resin

Product	Size	Cat.#
HaloLink™ Resin	1.25 ml	G1912
	2.5 ml	G1913
	10 ml	G1914
	25 ml	G1915

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 309.

HaloTag® Mammalian Pull-Down Systems

Product	Size	Cat.#
HaloTag® Complete Pull-Down System	1 each	G6509
HaloTag® Mammalian Pull-Down and Labeling System	24 reactions	G6500
HaloTag® Mammalian Pull-Down System	24 reactions	G6504
HaloTag® Control Vector	20 µg	G6591
Available Separately	**Size**	**Cat.#**
Protease Inhibitor Cocktail, 50X	1 ml	G6521
Mammalian Lysis Buffer	40 ml	G9381

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 308.

MagneGST™ Pull-Down System

Product	Size	Cat.#
MagneGST™ Pull-Down System	80 reactions	V8870
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 313.

Protease Inhibitor Cocktail

Product	Size	Cat.#
Protease Inhibitor Cocktail, 50X	1 ml	G6521
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 19.

Gel Shift Assay Systems

Product	Size	Cat.#
Gel Shift Assay Core System	100 reactions	E3050
Gel Shift Assay System	100 reactions	E3300
Available Separately	**Size**	**Cat.#**
HeLaScribe® Nuclear Extract, Gel Shift Assay Grade	3 × 40 µl	E3521
Gel Shift Binding 5X Buffer	5 × 200 µl	E3581
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The gel shift or electrophoretic mobility shift assay provides a simple and rapid method for detecting DNA-binding proteins. This method is widely used to study sequence-specific DNA-binding proteins such as transcription factors. The assay is based on the observation that complexes of protein and DNA migrate through a nondenaturing polyacrylamide gel more slowly than free DNA fragments or double-stranded oligonucleotides. The gel shift assay is performed by incubating a purified protein or a complex mixture of proteins (such as nuclear or cell extract preparations) with a ^{32}P end-labeled DNA fragment containing the putative protein binding site. The reaction products are then analyzed on a nondenaturing polyacrylamide gel. The specificity of the DNA-binding protein for the putative binding site is established by competition experiments using unlabeled DNA fragments or oligonucleotides containing a binding site for the protein of interest or other unrelated DNA sequences.

The Core System (Cat.# E3050) includes HeLa Nuclear Extract and SP1 and AP2 Consensus Oligos that can be used as positive controls and serve as a reliable system for obtaining experience with gel shift assays. In addition, the Core System contains T4 Polynucleotide Kinase and Kinase 10X Buffer for labeling oligonucleotides as well as Gel Shift Binding 5X Buffer. Cat.# E3300 contains all of the above plus consensus oligos for AP1, OCT1, CREB, NF-κB, and TFIID.

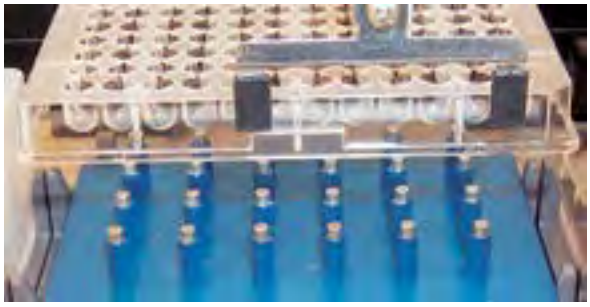
Features:

- **Positive Controls:** The Gel Shift Assay Core System includes a HeLa Nuclear Extract and consensus oligonucleotides for AP2 and SP1.
- **Versatile:** Oligonucleotides can be 5′ end-labeled and used as protein-specific probes or used as unlabeled oligonucleotides in competition assays.

Storage Conditions: Store HeLa Nuclear Extract at –70°C. Store other components at –20°C.

Magnetic Stands and Spacers

Product	Size	Cat.#
MagnaBot® 384 Magnetic Separation Device	1 each	V8241
384-Well Plate, Flat	10 /pk	V5291
384-Well Plate, Conical	10 /pk	V5311
V8241 For Laboratory Use. V5291, V5311 For Research Use Only. Not for Use in Diagnostic Procedures.		



2889TA03_0A

MagnaBot® 96 Magnetic Separation Device (Cat.# V8151) with a 96-well Collection Plate and robotic gripper arm.

3373TA05_1A

Plate Stand (Cat.# V8261).

3375TA05_1A

Plate Clamp 96 (Cat.# V8251) with a 96-well PCR plate.

Available in the Helix® on-site stocking system

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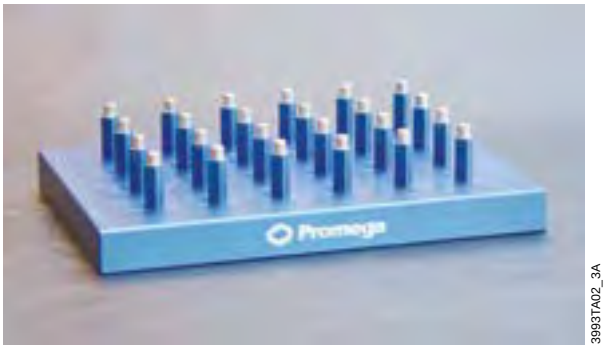
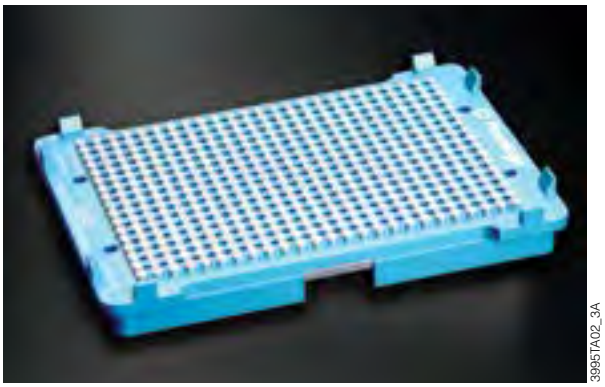
MagnaBot® II Magnetic Separation Device (Cat.# V8351).



MagnaBot® 96 Magnetic Separation Device (Cat.# V8151).



MagnaBot® 384 Magnetic Separation Device (Cat.# V8241).

Product	Size	Cat.#
MagnaBot® 96 Magnetic Separation Device	1 each	V8151
MagnaBot® II Magnetic Separation Device	1 each	V8351
MagnaBot® Flat Top Magnetic Separation Device	1 each	V6041
Plate Clamp 96	1 each	V8251
Plate Stand	1 each	V8261
Deep Well MagnaBot® 96 Magnetic Separation Device	1 each	V3031
Heat Transfer Block	1 each	Z3271
Heat Block Insert	1 each	Z3651

For Research Use Only. Not for Use in Diagnostic Procedures.

MagneSphere® Technology Magnetic Separation Stand (twelve-position) (Cat.# Z5341, Z5342, Z5343).

PolyATtract® System 1000 Magnetic Separation Stand (Cat.# Z5410).

MagneSphere® Technology Magnetic Separation Stand (two-position) (Cat.# Z5331, Z5332, Z5333).

Product	Size	Cat.#
MagnaBot® Spacer 3/16 inch	1 each	V8381
MagnaBot® Spacer 1/8 inch	1 each	V8581
MagnaBot® Spacer 1/16 inch	1 each	V8681
1/4 inch Foam Spacer	1 each	Z3301

For Research Use Only. Not for Use in Diagnostic Procedures.

Product	Size	Cat.#
MagneSphere® Technology Magnetic Separation Stand (two-position)	0.5 ml	Z5331
	1.5 ml	Z5332
	12 × 75 mm	Z5333
MagneSphere® Technology Magnetic Separation Stand (twelve-position)	0.5 ml	Z5341
	1.5 ml	Z5342
	12 × 75 mm	Z5343
PolyATtract® System 1000 Magnetic Separation Stand	1 each	Z5410

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18 Reporter Assays and Transfection

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

NanoLuc® Luciferase Reporter Systems

Nano-Glo® Luciferase Assay System

Product	Size	Cat.#
Nano-Glo® Luciferase Assay	10 ml	N1110
	10 × 100 µl	N1150
	100 µl	N1120
	10 × 10 ml	N1130

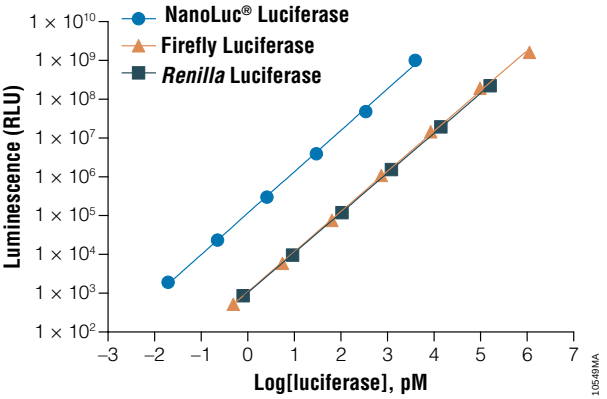
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Nano-Glo® Luciferase Assay System provides a simple, single-addition reagent that generates a glow-type signal in the presence of NanoLuc® luciferase with a half-life of approximately 120 minutes in commonly used tissue culture media. The reagent is prepared by mixing Nano-Glo® Luciferase Assay Substrate and Nano-Glo® Luciferase Assay Buffer. The reagent contains an integral lysis buffer allowing use directly on cells expressing NanoLuc® luciferase or in the culture media when luciferase is secreted.

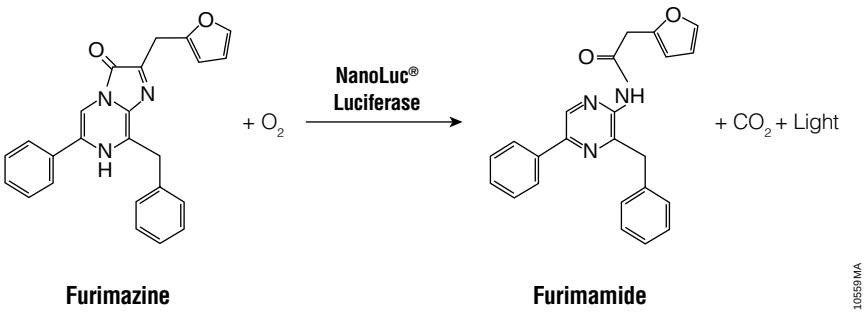
Nano-Glo® Luciferase Assay Reagent is a dedicated product for the detection of NanoLuc® Luciferase. For more details on NanoLuc® Luciferase, visit the NanoLuc® Luciferase Technology page.

Features:

- **Advanced Reporter System:** Bright NanoLuc® reporter allows use in challenging applications where sensitivity is limited.
- **Simplified Assay Optimization:** Add-and-read simplicity allows scaling from bench to HTS.
- **Improved Assay Precision:** No need for separate lysis and reagent injection steps.
- **Brighter, Longer-Lasting Signal:** Extended bright light output is optimized for batch and continuous-process handling.
- **Greater Sensitivity:** Low background formulation offers increased sensitivity.



A comparison of the sensitivity of NanoLuc®, firefly and *Renilla* luciferase assays.



The bioluminescent reaction catalyzed by NanoLuc® luciferase.

Dual-Luciferase Reporter Systems

Dual-Glo® Luciferase Assay System

Product	Size	Cat.#
Dual-Glo® Luciferase Assay System	10 ml	E2920
	100 ml	E2940
	10 × 100 ml	E2980

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Dual-Glo® Luciferase Assay System is a homogeneous reagent system that enables fast and simple quantitation of a stable luminescent signal from two reporter genes in a single sample. This convenient "add-and-read" system generates both firefly and *Renilla* luciferase luminescence signals from cells that have not been preconditioned or prelysed. The Dual-Glo® Luciferase Assay System provides high Z′-factors for cell-based, high-throughput screening applications. With the Dual-Glo® System, internal controls can be established to minimize sample variability by reducing false-positive and false-negative readings caused by nonspecific factors such as cytotoxicity. In the Dual-Glo® Luciferase Assay, the activity of the primary reporter is correlated with the effect of specific stimuli, and the activity of the co-transfected control reporter provides an internal control to normalize results. The system is optimized for batch processing of both 96- and 384-well plates and is compatible with a wide variety of mammalian cell culture media.

Features:

- **Increased Precision and Accuracy:** Normalize primary reporter results with an internal control, a co-reporter that minimizes effects of cell number and health, transfection efficiency and nonspecific cellular responses.
- **Homogeneous Format:** Perform fewer steps. Assay cells directly in growth medium for both reporters. No centrifugation or lysis steps required.
- **Stable Signal:** Obtain flexibility for either batch or continuous processing of 96- and 384-well plates. Each luminescent signal can be measured for up to 2 hours after reagent addition.
- **Convenience:** Screen efficiently with simple, two-step assay ideal for any luminometer. On-board injectors not required.
- **Wide Dynamic Range:** Analyze high and low reporter activity without sample dilution. Linear over at least 6 logs of enzyme concentration for each reporter.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Dual-Glo® Substrates at –20°C. Store Dual-Glo® Buffers below 25°C.

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Dual-Luciferase® Reporter Assay System

Product	Size	Cat.#
Dual-Luciferase® Reporter Assay System	100 assays	E1910
Dual-Luciferase® Reporter Assay System 10-Pack	1,000 assays	E1960
Dual-Luciferase® Reporter 1000 Assay System	1,000 assays	E1980
Available Separately	**Size**	**Cat.#**
Passive Lysis 5X Buffer	30 ml	E1941

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Dual-Luciferase® Reporter (DLR™) Assay System provides an efficient means of performing two reporter assays. In the DLR™ Assay, the activities of firefly (*Photinus pyralis*) and *Renilla* (*Renilla reniformis* or sea pansy) luciferases are measured sequentially from a single sample. The firefly luciferase reporter is measured first by adding Luciferase Assay Reagent II (LAR II) to generate a luminescent signal lasting at least one minute. After quantifying the firefly luminescence, this reaction is quenched and the *Renilla* luciferase reaction is initiated simultaneously by adding Stop & Glo® Reagent to the same sample. Both assays can be completed in about 4 seconds using a luminometer with reagent auto-injectors. In the DLR™ Assay System, both reporters yield linear assays with attomole ($<10^{-18}$) sensitivities and no endogenous activity in the experimental host cells. Furthermore, the integrated format of the DLR™ Assay provides rapid quantitation of both reporters either in transfected cells or in cell-free transcription/translation reactions.

For best results with the Dual-Luciferase® Assay, Promega recommends using a luminometer that has been validated for use with the assay. These luminometers are qualified as DLR*eady*™. For a listing of qualified instruments, please visit the DLR*eady*™ Validated Luminometers page.

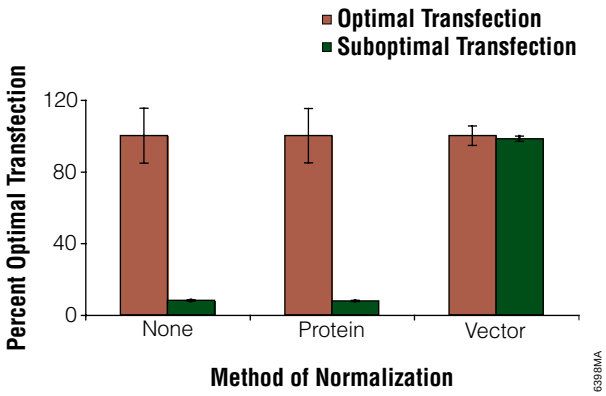
The pGL4 Luciferase Reporter Vectors are designed for use with the DLR™ Assay Systems. A *Renilla* luciferase vector with constitutive expression may be used in combination with any experimental firefly luciferase vector to co-transfect mammalian cells.

Notice for Cat.# E1960 and E1980: Sufficient Passive Lysis Buffer is provided to perform 1,000 assays with cells grown in 96-well plates (typically 20µl of 1X PLB per well). For applications requiring more lysis reagent (e.g., >100µl/well), additional Passive Lysis Buffer may be purchased separately.

Features:

- **Greater Accuracy:** *Renilla* luciferase internal control allows more accurate results.
- **Convenience:** Samples don't have to be split; saves plates and time.
- **Sensitivity:** Allows study of weak promoters, low-level expression/regulation and expression in cells that transfect poorly.
- **Linearity:** Range extends 7 logs; very active samples typically do not need dilution.

Storage Conditions: Store at –20°C.



Effect of transfection conditions on reporter results analyzed using different normalization methods. HEK 293 cells were transfected with pGL4.13[*luc2*/SV40] expressing firefly luciferase and pGL4.74[*hRluc*/TK] expressing *Renilla* luciferase. Transfections were performed using both optimal and suboptimal lipid:DNA ratios (indicated as Optimal and Suboptimal Transfection conditions). Firefly and *Renilla* luciferase activities were measured using the Dual-Luciferase® Reporter Assay System (Cat.# E1960). Protein concentrations were determined using the Coomassie® Plus Bradford Reagent (Pierce). Firefly luciferase data were either not normalized (None), normalized to total protein (Protein), or normalized to *Renilla* luciferase activity (Vector). Data represent the average ± standard deviation of triplicate samples and are expressed as a percent of the optimal transfection for each normalization condition.

Chroma-Glo™ Luciferase Assay System

Product	Size	Cat.#
Chroma-Glo™ Luciferase Assay System	10 ml	E4910
	100 ml	E4920

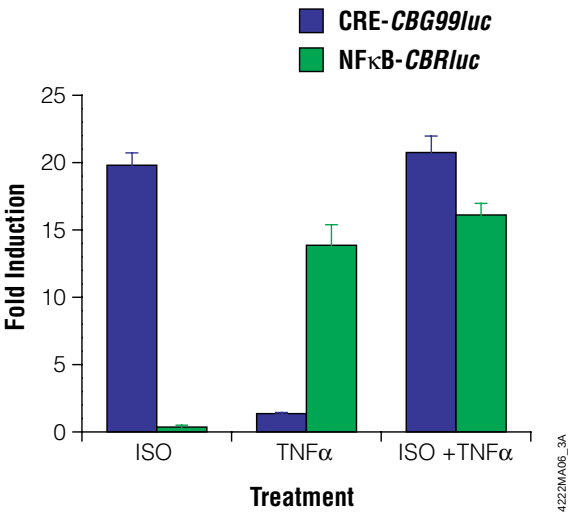
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Chroma-Glo™ Luciferase Assay System and the Chroma-Luc™ Vectors provide a method to generate red and green (dual-color) luminescence from a single sample upon a single-reagent addition. Filtered measurement of the dual-color luminescence produced by the Chroma-Luc™ luciferases permits each reporter to be measured independently and virtually simultaneously. The Chroma-Glo™ Assay is in a homogeneous format that generates luminescence with >30-minute signal half-lives for each of the Chroma-Luc™ luciferases, thereby enabling the processing of many plates without prior sample handling. Use the high-homology Chroma-Luc™ luciferases to establish an ideal internal control for normalizing cytotoxicity in down-regulation applications and for decreasing inter- and intrasample variability. You can also use the reporters to multiplex experimental reporters to increase the data content from cell-based assays.

Features:

- **Measure Dual Reporters Using a Single Substrate Addition:** Increase your accuracy and precision through normalization, or use both reporters to multiplex experimental measurements. Use filters to spectrally separate the luminescent signals.
- **Establish the Ideal Control or Multiplexed System:** Use the high-homology red and green luciferases to minimize potential RNA and protein effects on reporter expression.
- **Increase Your Throughput:** Use the stable luminescence for batch or continuous processing of multiple plates.
- **Perform Fewer Steps:** Add Chroma-Luc™ Reagent directly to cells in medium, then measure.
- **Automate This Assay:** Validated automated methods available at: **www.promega.com/automethods/**
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the Chroma-Glo™ Substrate at –20°C. Store the Chroma-Glo™ Assay Buffer below 25°C.



Using the Chroma-Luc™ Technology to monitor two independent experimental signals from the same sample. DNA segments containing either CRE or the NFκB consensus sequence were cloned into pCBG99-Basic (Cat.# E1431) or pCBR-Basic (Cat.# E1411). The resulting constructs, pCRE-CBG99-*luc* and pNFκB-CBR*luc*, were cotransfected into 293 cells. At 24 hours post transfection, the cells received one of three treatments: ISO (1µM)/RO(100µM), TNFα (0.1µg/ml)/RO(100µM), or ISO(1µM)/RO(100µM) plus TNFα (0.1µg/ml). Only RO(100µM) was added to the Control wells. At six hours post treatment, cells were harvested and assayed with the Chroma-Glo™ Reagent. Relative light units were measured using the Mithras LB940 (Berthold Technologies) configured with a red filter (610 long pass) and a green filter (510/60). The red and green signals were deciphered by using the Chroma-Luc™ Calculator (available as a downloadable file at: **www.promega.com/chromacalc/**). Fold inductions were calculated by dividing the three treatments by the RO Control.

ADCC Reporter Bioassay, Target Kit (Raji)

Product	Size	Cat.#
ADCC Reporter Bioassay, Target (Raji)	1 each	G7016
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 32.

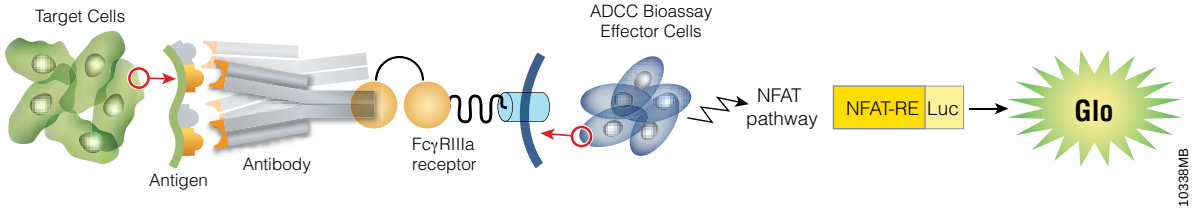


Figure 1. ADCC Reporter Bioassay Schematic. Readout is luminescence signal from NFAT response element driving expression of firefly luciferase.

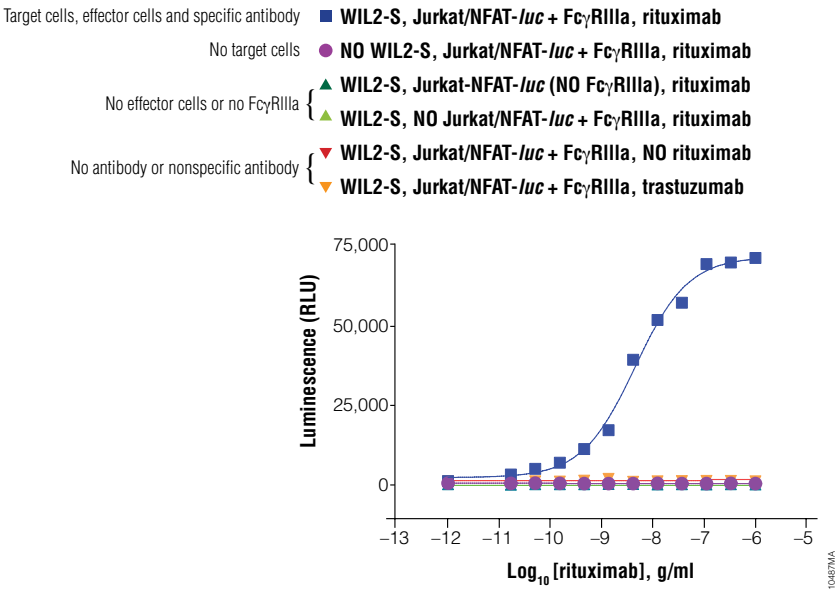


Figure 2. Specificity of the ADCC Reporter Bioassay. Serial dilutions of rituximab (anti-CD20 chimeric monoclonal antibody drug), trastuzumab (anti-Her2 humanized monoclonal antibody drug) or assay medium control (no antibody) were incubated for 6 hours of induction at 37°C with engineered Jurkat effector cells (ADCC Bioassay Effector Cells) with or without ADCC Bioassay Target Cells (WIL2-S), as indicated. Luciferase activity was quantified using Bio-Glo™ Reagent. Data were fitted using 4PL curve fitting of GraphPad Prism® software.

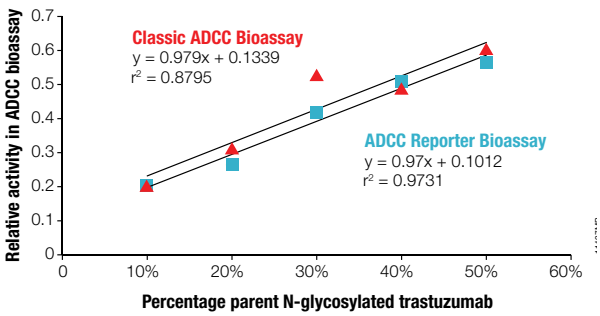


Figure 3. ADCC Reporter Bioassay provides antibody activity ranking equivalent to classic LDH release ADCC bioassay. The graph shows correlation of relative ADCC activity with fraction of trastuzumab N-glycosylation. For the experiment, trastuzumab was N-deglycosylated using PNGase F, blended with fully N-glycosylated parent preparations to create test samples representing different % N-glycosylation (indicated on the X-axis) and assayed using either the ADCC Reporter Bioassay or a lytic LDH release ADCC bioassay in which PBMCs were used as effector cells. Target cells were SK-BR-3. For the ADCC Reporter Bioassay, ADCC pathway activation was measured by quantification of luciferase activity in the effector cell; for classic ADCC bioassay, LDH release from target cells was measured. For both assays, biological activity reflects downstream effects of effector cell FcγRIIIa crosslinking by antibody bound to target cells. Biological activity was determined and expressed relative to fully N-glycosylated trastuzumab, then plotted against percent N-glycosylated trastuzumab.

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ADCC Reporter Bioassay, Complete Kit (Raji)

Product	Size	Cat.#
ADCC Reporter Bioassay, Complete (Raji)	1 each	G7015
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 32.

ADCC Bioassay Effector Cells, Propagation Model

Product	Size	Cat.#
ADCC Bioassay Effector Cells, Propagation Model	1 each	G7102
Not For Medical Diagnostic Use.		

For additional information see page 35.

Bio-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bio-Glo™ Luciferase Assay System	100 ml	G7940
	10 ml	G7941
Not For Medical Diagnostic Use.		

For additional information see page 30.

ONE-Glo™ Luciferase Assay System

Product	Size	Cat.#
ONE-Glo™ Luciferase Assay System	10 ml	E6110
	100 ml	E6120
	1 L	E6130

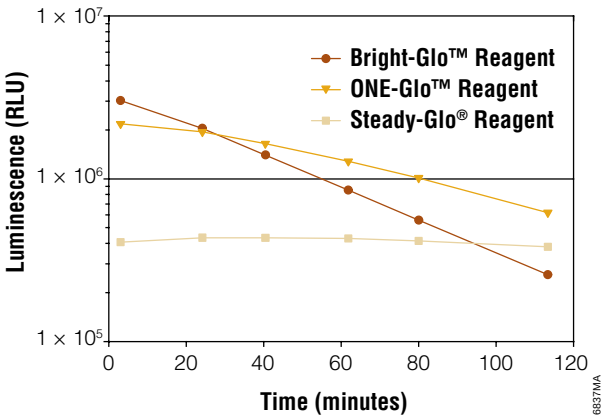
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ONE-Glo™ Luciferase Assay System provides a highly sensitive, robust, homogeneous assay for detection of firefly luciferase reporter gene expression in mammalian cells. Ideally suited for high- and ultrahigh-throughput applications, the ONE-Glo™ Assay contains a new luciferase substrate, resulting in a reagent that is more stable, more tolerant to sample components, and has less odor than standard luciferase assay reagents. These features ensure that the ONE-Glo™ Assay provides robust performance and also eliminates many of the handling inconveniences experienced using other reporter assays in a high-throughput setting.

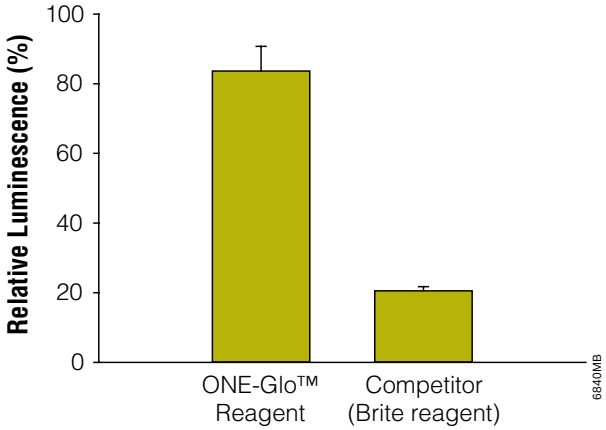
Features:

- **Simplified Assay Optimization:** Robust performance, reduced odor, improved storage and larger available sizes.
- **Room Temperature or 4°C Storage:** Extended stability of the ONE-Glo™ Reagent makes it more convenient for everyday use.
- **Improved Assay Precision:** The ONE-Glo™ Reagent is less sensitive to mixing and dispensing conditions, enhancing reproducibility. Ideal for use in high-density (384- and 1536-well) microplates.
- **Brighter, Longer-Lasting Signal:** Optimized for batch and continuous-process handling, the extended bright light output allows high sensitivity, especially for extended incubations.
- **Reduced Unwanted Effects from Sample Components:** The ONE-Glo™ Assay is less sensitive to culture media, phenol red and luciferase inhibitors than other luciferase assays.

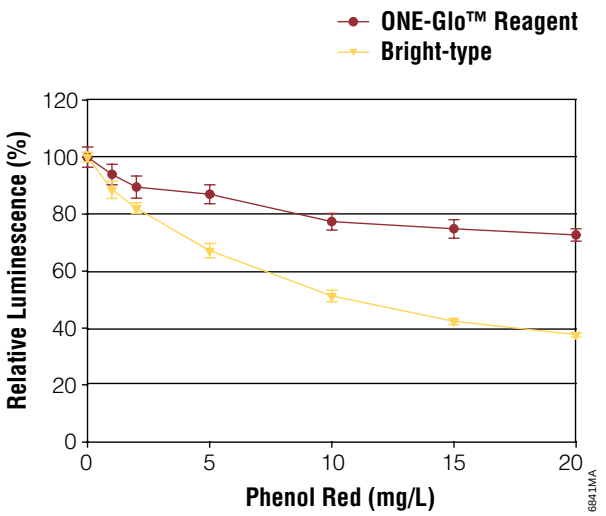
Storage Conditions: Store the ONE-Glo™ Luciferase Assay System components at –20°C. Please refer to the Technical Manual for other storage options, including room-temperature storage.



ONE-Glo™ Reagent generates bright and stable luminescence that can easily be measured for multiple hours. Samples in 96-well plates consisted of 50µl of purified firefly luciferase (14.9ng/ml with 0.1% Prionex®) combined with 50µl of the respective reagent. Luminescence was measured (1.0 second integration/well) at 3 minutes and periodically for almost 2 hours. All coefficients of variation were < 3%; n = 3.



ONE-Glo™ Reagent protects the luciferase reaction in the presence of resveratrol, a known luciferase inhibitor (Bakhtiarova, A. *et al.* (2006) *Biochem. Biophys. Res. Comm.* **351**, 481–4). Luciferase reactions generated by ONE-Glo™ Reagent or another bright-type reagent were initiated in the presence or absence of 10µM resveratrol. Luminescence was initiated and measured by the method noted in the figure above. The relative luminescence is the luminescence from reactions containing resveratrol/ luminescence from reactions without resveratrol x 100; n = 3.



ONE-Glo™ Reagent is more tolerant of phenol red than luciferin-based reagents. Luciferase reactions composed of 14.9ng/ml luciferase in phenol red-free RPMI medium (with 0.1% Prionex®) and ONE-Glo™ Reagent or another bright-type reagent were initiated in the presence of varied amounts of phenol red. Relative luminescence is the luminescence of reactions containing phenol red/ luminescence from reactions without phenol red x 100; n = 3.

Available in the Helix® on-site stocking system
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ONE-Glo™ + Tox Luciferase Reporter and Cell Viability Assay

Product	Size	Cat.#
ONE-Glo™ + Tox Luciferase Reporter and Cell Viability Assay	1 plate	E7110
	10 plates	E7120

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The ONE-Glo™ + Tox Assay combines luciferase assay chemistry with a cell viability marker to better understand reporter gene expression in the context of cell health. The assay uses a two-step, addition-only process to make these measurements in a single well of a plate, negating the need to run parallel assays.

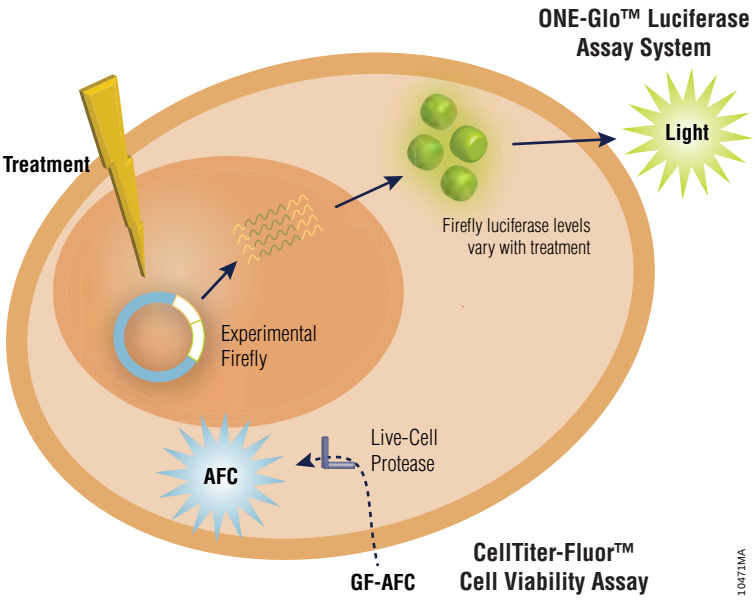
The first part of the assay is a nonlytic fluorescence assay (CellTiter-Fluor™ Cell Viability Assay) that measures the relative number of live cells in a culture population after experimental manipulation. The CellTiter-Fluor™ Assay measures a conserved and constitutive protease activity within live cells and therefore serves as a marker of cell viability. The live-cell protease activity is restricted to intact viable cells and is measured using a fluorogenic, cell-permeant peptide substrate (glycylphenylalanyl-aminofluorocoumarin; GF-AFC). The substrate enters intact cells where it is cleaved by the live-cell protease to generate a fluorescent signal proportional to the number of living cells. This live-cell protease becomes inactive upon loss of cell membrane integrity and leakage into the surrounding culture medium. Fluorescence of the free AFC fluorophore is measured with a microplate reader or CCD imager using an excitation wavelength of 380–400nm and emission wavelength of 505nm.

The second part of the assay uses the ONE-Glo™ Luciferase Assay System to quantify firefly luciferase reporter gene expression from cells made to express this reporter enzyme. The ONE-Glo™ Luciferase Assay Buffer and ONE-Glo™ Luciferase Assay Substrate, provided with this system, are combined to form the ONE-Glo™ Reagent. Ideally suited for high- and ultrahigh-throughput applications, the ONE-Glo™ Assay contains a new fluoroluciferin substrate, resulting in a reagent that is more stable, more tolerant to sample components, and has less odor than standard luciferase assay reagents. Luminescence is measured with a microplate reader or CCD imager.

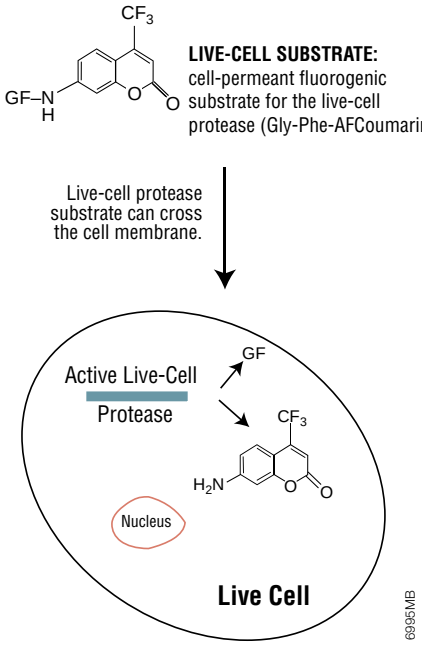
Features:

- **Acquire More Data:** Measure cell viability and firefly luciferase expression in the same assay well.
- **Better Biology:** Understand reporter gene expression in the context of cell viability.
- **Easy to Perform:** The assay uses a simple sequential "add-mix-read" format.
- **Flexible and Automation-Friendly:** The volumes of each assay component can be scaled to meet throughput needs, up to 1,536-well format.

Storage Conditions: Store the ONE-Glo™ + Tox Luciferase Reporter and Cell Viability Assay components at –20°C. Please refer to the Technical Manual for other storage options.



Schematic of the ONE-Glo™ + Tox Luciferase Reporter and Cell Viability Assay.



The CellTiter-Fluor™ Cell Viability Assay chemistry portion of the One-Glo™ + Tox Assay is a nonlytic fluorescent assay that measures the relative number of live cells in a culture population after experimental manipulation.

Steady-Glo® Luciferase Assay System

Product	Size	Cat.#
Steady-Glo® Luciferase Assay System	10 ml	E2510
	100 ml	E2520
	10 × 100 ml	E2550

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High-throughput quantitation of firefly (*Photinus pyralis*) luciferase expression in mammalian cells is commonly performed by batch processing of 96- and 384-well plates. Steady-Glo® Luciferase Assay System is designed for this purpose by providing long-lived luminescence when added to cultured cells. The homogeneous assay provides signal half-lives of over 5 hours in commonly used cell culture media without prior sample processing. Throughput rates of several thousand samples per hour may be achieved with high reproducibility under standard laboratory conditions.

Features:

- **Greater Light Output:** Greater assay sensitivity than other leading extended-lifetime firefly luciferase assay reagents.
- **Improved Assay Precision and Reproducibility:** Less sensitive to mixing conditions in multiwell plates. Particularly useful in 384-well plates.
- **Convenience:** Simply mix buffer with lyophilized substrate and add to cells in culture medium; no need to thaw or measure before use.
- **No Sample Preprocessing:** No need to remove culture medium or wash cells prior to adding assay reagent. Grow cells and assay them directly within the same multiwell plate.
- **Easy to Use:** Simply add reagent, which contains a cell lysis component, wait 5 minutes and measure luminescence.
- **Robust:** Compatible with many tissue culture media, including those containing up to 10% serum.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Steady-Glo® Luciferase Assay Substrate at –20°C. Store Steady-Glo® Luciferase Assay Buffer below 25°C.

Bright-Glo™ Luciferase Assay System

Product	Size	Cat.#
Bright-Glo™ Luciferase Assay System	10 ml	E2610
	100 ml	E2620
	10 × 100 ml	E2650

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: High-throughput quantitation of firefly (*Photinus pyralis*) luciferase expression in mammalian cells requires highly sensitive reagents that can adapt to continuous-process robotic systems. Bright-Glo™ Luciferase Assay System is designed specifically to meet the needs of continuous-process systems by providing robust, homogeneous assay chemistry that achieves high assay sensitivity and approximately 30-minute signal half-life without prior sample processing. These attributes also benefit scientists who are using fewer samples but still require high sensitivity and ease of use.

Features:

- **No Sample Preprocessing:** No need to remove culture medium or wash cells prior to adding assay reagent. Grow cells and assay them directly within the same multiwell plate.
- **Increased Sensitivity:** Up to tenfold more light intensity than other homogeneous luciferase assay reagents.
- **Improved Assay Precision and Reproducibility:** Less sensitive to mixing conditions, sample evaporation and pipetting errors.
- **Convenience:** Simply mix buffer with lyophilized substrate and add to cells in culture medium; no need to thaw or measure before use.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store Bright-Glo™ Luciferase Assay Substrate at –20°C. Store Bright-Glo™ Luciferase Assay Buffer below 25°C.

Glo Lysis Buffer, 1X

Product	Size	Cat.#
Glo Lysis Buffer, 1X	100 ml	E2661

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Glo Lysis Buffer (GLB), 1X, is a proprietary formulation developed to promote rapid lysis (within 5 minutes) of cultured mammalian cells without scraping or performing freeze-thaw cycles. It is fully compatible with Bright-Glo™, Steady-Glo®, ONE-Glo™ and *Renilla*-Glo® Luciferase Assay Reagents and the Luciferase Assay Reagent for analysis of firefly luciferase expression. The half-life of these reagents remains the same with or without use of GLB, >5 hours for Steady-Glo® Reagent and >24 minutes for Bright-Glo™ Reagent.

Features:

- **Convenient:** No need for cell scraping or freeze-thaw cycles.
- **Fast:** Cell lysis within 5 minutes.
- **Versatile:** Use with Bright-Glo™, Steady-Glo®, ONE-Glo™ and *Renilla*-Glo® Luciferase Assay Reagents to provide nonhomogeneous assay formats or with other reporter applications.
- **Robust:** Firefly luciferase enzyme in Glo Lysis Buffer is stable at room temperature for at least 48 hours.

Storage Conditions: Store Glo Lysis Buffer at 4°C. For long-term storage, Glo Lysis Buffer can be frozen at –20°C or –70°C.

Available in the Helix® on-site stocking system

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Luciferase Assay System

Product	Size	Cat.#
Luciferase Assay System	100 assays	E1500
Luciferase Assay System with Reporter Lysis Buffer	100 assays	E4030
Luciferase Assay System, 10-Pack	1,000 assays	E1501
Luciferase Assay System Freezer Pack	1,000 assays	E4530
Luciferase 1000 Assay System	1,000 assays	E4550
Luciferase Assay Reagent	100 ml	E1483
Available Separately	**Size**	**Cat.#**
Luciferase Cell Culture Lysis 5X Reagent	30 ml	E1531
Reporter Lysis 5X Buffer	30 ml	E3971

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Luciferase Assay System is an extremely sensitive and rapid reagent for quantitation of firefly luciferase. Linear results are seen over at least eight orders of magnitude of enzyme concentration, and patented technology incorporated in the formulation has allowed for less than 10^{-20} moles of luciferase to be measured under optimal conditions. Generally, 100-fold greater sensitivity can be achieved over the chloramphenicol acetyltransferase (CAT) assay. The Luciferase Assay Reagent generates light that is nearly constant for at least 1 minute and so is compatible with measuring firefly luciferase in a single-tube luminometer or in a multiwell plate luminometer with an auto-injector.

The Luciferase Assay System is a nonhomogeneous assay system; the cells containing the luciferase must be lysed before reagent addition. Glo Lysis Buffer (Cat.# E2661), Cell Culture Lysis Reagent (Cat.# E1531), Passive Lysis Buffer (Cat.# E1941) and Reporter Lysis Buffer (Cat.# E3971) may be used with the Luciferase Assay System for reporter quantitation in mammalian cells. The Luciferase Assay System may also be used for quantitation in plant and bacterial cells, but only Cell Culture Lysis Reagent is suitable for these applications. Reporter Lysis Buffer allows for firefly luciferase, CAT and β-galactosidase assays to be performed from the same cell extract. In some kits the lysis buffer is included, and in others it must be purchased separately (see Component Listing link above).

Features:

- **Linear:** Eight or more orders of magnitude of enzyme concentration.
- **Sensitive:** To 10^{-20} moles of luciferase.
- **Fast:** Perform cell lysis, sample preparation and assays in as little as 5 minutes.
- **Convenient:** Reporter Lysis Buffer allows luciferase, CAT and β-galactosidase assays to be performed from the same cell extract.
- **Simple Assay Procedure:** Eliminates the need for autoinjection devices and rapid mixing protocols when using single-tube luminometers.
- **Versatile:** Luminometer preferred, but not required; adaptable to scintillation counters.
- **Safe:** Non-radioactive.
- **Superior:** High performance compared to competitors' luciferase assays.

Storage Conditions: Store system at –20°C. Store Cat.# E1483 at –70°C. Reporter Lysis Buffer (Cat.# E3971) may be stored at room temperature. Store Cat.# E2661 at 4°C. For long-term storage, Cat.# E2661 can be frozen at –20°C or –70°C.

Beetle Luciferin, Potassium Salt

Product	Size	Cat.#
Beetle Luciferin, Potassium Salt	5 mg	E1601
	1 g	E1605
	50 mg	E1602
	250 mg	E1603

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase genes from the North American firefly (*Photinus pyralis*) and from other beetles are commonly used as reporter genes for studying transcription regulation in transient assay systems and as markers for stably transformed eukaryotic cells. Beetle luciferin (also known as D-luciferin) is synthesized as the monopotassium salt and is a substrate for the beetle luciferase reporter systems. D-luciferin is provided for those researchers who prefer to formulate their own assay reagents for monitoring in vitro or in vivo luciferase activity.

Formula: $C_{11}H_7N_2O_3S_2•K$.

Formula Weight: 318.4 (anhydrous).

Features:

- **Formulation:** Supplied as a potassium salt for easy preparation in aqueous buffer.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –70°C.

Luciferin-EF™ Endotoxin-Free Luciferin Na

Product	Size	Cat.#
Luciferin-EF™	25 mg	E6551
	250 mg	E6552

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin-EF™ is an endotoxin-free beetle luciferin that can be used for cell-based imaging applications in living systems, where endotoxin may create problems. Luciferin-EF™ is tested to ensure endotoxin is below detectable levels and packaged in amber vials with septa to facilitate easy dilution and use.

Features:

- **Achieve Endotoxin Levels Below Detection Limits:** No potential interference in assay due to the presence of endotoxins.
- **Be Assured of Product Integrity:** Luciferin-EF™ is packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments.
- **Appreciate Flexibility and Convenience:** Luciferin-EF™ is available in two sizes, depending on the number of experiments to be performed.

Storage Conditions: Store at –70°C.

Renilla Luciferase Reporter Systems

Renilla-Glo® Luciferase Assay System

Product	Size	Cat.#
Renilla-Glo® Luciferase Assay System	10 ml	E2710
	10 × 100 ml	E2750
	100 ml	E2720

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The *Renilla*-Glo® Luciferase Assay System is a single-addition reagent that generates a glow-type signal with *Renilla* luciferase. When reconstituted, it has the capacity to lyse cells, reduce the autoluminescence of the coelenterazine substrate, and produce a stable signal (i.e., half-life greater than 60 minutes at 22°C).

Features:

- **Simplify Your Assay Optimization:** Add-and-read simplicity for a *Renilla* luciferase reporter system.
- **Improve Assay Precision:** No need for separate lysis and reagent injection steps.
- **Get a Brighter, Longer-Lasting Signal:** Extended bright light output is optimized for batch and continuous-process handling.
- **Reduced Autoluminescence:** Low background formulation offers increased sensitivity.

Storage Conditions: Store at –20°C.

Renilla Luciferase Assay System

Product	Size	Cat.#
Renilla Luciferase Assay System	100 assays	E2810
	1,000 assays	E2820

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: *Renilla* Luciferase Assay System is designed to provide a fast and sensitive method of detecting the luciferase from sea pansy (*Renilla reniformis*). The system is a convenient alternative to firefly (*Photinus pyralis*) reporter systems and is designed to yield reliable, linear results for a concentration range over 7 orders of magnitude. The *Renilla* Luciferase Assay System has been formulated with a proprietary composition that significantly reduces the effect of coelenterazine autoluminescence when compared to other reagents, making the reagent orders of magnitude more sensitive than published methods. This system enables measurements with wildtype and the synthetic *hRluc* genes for primary expression or internal normalization measurements of gene expression.

Features:

- **Reduced Autoluminescence:** Low background, increased sensitivity.
- **Sensitive:** 10^{-19} moles of *Renilla* luciferase detectable.
- **Linear:** Linear range extending 7 logs.
- **Unique:** The first independent assay system for *Renilla* luciferase.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store the *Renilla* Luciferase Assay System at –20°C.

EnduRen™ Live Cell Substrate

Product	Size	Cat.#
EnduRen™ Live Cell Substrate	0.34 mg	E6481
	3.4 mg	E6482
	34 mg	E6485

For Research Use Only. Not for Use in Diagnostic Procedures.

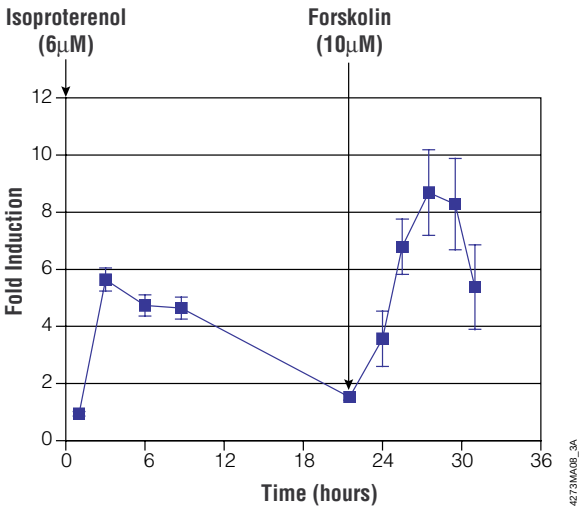
Description: EnduRen™ Live Cell Substrate provides new capabilities in performing luminescent reporter assays by enabling live cell kinetic measurements, streamlining assay development and multiplexing with other lytic assays. EnduRen™ Live Cell Substrate provides the ability to measure *Renilla* luciferase luminescence for at least 24 hours after substrate addition, with up to tenfold higher signal-to-background ratios than wildtype coelenterazines.

EnduRen™ Live Cell Substrate is a uniquely engineered coelenterazine with protected oxidation sites, which minimizes substrate degradation and autoluminescence (background) in cell culture, while it extends the luminescent signal to accommodate microplates without the need for auto-injectors. The result is that EnduRen™ Live Cell Substrate overcomes the key limitations of wildtype coelenterazines by providing an automation-friendly, highly sensitive substrate for *Renilla* luciferase-based gene reporter and BRET applications.

Features:

- **Live Cell Assay:** Generate kinetic profiles for reporter gene, BRET and RNAi applications.
- **Kinetic Reporter Gene Analysis:** Conserve test compounds as you create response profiles in real time to generate more data-rich results.
- **Streamlined Assay Development and Screening:** Rapidly obtain optimal assay parameters through repeat measurements using only a single cell population. Increase your sample throughput using microplates without time-consuming per-sample reagent injection steps.
- **Designed for Multiplexing:** Perform more dynamic experiments using the same sample set by pairing with any lytic assay.
- **High Signal-to-Background Ratios:** Reliably quantitate low levels of expression for reporter gene detection and BRET.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.



Real-Time live cell reporter assay using the EnduRen™ Substrate. Luminescence was monitored from HEK 293 cells for >24 hours, permitting measurement of the effects of sequential treatment of the cells with isoproterenol and forskolin.

Available in the Helix® on-site stocking system

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ViviRen™ Live Cell Substrate

Product	Size	Cat.#
ViviRen™ Live Cell Substrate	0.37 mg	E6491
	3.7 mg	E6492
	37 mg	E6495

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ViviRen™ Live Cell Substrate is a uniquely engineered coelenterazine that generates three- to fivefold brighter *Renilla* luciferase luminescence than wildtype coelenterazine. Using live cells, achieve up to 100-fold higher signal-to-noise ratios for super-sensitive quantitation of reporter gene, BRET and RNAi activity.

Cat.# E6491 is supplied as a liquid, 60mM in DMSO. Cat.# E6492 and E6495 are supplied as a lyophilized solid.

Features:

- **Three- to Fivefold Brighter *Renilla* Luminescence than Coelenterazine:** Quantitate with confidence using miniaturized formats, low-level expression and CCD imagers.
- **Low Autoluminescence:** Achieve unparalleled sensitivity with up to 100-fold higher signal-to-noise ratios than coelenterazine.
- **Live Cell Assay:** Generate kinetic profiles for reporter gene, BRET and RNAi applications.
- **Multiplex Options:** Improve accuracy and precision by combining with CellTiter-Glo® and other lytic assays.

Storage Conditions: Store Cat.# E6491 at –70°C. Store Cat.# E6492 and E6495 at –20°C.

Coelenterazines

Product	Size	Cat.#
Coelenterazine	250 µg	S2001
Coelenterazine-h	250 µg	S2011

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferases from *Renilla*, *Aequorea* and other marine organisms are commonly used as indicators or reporters for studying cellular phenomena in expression assays in eukaryotic cells. *Renilla* luciferase is often used as a reporter of transcription regulation, whereas apoaequorin is often used as a calcium indicator. Other uses of coelenterazines include chemiluminescent detection of Reactive Oxygen Species (ROS) in cells or tissues. Promega offers the following coelenterazine analogs.

Coelenterazine (native) is the luminescent substrate for *Renilla* luciferase and apoaequorin. **Formula:** $C_{26}H_{21}N_3O_3$. **Formula Weight:** 423.5. **Form:** Film.

Coelenterazine-h imparts a luminescent intensity with its aequorin complex that is reported to be 10–20 times higher than that of native coelenterazine, making this derivative a useful tool for measuring small changes in Ca^{2+} concentrations. **Formula:** $C_{26}H_{21}N_3O_2$. **Formula Weight:** 407.5. **Form:** Film.

Features:

- **Highly Pure:** 95%.
- **Custom Capabilities:** Custom packaging and sizes available.
- **Easy to Prepare:** Supplied as a dried substrate for easy preparation in methanol or ethanol.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.

β-Galactosidase Reporter Systems

β-Galactosidase Enzyme Assay System with Reporter Lysis Buffer

Product	Size	Cat.#
β-Galactosidase Enzyme Assay System with Reporter Lysis Buffer	10 ml	E2000
Available Separately	**Size**	**Cat.#**
Reporter Lysis 5X Buffer	30 ml	E3971

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The β-Galactosidase Enzyme Assay System with Reporter Lysis Buffer is a convenient method for assaying β-galactosidase activity in lysates prepared from cells transfected with β-galactosidase reporter vectors such as the pSV-β-Galactosidase Control Vector.

The standard assay is performed by adding a dilute sample to an equal volume of Assay 2X Buffer that contains the substrate ONPG (*o*-nitrophenyl-β-D-galactopyranoside). Samples are incubated for at least 30 minutes, during which time the β-Galactosidase hydrolyzes the colorless substrate to *o*-nitrophenyl, which is yellow. The reaction may be terminated by addition of sodium carbonate, and the absorbance at 420nm is measured by spectrophotometry.

Features:

- **Safe:** Non-isotopic assay.
- **Versatile:** The assay can be used in a 96-well plate format.
- **Flexible:** Reporter Lysis Buffer allows firefly luciferase, CAT and β-galactosidase assays to be performed from the same cell extract.

Storage Conditions: Reporter Lysis Buffer may be stored at room temperature. Store other system components at –20°C.

Beta-Glo® Assay System

Product	Size	Cat.#
Beta-Glo® Assay System	10 ml	E4720
	100 ml	E4740
	10 × 100 ml	E4780

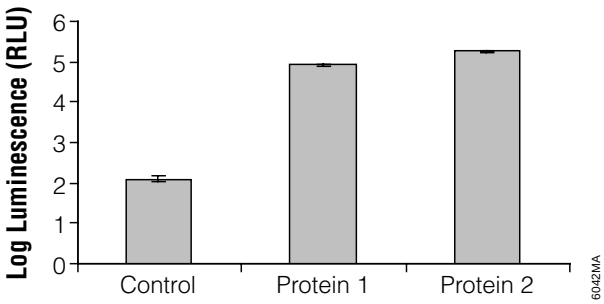
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Beta-Glo® Assay System is a homogeneous method of quantitating β-galactosidase expression in mammalian cells. The system provides a bright luminescent signal that is stable over several hours in commonly used cell culture medium without prior sample processing. The homogeneous assay procedure involves the addition of a single reagent directly to cells cultured in serum-supplemented medium. Throughput rates of several thousand samples per hour may be achieved with high reproducibility under standard laboratory conditions.

Features:

- **Bright Luminescent Signal:** Quantitate with confidence using low-volume formats or in samples with low-level expression.
- **Homogeneous Format:** Perform fewer steps. Add a single reagent directly to cells in growth medium.
- **Stable Signal:** Obtain flexibility and convenience when processing multiple plates.
- **Convenient:** Achieve optimal assay performance at room temperature.
- **Flexible:** Read the luminescent signal using any luminometer. Injectors are not required.
- **Choose Your Configuration:** Learn more about our custom options for this product at: **www.promega.com/custom/**

Storage Conditions: Store at –20°C.



Beta-galactosidase activity determined using the Beta-Glo® Assay System with a yeast two-hybrid system. Image kindly provided by Dr. Brad Hook, Ph.D., University of Wisconsin, Madison.

CAT Reporter Systems

CAT Enzyme Assay System

Product	Size	Cat.#
CAT Enzyme Assay System	50 reactions	E1000
Available Separately	**Size Conc.**	**Cat.#**
Chloramphenicol Acetyltransferase	100 u 10–14 u/µl	E1051
n-Butyryl CoA	255 µl 5 mg/ml	E1061
Reporter Lysis 5X Buffer	30 ml	E3971

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Description: The CAT Enzyme Assay System offers two alternative methods for monitoring CAT enzyme activity in transfected cells: liquid scintillation counting (LSC) and thin layer chromatography (TLC). Either the LSC or TLC assays can be performed using the same cell extract. The TLC-based assay is less sensitive and more time-consuming to perform than the LSC assay but is useful as a visual confirmation of assay results. The resolved TLC reaction products are detected by autoradiography or phosphorimaging analysis.

Chloramphenicol Acetyltransferase (CAT), encoded by a bacterial drug-resistance gene, catalyzes the transfer of an acetyl group from acetyl-CoA to the 3´-hydroxy position of chloramphenicol. The enzyme is suitable as a standard in CAT assays of crude cell extracts. One unit is defined as the amount of enzyme required to transfer 1nmol of butyrate or acetate to chloramphenicol in one minute at 37°C.

n-Butyryl CoA is suitable for use in the chloramphenicol acetyltransferase (CAT) reaction. Transfer of the n-butyryl moiety to chloramphenicol by the CAT enzyme allows enzyme activity to be monitored using liquid scintillation counting or thin layer chromatography formats.

Features:

- **Fast:** The assay is performed in as little as 2–3 hours.
- **Linear:** The LSC assay is linear for three orders of magnitude of enzyme activity.
- **Sensitive:** As little as 3×10^{-4} units (2pg) of CAT can be detected.
- **Robust:** Reporter Lysis Buffer allows luciferase, CAT and β-galactosidase assays to be performed from the same cell extract.

Storage Conditions: Reporter Lysis 5X Buffer may be stored at room temperature. Store other system components at –20°C.

Available in the Helix® on-site stocking system

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Reporter Vectors and Cell Lines

NanoLuc® Luciferase Technology

Product	Size	Cat.#
pNL1.1[*Nluc*] Vector	20 µg	N1001
pNL1.2[*NlucP*] Vector	20 µg	N1011
pNL1.3[*secNluc*] Vector	20 µg	N1021
pNL3.1[*Nluc*/minP] Vector	20 µg	N1031
pNL3.2[*NlucP*/minP] Vector	20 µg	N1041
pNL3.3[*secNluc*/minP] Vector	20 µg	N1051
pNL2.1[*Nluc*/Hygro] Vector	20 µg	N1061
pNL2.2[*NlucP*/Hygro] Vector	20 µg	N1071
pNL2.3[*secNluc*/Hygro] Vector	20 µg	N1081
pNL1.1.CMV[*Nluc*/CMV] Vector	20 µg	N1091
pNL1.3.CMV[*secNluc*/CMV] Vector	20 µg	N1101
pNL3.2.NF-κB-RE[*NlucP*/NF-κB-RE/Hygro]	20 µg	N1111

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: NanoLuc® (Nluc) luciferase is a small enzyme (19.1kDa) engineered for optimal performance as a luminescent reporter. The enzyme is about 100-fold brighter than either firefly (*Photinus pyralis*) or *Renilla reniformis* luciferase using a novel substrate, furimazine, to produce high intensity, glow-type luminescence. The luminescent reaction is ATP-independent and designed to suppress background luminescence for maximal assay sensitivity.

For use as a genetic reporter, multiple forms of NanoLuc® luciferase have been configured to meet differing experimental objectives. Unfused Nluc offers maximal light output and sensitivity, NanoLuc®-PEST (NlucP) closely couples protein expression to changes in transcriptional activity and increased signal-to background ratios, and NanoLuc® luciferase fused to an N-terminal secretion signal (secNluc) is suitable when a secreted reporter is preferred. Luminescence is linearly proportional to the amount of NanoLuc® protein over a 1,000,000-fold concentration range, with a signal half-life ≥2 hours when detected with Nano-Glo® Luciferase Assay Reagent.

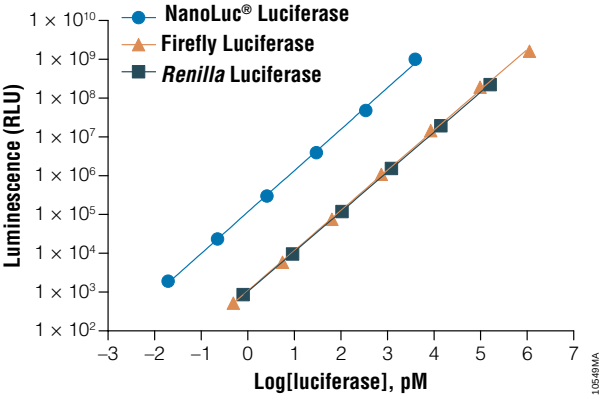
NanoLuc® luciferase possesses a number of physical properties that make it an excellent reporter protein:

- very small, monomeric enzyme (171 amino acids; 513bp)
- high thermal stability (T_m = 60°C)
- active over a broad pH range (pH 6–8)
- no post-translational modifications or disulfide bonds
- uniform distribution in cells
- emission spectrum well suited for bioluminescence resonance energy transfer (BRET; λmax = 465nM).

NanoLuc® Luciferase is made available in a variety of plasmids designed for use in reporter gene assays of transcriptional control and with each of the NanoLuc® forms (unfused Nluc, PEST destabilized NlucP, and secreted secNluc). The different pNL variations are designed for the following:

- pNL1: cloning of a known or putative promoter region
- pNL2: cloning of a known or putative promoter region and establishment of a stable cell line through Hygromycin selection
- pNL3: cloning of a binding site or response element not in need of a basic promoter (such as are present in the pNL3.2.NF-κB-RE vector)
- Control plasmids for the unfused and secreted Nluc forms also are available. The pNL vectors series use a pGL4-based backbone for easy sequence transfer from existing plasmids. This backbone design also reduces anomalous results by removing many transcription factor binding sites and other potential regulatory elements. The Nluc gene variations are codon optimized and have had many potential regulatory elements or other undesirable features removed (such as common restriction enzyme sites).

Storage Conditions: Store at –20°C.



A comparison of the sensitivity of NanoLuc®, firefly and *Renilla* luciferase assays.

Promoter-Driven Control Firefly and *Renilla* Luciferase Vectors

Product	Size	Cat.#
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320
pGL4.13[*luc2*/SV40] Vector	20 µg	E6681
pGL4.73[*hRluc*/SV40] Vector	20 µg	E6911
pGL4.74[*hRluc*/TK] Vector	20 µg	E6921
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.75[*hRluc*/CMV] Vector	20 µg	E6931

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Description: The Promoter-driven *Renilla* control vectors are commonly co-transfected with experimental firefly luciferase vectors for use in the Dual-Luciferase® or Dual-Glo® Reporter Assay Systems. The control *Renilla* vectors should give an almost invariant level of activity, while the experimental firefly vector varies with treatment. The promoter-driven pGL4.13 firefly vector can be used in situations where the experimental vector is designed in a *Renilla* vector. The pGL4.50 and pGL4.51 are useful for tagging a cell line and offer a selectable marker for creating stable transfectants. The pGL4.50 and pGL4.51 vectors are ideal for tagging cell lines for use in in vivo bioluminescent imaging applications.

Features:

Improved Sensitivity and Biological Relevance Due to:

- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology available using destabilized luciferase genes.

Additional Advantages Include:

- **Flexible Detection Options:** Choice of either synthetic *luc2* (*Photinus pyralis*) or *hRluc* (*Renilla reniformis*) reporter genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.
- **Easy Transfer from Vector to Vector:** Common multiple cloning site and a unique SfiI transfer scheme.

Storage Conditions: Store at –20°C.

Promoterless Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.10[*luc2*] Vector	20 µg	E6651
pGL4.11[*luc2P*] Vector	20 µg	E6661
pGL4.12[*luc2CP*] Vector	20 µg	E6671
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.14[*luc2*/Hygro] Vector	20 µg	E6691
pGL4.15[*luc2P*/Hygro] Vector	20 µg	E6701
pGL4.16[*luc2CP*/Hygro] Vector	20 µg	E6711
pGL4.17[*luc2*/Neo] Vector	20 µg	E6721
pGL4.18[*luc2P*/Neo] Vector	20 µg	E6731
pGL4.19[*luc2CP*/Neo] Vector	20 µg	E6741
pGL4.20[*luc2*/Puro] Vector	20 µg	E6751
pGL4.21[*luc2P*/Puro] Vector	20 µg	E6761
pGL4.22[*luc2CP*/Puro] Vector	20 µg	E6771

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Description: Promoterless firefly luciferase vectors are designed primarily to accept a putative promoter element for investigation of important regions controlling gene transcription. The promoterless vectors are available with three varieties of engineered firefly luciferase genes: *luc2*, *luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the *luc2* gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The promoterless vectors are available with or without selectable markers (hygromycin, neomycin or puromycin).

Features:

Improved Sensitivity and Biological Relevance Due to:

- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology available using destabilized luciferase genes.

Additional Advantages Include:

- **Flexible Detection Options:** Choice of either synthetic *luc2* (*Photinus pyralis*) or *hRluc* (*Renilla reniformis*) reporter genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.
- **Easy Transfer from Vector to Vector:** Common multiple cloning site and a unique SfiI transfer scheme.

Storage Conditions: Store at –20°C.

Promoterless *Renilla* Luciferase Vectors

Product	Size	Cat.#
pGL4.70[*hRluc*] Vector	20 µg	E6881
pGL4.71[*hRlucP*] Vector	20 µg	E6891
pGL4.72[*hRlucCP*] Vector	20 µg	E6901
pGL4.76[*hRluc*/Hygro] Vector	20 µg	E6941
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.77[*hRlucP*/Hygro] Vector	20 µg	E6951
pGL4.78[*hRlucCP*/Hygro] Vector	20 µg	E6961
pGL4.79[*hRluc*/Neo] Vector	20 µg	E6971
pGL4.80[*hRlucP*/Neo] Vector	20 µg	E6981
pGL4.81[*hRlucCP*/Neo] Vector	20 µg	E6991
pGL4.82[*hRluc*/Puro] Vector	20 µg	E7501
pGL4.83[*hRlucP*/Puro] Vector	20 µg	E7511
pGL4.84[*hRlucCP*/Puro] Vector	20 µg	E7521

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Promoterless *Renilla* luciferase vectors are designed primarily to accept a putative promoter element for investigation of important regions controlling gene transcription. Alternatively, they may be used as promoterless control vectors in a dual-reporter system with a firefly luciferase vector serving as the experimental vector. The promoterless vectors are available with three varieties of engineered firefly luciferase genes: *hRluc*, *hRlucP* or *hRlucCP*. The *hRluc* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *hRlucP* and *hRlucCP* and RapidResponse™ genes are *hRluc* genes appended with degradation sequences to influence the cellular half-life of the *hRluc* gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *hRlucP* gene responds more rapidly than *hRluc2* with moderate signal intensity, and the *hRlucCP* responds more quickly with the lowest signal intensity. The promoterless vectors are available with or without selectable markers (hygromycin, neomycin or puromycin).

Features:

Improved Sensitivity and Biological Relevance Due to:

- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology available using destabilized luciferase genes.

Additional Advantages Include:

- **Flexible Detection Options:** Choice of either synthetic *luc2* (*Photinus pyralis*) or *hRluc* (*Renilla reniformis*) reporter genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.
- **Easy Transfer from Vector to Vector:** Common multiple cloning site and a unique SfiI transfer scheme.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Signaling Pathway Analysis (Minimal Promoter-Driven) Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.37[*luc2P*/ARE/Hygro] Vector	20 µg	E3641
pGL4.38[*luc2P*/p53 RE/Hygro] Vector	20 µg	E3651
pGL4.39[*luc2P*/ATF6 RE/Hygro] Vector	20 µg	E3661
pGL4.40[*luc2P*/MRE/Hygro] Vector	20 µg	E4131
pGL4.41[*luc2P*/HSE/Hygro] Vector	20 µg	E3751
pGL4.42[*luc2P*/HRE/Hygro] Vector	20 µg	E4001
pGL4.43[*luc2P*/XRE/Hygro] Vector	20 µg	E4121
pGL4.44[*luc2P*/AP1 RE/Hygro] Vector	20 µg	E4111
pGL4.45[*luc2P*/ISRE/Hygro] Vector	20 µg	E4141
pGL4.47[*luc2P*/SIE/Hygro] Vector	20 µg	E4041
pGL4.48[*luc2P*/SBE/Hygro] Vector	20 µg	E3671
pGL4.49[*luc2P*/TCF-LEF RE/Hygro] Vector	20 µg	E4611
pGL4.52[*luc2P*/STAT5RE/Hygro] Vector	20 µg	E4651
pGL4.29[*luc2P*/CRE/Hygro] Vector	20 µg	E8471
pGL4.30[*luc2P*/NFAT-RE/Hygro] Vector	20 µg	E8481
pGL4.32[*luc2P*/NF-κB-RE/Hygro] Vector	20 µg	E8491
pGL4.33[*luc2P*/SRE/Hygro] Vector	20 µg	E1340
pGL4.34[*luc2P*/SRF-RE/Hygro] Vector	20 µg	E1350
Available Separately	**Size**	**Cat.#**
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.25[*luc2CP*/minP] Vector	20 µg	E8431
pGL4.26[*luc2*/minP/Hygro] Vector	20 µg	E8441
pGL4.27[*luc2P*/minP/Hygro] Vector	20 µg	E8451
pGL4.28[*luc2CP*/minP/Hygro] Vector	20 µg	E8461
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520

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Description: Creating a cell line with an indicator of a functional signaling pathway is useful for deciphering the components in a signaling pathway. These tools are made by insertion of multiple repeats of a response element upstream of a minimal promoter (minP). Promega has designed vectors that report the activity of a variety of pathways using the optimized *luc2* firefly luciferase gene in the pGL4 backbone. These vectors also have a hygromycin resistance selectable marker, allowing use either in transient transfection experiments or for selection of a stable cell line.

Also available for construction of pathway reporters are minimal promoter (minP) vectors with three varieties of engineered firefly luciferase genes: *luc2, luc2P* or *luc2CP*. The *luc2* gene is engineered to remove most cryptic transcription factor binding sites and improve mammalian expression through codon optimization. The *luc2P* and *luc2CP* and RapidResponse™ genes are *luc2* genes appended with degradation sequences to influence the cellular half-life of the luc2 gene. The RapidResponse™ genes respond more rapidly to stimuli but at the expense of signal intensity. The *luc2P* (1-hour half-life) gene responds more rapidly than *luc2* (3-hour half-life) with moderate signal intensity, and the *luc2CP* (0.4-hour half-life) responds more quickly with the lowest signal intensity. The minP vectors are available with or without selectable markers (hygromycin). To speed research, several predesigned response element vectors are available already assembled in the pGL4.27 Vector. Some of these also are available stable cell lines (GloResponse™ Cell Lines).

Features:

- Pre-designed vectors remove the need to clone and validate an assay.
- **Increased Reporter Gene Expression:** Codon optimization of synthetic genes for mammalian expression.
- **Reduced Background and Risk of Expression Artifacts:** Removal of cryptic DNA regulatory elements and transcription factor binding sites.
- **Improved Temporal Response:** Rapid Response™ technology using destabilized luciferase genes.
- **Easy Transition from Transient to Stable Cells:** Choice of mammalian selectable markers.

Storage Conditions: Store at –20°C.

Nuclear Receptor Pathway Tools

Nuclear Receptor Analysis Luciferase Vectors

Product	Size	Cat.#
pGL4.36[*luc2P*/MMTV/Hygro] Vector	20 µg	E1360
pFN26A (BIND) *hRluc*-neo Flexi® Vector	20 µg	E1380
pBIND-ERα Vector	20 µg	E1390
pBIND-GR Vector	20 µg	E1581
pGL4.35[*luc2P*/9X*GAL4*UAS/Hygro] Vector	20 µg	E1370
GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line	2 vials	E8530

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Description: Nuclear receptor analysis can be performed with traditional means by using a minimal promoter vector with nuclear receptor response elements upstream. Alternatively, you can use viral elements like the mouse mammary tumor virus long terminal repeat promoter to judge androgen or glucocorticoid responses (e.g., pGL4.36). In many cases, study with these methods requires use of a cell line with the appropriate endogenous nuclear receptors, meaning you may need different cell lines for each nuclear receptor study. A method using the principles of the yeast two-hybrid system was adapted for nuclear receptor work. The nuclear receptor ligand binding domain is fused to the GAL4 DNA binding domain and transfected with a firefly luciferase vector containing repeats of the GAL4 upstream activation sequence upstream of a minimal promoter. The ligand binding domain is responsible for ligand binding, homo- or heterodimerization and interactions with co-activator or co-repressors. The one-hybrid method allows you work with any cell line and nuclear receptor you desire.

Features:

- **Robust:** GAL4-based system removes background signals from endogenous receptors.
- **More Sensitive:** Optimized 9X Gal4 gives improved responses, better signal:noise ratio.
- **Adaptable:** Combination *Renilla*/Neomycin marker allows normalization with Dual-Luciferase® Assay or selectable markers for generating stable cell lines, all with one vector.
- **Consistent:** Compare or profile all nuclear receptors with a single experimental system.
- **Faster Results:** Destabilized and optimized *luc2P* luciferase gene allows greater sensitivity and shorter induction times.

Storage Conditions: Store at –20°C.

pmirGLO Dual-Luciferase miRNA Target Expression Vector

Product	Size	Cat.#
pmirGLO Dual-Luciferase miRNA Target Expression Vector	20 µg	E1330

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pmirGLO Vector is designed to quantitatively evaluate microRNA (miRNA) activity by the insertion of miRNA target sites downstream or 3′ of the firefly luciferase gene (*luc2*). Firefly luciferase is the primary reporter gene; reduced firefly luciferase expression indicates the binding of endogenous or introduced miRNAs to the cloned miRNA target sequence. This vector is based on Promega dual-luciferase technology, with firefly luciferase (*luc2*) used as the primary reporter to monitor mRNA regulation and *Renilla* luciferase (*hRluc-neo*) acting as a control reporter for normalization and selection.

Features:

- **Measure miRNA Function:** Reporter activity correlates with miRNA activity.
- **Optimized Reporter Genes:** luc2 luciferase gene provides highest expression.
- **Combination Renilla**/Neomycin Marker: Normalize with Dual-Luciferase® Assay or for stable cell lines, all with one vector.
- **Biologically Relevant Results:** The moderate-strength PGK promoter provides sensitive analysis not possible with strong promoters.

Storage Conditions: Store at –20°C.

Chroma-Luc™ Vectors

Product	Size	Cat.#
pCBR-Basic Vector	20 µg	E1411
pCBR-Control Vector	20 µg	E1421
pCBG68-Basic Vector	20 µg	E1431
pCBG68-Control Vector	20 µg	E1441
pCBG99-Basic Vector	20 µg	E1451
pCBG99-Control Vector	20 µg	E1461

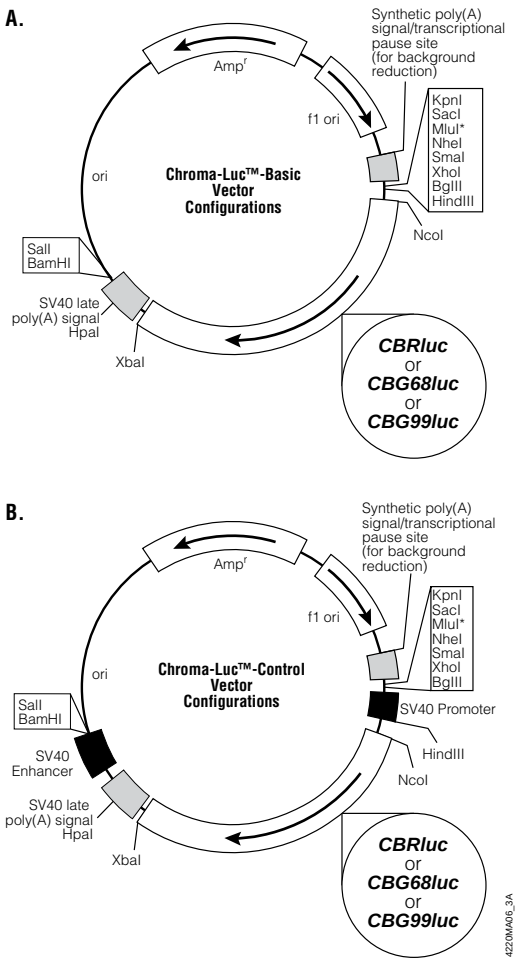
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Chroma-Glo™ Luciferase Assay System and the Chroma-Luc™ Vectors can be used to generate red and green (dual-color) luminescence from a single sample upon addition of a single reagent. The Chroma-Luc™ Vectors consist of 6 plasmids containing synthetic versions of a red or one of two green click beetle luciferase genes; *CBRluc* contains a red-emitting luciferase gene, while *CBG68luc* and *CBG99luc* contain green-emitting luciferase genes. Filtered measurement of the dual-color luminescence produced by the Chroma-Luc™ luciferases permits each reporter to be measured independently and virtually simultaneously. Besides their different luminescence colors, the three Chroma-Luc™ genes differ as follows: *CBG99luc* and *CBRluc* possess 99% DNA and 98% protein homology and are the ideal choice for use when working with transient expression assays; *CBG68luc* and *CBRluc* possess 68.9% DNA homology while retaining a high degree of protein homology (>98%) and thus are the preferred pair for use with stable expression assays. Each of these genes is provided either in a Basic Vector configuration containing a multiple cloning site (MCS) or a Control Vector containing an SV40 promoter and enhancer. The Chroma-Glo™ Assay has a homogeneous format that generates luminescence with >30-minute signal half-lives for each of the Chroma-Luc™ Luciferases, thereby enabling the processing of many plates without prior sample preparation. Two reporter gene measurements can be efficiently and reproducibly determined from each well in a typical high-throughput screen.

Features:

- **Two Reporter Signals by Single Substrate Addition:** Increase your accuracy and precision through normalization, or use both reporters to multiplex experimental measurements. Use filters to spectrally separate the luminescent signals.
- **Ideal Control or Multiplexed Reporter System:** Use the high-homology red and green luciferases to minimize potential RNA and protein effects on reporter expression.
- **Flexible:** Use the Basic Vectors for cloning regulatory elements of interest, or use the Control Vectors as an internal control.
- **High Expression with Minimal Anomalous Transcription Behavior:** Use the synthetic gene design to obtain results easily and reliably.

Storage Conditions: Store at –20°C.



The Chroma-Luc™-Basic and -Control Vectors. These vectors contain *CBRluc* or *CBG68luc* or *CBG99luc*; Amp^r, a gene conferring ampicillin resistance in *E. coli*; ori, origin of plasmid replication in *E. coli*. Arrows within the Chroma-Luc™ and Amp^r genes indicate the direction of functionality.

* MluI should not be used in the vector configuration containing *CBG99luc*, as this gene also contains the MluI site.

Available in the Helix® on-site stocking system

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pRL *Renilla* Luciferase Control Reporter Vectors

Product	Size	Cat.#
pRL-SV40 Vector	20 µg	E2231
pRL-TK Vector	20 µg	E2241
pRL-CMV Vector	20 µg	E2261
pRL-null Vector	20 µg	E2271

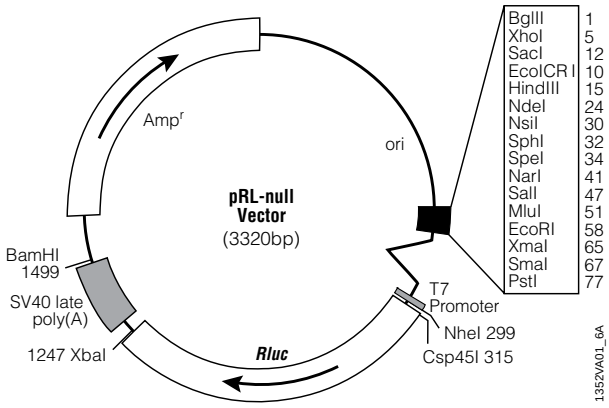
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pRL Vectors are wildtype *Renilla* luciferase (*Rluc*) control reporter vectors. The pRL Vectors, which provide constitutive expression of *Renilla* luciferase, can be used in combination with a firefly luciferase vector to cotransfect mammalian cells. Expression of *Renilla* luciferase provides an internal control value to which expression of the experimental firefly luciferase reporter gene may be normalized. The pRL Vectors contain the cDNA encoding *Renilla* luciferase (*Rluc*) cloned from the anthozoan coelenterate *Renilla reniformis* (sea pansy). Four different promoter configurations are available. The HSV-thymidine kinase promoter (pRL-TK) is relatively weak and may be particularly useful in providing neutral constitutive expression of the *Renilla* luciferase control reporter. The early SV40 enhancer/promoter region (pRL-SV40) and the CMV immediate early enhancer/promoter region (pRL-CMV) typically provide high-level transcription and, therefore, may be less suitable for co-reporter applications involving experimental vectors with robust regulatory elements. In general, we recommend validating the performance of specific co-reporter combinations in the desired target cells. In addition to the modified *Rluc* reporter gene, all pRL Vectors are isolated from a *dam*–/*dcm*– *E. coli* K host strain, allowing digestion with restriction enzymes that are sensitive to *dam* and *dcm* methylation.

Features:

- A T7 promoter is located immediately upstream of *Rluc*, allowing in vitro synthesis of *Renilla* luciferase.
- The SV40 late poly(A) signal sequence is positioned downstream of *Rluc* to provide efficient transcription termination and mRNA polyadenylation.
- A prokaryotic origin of replication and β-lactamase gene allow selected propagation of the pRL vectors in *E. coli* host strains.
- To avoid DNA methylation, all pRL Vectors are isolated from a *dam*–/*dcm*– *E. coli* K host strain.

Storage Conditions: Store vectors at –20°C.



pGL3 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL3-Basic Vector	20 µg	E1751
pGL3-Control Vector	20 µg	E1741
pGL3-Enhancer Vector	20 µg	E1771
pGL3-Promoter Vector	20 µg	E1761

For Research Use Only. Not for Use in Diagnostic Procedures.

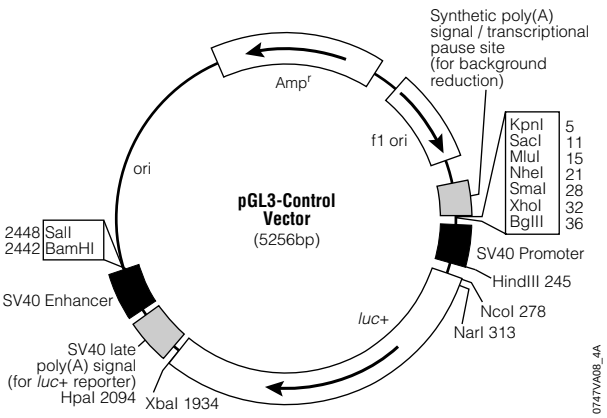
Description: The pGL3 Luciferase Reporter Vectors provide a basis for the quantitative analysis of factors that potentially regulate mammalian gene expression. These may be *cis*- or *trans*-acting factors. The backbone of the pGL2 Luciferase Reporter Vectors was redesigned for the pGL3 Vectors for increased expression, with a modified coding region for firefly (*Photinus pyralis*) luciferase that has been optimized for monitoring transcriptional activity in transfected eukaryotic cells. The assay of this genetic reporter is rapid, sensitive and quantitative. In addition, the Luciferase Reporter Vectors contain numerous features aiding in the structural characterization of the putative regulatory sequences under investigation.

For the most advanced reporter vectors and widest selection of features, please see the pGL4 Luciferase Reporter Vectors.

Features:

- **Easy to Use:** NcoI site located at 5′ end of *luc*+ gene allows creation of fusions with reporter gene using a unique NcoI site.
- **Flexible:** Placement of SmaI site in the MCS allows blunt-ended inserts to be ligated into the MCS and restricted on either side by other restriction endonucleases.
- **Versatile:** XbaI site just downstream of *luc*+ gene facilitates insertions into the 3′ untranslated region of mRNA or subcloning of the luciferase gene.

Storage Conditions: Store vectors at –20°C.



pGL2 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL2-Basic Vector	20 µg	E1641
pGL2-Control Vector	20 µg	E1611
pGL2-Enhancer Vector	20 µg	E1621
pGL2-Promoter Vector	20 µg	E1631

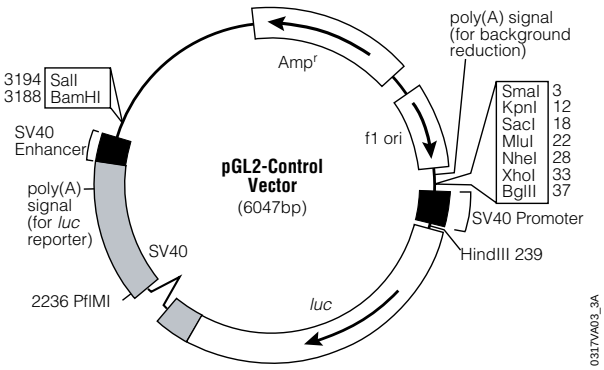
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGL2 Luciferase Reporter Vectors provide a basis for the quantitative analysis of factors that potentially regulate mammalian gene expression. These factors may be *cis*-acting, such as promoters and enhancers, or *trans*-acting, such as various DNA-binding factors. The pGL2 Vectors carry the coding region for firefly (*Photinus pyralis*) luciferase, which is used to monitor transcriptional activity in transfected eukaryotic cells. The assay of this genetic reporter is rapid, sensitive and quantitative. In addition, the pGL2 Vectors contain numerous features that aid in the characterization and mutagenesis of the putative regulatory sequences.

Features:

- **Versatile:** Deletions and site-directed mutations can be made directly to inserted DNAs without subcloning.
- **Convenient:** All vectors contain the firefly luciferase reporter gene, which enables sensitive and rapid quantitation of reporter activity.
- **Low Background:** Upstream polyadenylation signal minimizes spurious transcription of the reporter gene.

Storage Conditions: Store vector at –20°C. Store bacterial strain at –70°C.



pGEM®-*luc* DNA

Product	Size	Cat.#
pGEM®-*luc* DNA	20 µg	E1541

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM®-*luc* Vector is a cassette vector designed as a source of the *luc* gene encoding firefly luciferase, which is found in the pGL2 Vectors. The plasmid is not intended for the expression of luciferase in eukaryotic or prokaryotic cells.

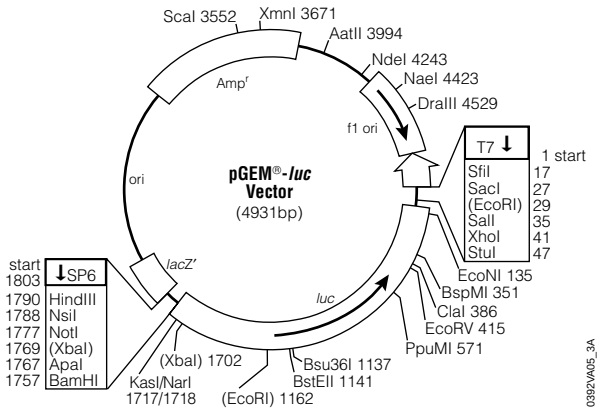
The pGEM®-*luc* Vector was constructed by positioning the luciferase gene (*luc*) in the center of the multiple cloning region of the pGEM®-11Zf(–) Vector, providing a number of unique restriction sites at both ends of the gene. Sites that are surrounded by parentheses are not unique, as additional sites for each also exist in the luciferase gene. Note also that using HindIII or NsiI to clone the luciferase gene will include upstream ATG codons, which may reduce the efficiency of expression in eukaryotes. The luciferase cassette does not contain the prokaryotic Shine-Delgarno sequence for bacterial expression.

The pGEM®-*luc* Vector is supplied with a glycerol stock of bacterial strain JM109.

Features:

- **Flexibility:** Provides a luciferase cassette with several unique cloning sites at both ends for analysis of transcriptional activity, mRNA processing, protein structure/function, or labeling of cells and viruses.

Storage Conditions: Store at –20°C. Store bacterial strain at –70°C.



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GloResponse™ Luciferase Reporter Cell Lines

Product	Size	Cat.#
GloResponse™ CRE-*luc2P* HEK293 Cell Line	2 vials	E8500
GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line	2 vials	E8510
GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line	2 vials	E8520
GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line	2 vials	E8530

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GloResponse™ Luciferase Reporter Cell Lines contain optimized, state-of-the-art luciferase reporter technology integrated into a cell line. This allows the rapid development of a reporter assay based on the pathway of interest regulating the luciferase gene. Assays configured using the GloResponse™ Cell Lines are amenable for high-throughput screening. These assays typically have greater response dynamics (fold of induction) than other assay formats and good quality as indicated by the high Z´ values. GloResponse™ Cell Lines were developed to study a variety of signaling pathways. Activators of these pathways may be native to the HEK293 cell line. Activity of non-native activators can be studied after they have been introduced by transfection.

GPCRs regulate a wide-range of biological functions and are one of the most important target classes for drug discovery. GPCR signaling pathways can be categorized into three classes based on the G protein α-subunit involved: Gs, Gi/o and Gq. The GloResponse™ CRE-*luc2P* HEK293 Cell Line can be used to study and configure screening assays for Gs- and Gi/o-coupled GPCRs, which signal through cAMP and the cAMP Response Element (CRE). For Gq-coupled GPCRs, which signal through calcium ion release and activate the Nuclear Factor of Activated T-Cells response element (NFAT-RE), the GloResponse™ NFAT-RE-*luc2P* HEK293 Cell Line should be used.

NF-κB-REs are the DNA binding sequences for the NF-κB transcription factor complex, which is responsible for regulating inflammation, immune response, cell growth and apoptosis. The GloResponse™ NF-κB-RE-*luc2P* HEK293 Cell Line is designed for rapid and convenient analysis of any cellular response that results in modulation of NF-κB activities.

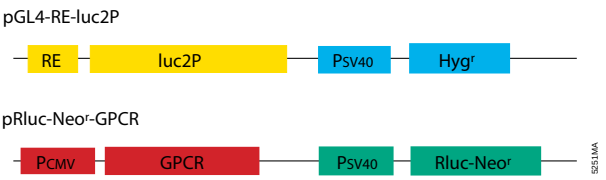
The GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line contains nine repeats of GAL4 UAS (Upstream Activator Sequence) driving the transcription of the luciferase reporter gene *luc2P* in response to binding of a fusion protein containing the GAL4 DNA Binding Domain, such as the Estrogen Receptor Ligand Binding Domain in pBIND-ERα Vector (Cat.# E1390) when activated by a ligand. This makes the cell line suitable for the study of nuclear receptors or can be used to study other types of protein:protein and protein:DNA interactions. The GAL4 DNA Binding Domain partner must be introduced to this cell line by transfection or other similar techniques.

The GloResponse™ Cell Lines were generated by clonal selection of HEK293 cells stably transfected with pGL4-based vectors carrying specific response elements for the pathway of interest. These cell lines incorporate the improvements developed for the pGL4 family of reporter vectors for enhanced performance. The destabilized *luc2P* luciferase reporter is used for improved responsiveness to transcriptional dynamics. The *luc2P* gene is codon optimized for enhanced expression in mammalian cells, and the pGL4 plasmid backbone was engineered to reduce background reporter expression. The result is a cell line with very high induction levels when the pathway of interest is activated.

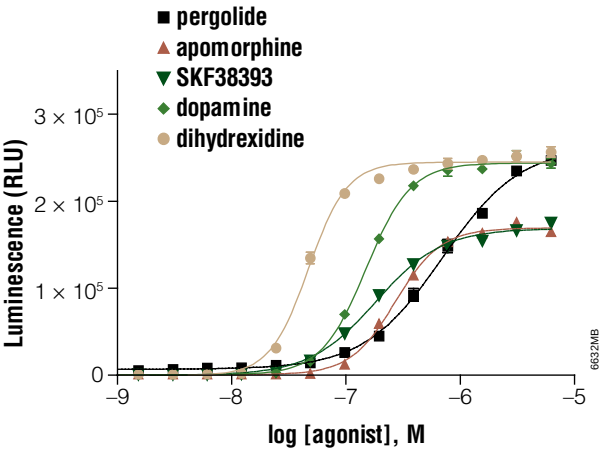
Features:

- **Convenient:** Prebuilt, optimized luciferase reporter cell lines.
- **Robust:** Large assay window provided by high levels of induction and low background expression.
- **Faster Results:** Improved responsiveness to transcriptional dynamics with destabilized luciferase.

Storage Conditions: Place frozen cells in storage at less than or equal to –140°C (mechanical deep freeze or vapor phase liquid nitrogen) until you are ready to thaw and propagate them. We strongly recommend that the cells are propagated, using the provided procedure, as soon as possible. This will ensure the optimal cell viability and assay performance.



Two plasmids involved in the dual-luciferase GPCR assay. RE, response element/promoter; *luc2P*, destabilized firefly luciferase with PEST sequence; P_{SV40}, SV40 promoter; Hygr, hygromycin resistance gene; P_{CMV}, CMV promoter; *Rluc*-neor, *Renilla* luciferase and neomycin resistance gene fusion. PEST sequences are associated with rapidly degraded proteins.



Ranking compound potency and detection of DRD1 partial agonists. A GloResponse™ CRE-*luc2P* clone stably expressing dopamine receptor D1 was plated at 10,000 cells/well in a 96-well plate. Each agonist was serially diluted 1:2, then added to wells in replicates of four, beginning with 50µM. Cells were incubated with agonist for four hours, harvested and analyzed using the Dual-Glo™ Luciferase Assay System (Cat.# E2920). Luciferase activity was measured on the GloMax® 96 Microplate Luminometer (Cat.# E6501).

Reporter Vector Sequencing Primers

Product	Size	Cat.#
RVprimer3 (clockwise)	2 µg	E4481
RVprimer4 (counterclockwise)	2 µg	E4491

For Research Use Only. Not for Use in Diagnostic Procedures.

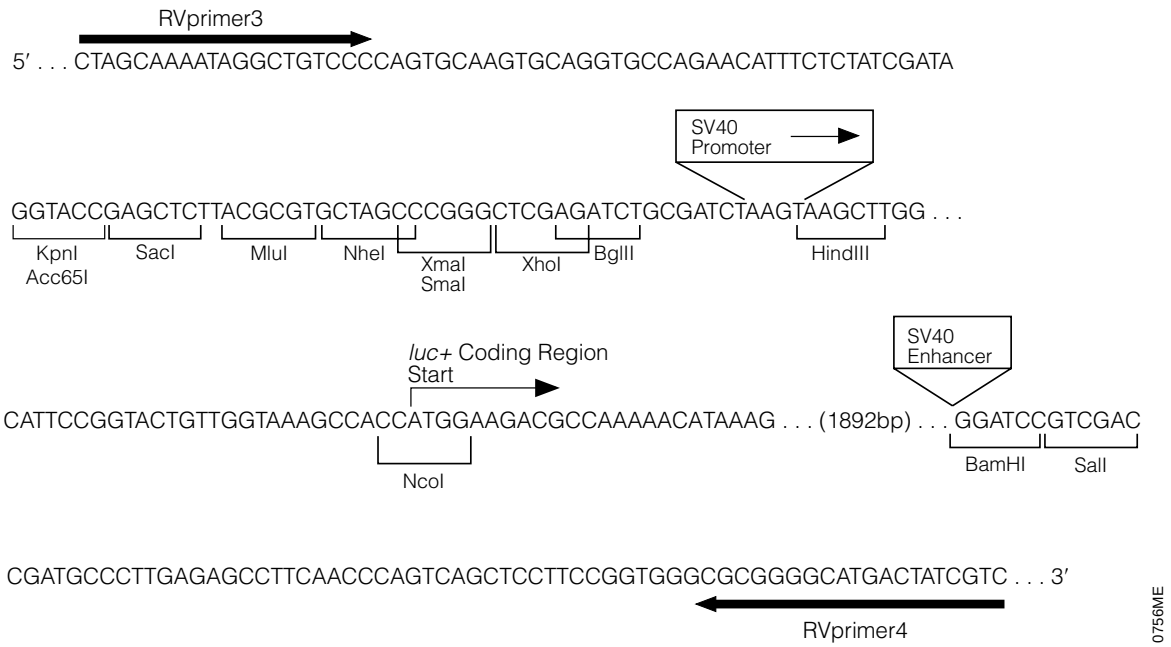
Description: The Reporter Vector (RV) Sequencing Primers are designed for use with the pGL3 and pGL4 Luciferase Vectors, Chroma-Luc™ Vectors and pCAT™3 Reporter Vectors. RVprimer3 binds upstream of the *luc+*, *luc2* or CAT gene, and sequencing runs clockwise across the multiple cloning region.

RVprimer4 binds downstream of the *luc+*, *luc2* or CAT polyadenylation region in the Promoter and Basic Vectors and downstream of the SV40 enhancer region of the Enhancer and Control Vectors. Both primers can be used for sequencing double-stranded templates, but only RVprimer4 can be used for sequencing single-stranded templates.

Primer Sequences

- RVprimer3: 5′-d(CTAGCAAAATAGGCTGTCCC)-3′
- RVprimer4: 5′-d(GACGATAGTCATGCCCCGCG)-3′

Storage Conditions: Store at –20°C. The primers are supplied dried.



pGL3 Vector multiple cloning region showing the upstream and downstream cloning sites and the locations of the sequencing primers, RVprimer3 and RVprimer4. The arrows above the primers indicate the direction of sequencing. The positions of the promoter (in pGL3-Promoter and pGL3-Control) and the enhancer (in pGL3-Enhancer and pGL3-Control) are shown as insertions into the sequence of pGL3-Basic (note that the promoter replaces four bases of pGL3-Basic). The sequence shown is of the ssDNA produced using the f1 origin.

Reporter Vector Sequencing Primer Information.

	RVprimer3 Sequences from upstream of multiple cloning region into multiple cloning region.	RVprimer4 Sequences from downstream of reporter ORF and polyadenylation sequences into SalI, BamHI multiple cloning region, which is intended for cloning enhancer elements.
pGL3 Vectors	✓	✓
pCAT®3 Vectors	✓	✓
Chroma-Luc™ (Click Beetle) Vectors (pCBR, pCBG68, pCBG99)	✓	✓
pGL4 Vectors	✓	✓

9490LA

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pSP-*luc*+NF Fusion Vector

Product	Size	Cat.#
pSP-*luc*+NF Fusion Vector	20 µg	E4471

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSP-*luc*+NF Fusion Vector is a luciferase cassette vector containing the engineered firefly luciferase gene, *luc*+NF. The *luc*+NF gene is related to the *luc*+ gene found in the pGL3 family of eukaryotic reporter vectors but has been further modified for maximum flexibility in constructing N-terminal fusions (NF) with luciferase. Subcloning *luc*+NF into expression vectors provides a useful genetic reporter with exceptional sensitivity. The pSP-*luc*+NF Fusion Vector is not itself intended for the expression of luciferase in eukaryotic cells, because it does not contain eukaryotic promoters, enhancers or polyadenylation signals.

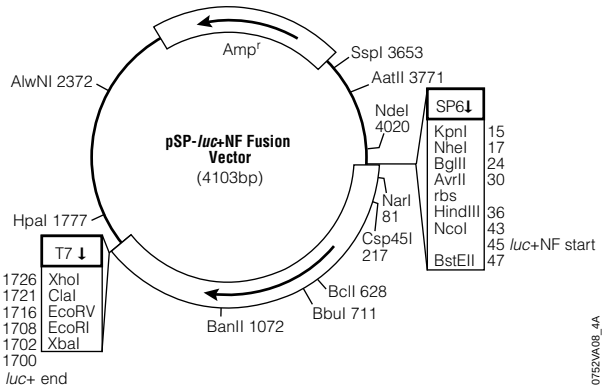
A unique BstEII site has been inserted immediately downstream of the luciferase ATG translation codon, allowing cloned inserts to be positioned immediately downstream of the *luc*+NF initiation codon. This vector is recommended specifically for applications where N-terminal fusion proteins do not contain an internal ATG codon at the luciferase junction.

The *luc*+NF gene is positioned downstream of an SP6 promoter and a ribosome binding site. An opposing T7 promoter is located immediately downstream of *luc*+NF. Thus, the pSP-*luc*+NF Fusion Vector provides a convenient template for the in vitro synthesis of both sense and antisense luciferase transcripts for studies involving in situ hybridization, RNA processing, RNA transfection or coupled in vitro transcription/translation and protein folding. Multiple cloning regions containing recognition sequences for commonly used restriction enzymes are positioned at the 5′ and 3′ ends of *luc*+NF to provide maximum flexibility in cloning. Luciferase enzymatic activity can be assayed most efficiently using one of the Luciferase Assay Systems.

Features:

- **Flexibility:** Multiple cloning regions are positioned at the 5′ and 3′ ends of *luc* to provide maximum flexibility in cloning.
- **N-Terminal Fusions with Luciferase:** Unique BstEII site located immediately downstream of the luciferase ATG translation codon.

Storage Conditions: Store at –20°C.



pSV-β-Galactosidase Control Vector

Product	Size	Cat.#
pSV-β-Galactosidase Control Vector	20 µg	E1081

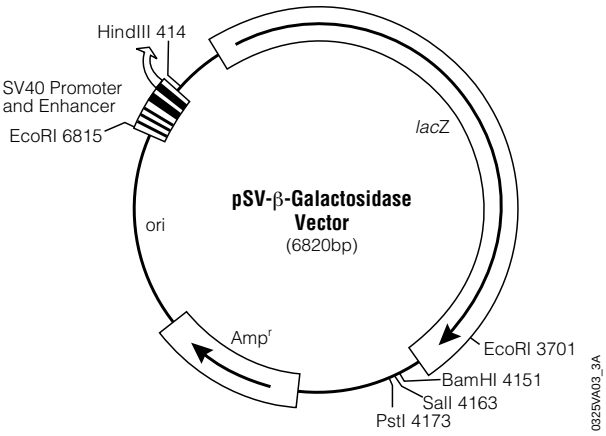
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSV-β-Galactosidase Control Vector is a positive control vector for monitoring transfection efficiencies of mammalian cells. The SV40 early promoter and enhancer drive transcription of the *lac*Z gene, which encodes the β-galactosidase enzyme. The pSV-β-Galactosidase Control Vector can be transfected individually or co-transfected with your DNA of interest. β-galactosidase is an excellent reporter enzyme that can be assayed quickly and directly in cell extracts using spectrophotometric, fluorescent or chemiluminescent assays. This reporter enzyme is also widely used for in situ histochemical analysis using the substrate X-Gal.

The pSV-β-Galactosidase Control Vector can be co-transfected with your DNA of interest. For example, co-transfection with firefly luciferase gene vectors (pGL3 Vectors) provide cell extracts that can be assayed for both luciferase and β-galactosidase activities. In this manner, the pSV-β-Galactosidase Vector acts as an internal control for transient expression assays. A negative control extract, prepared from mock-transfected cells, should also be assayed for the presence of endogenous β-galactosidase activity in cultured cells. In addition, co-transfection with chloramphenicol acetyltransferase reporter gene vectors (pCAT™3 Vectors) permits assaying for both CAT and β-galactosidase activities.

The pSV-β-Galactosidase Vector is a modification of pRSV-β-Gal with SV40 and pUC18 sequences substituted for RSV and pBR322 sequences. The pSV-β-Galactosidase Vector will express β-galactosidase in *E. coli* due to the presence of the *E. coli* gpt promoter located upstream of the *lac*Z gene. Colonies of *E. coli* containing the pSV-β-Galactosidase Vector will appear blue when plated on media containing X-Gal.

Storage Conditions: Store at –20°C.



pCAT™3 Vectors

Product	Size	Cat.#
pCAT™3-Basic Vector	20 µg	E1871
pCAT™3-Control Vector	20 µg	E1851
pCAT™3-Enhancer Vector	20 µg	E1881
pCAT™3-Promoter Vector	20 µg	E1861

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pCAT™3 Reporter Vectors provide a basis for the quantitative analysis of factors that may regulate mammalian gene expression. The redesigned backbone of the pCAT™3 Reporter Vectors is similar to the pGL3 Luciferase Vectors with the exception of a chimeric intron located 5′ of the chloramphenicol acetyltransferase (CAT) gene. As with the pGL3 Vectors, the pCAT™3 Vectors contain a different polyadenylation site located 3′ of the gene. The redesigned backbone increases expression of the reporter gene, improves in vivo vector stability and provides greater flexibility in performing manipulations.

Features:

- **Efficient:** Optimal translation efficiency.
- **Robust:** Increased expression with more efficient poly(A) signal.
- **Clearer Results:** Reduced background CAT expression.
- **Compatible:** Altered multiple cloning regions make vectors compatible with the pGL3 Vectors.
- **Versatile:** Can produce ssDNA for sequencing and mutagenesis.

Storage Conditions: Store vectors at –20°C.

Monster Green® Fluorescent Protein phMGFP Vector

Product	Size	Cat.#
Monster Green® Fluorescent Protein phMGFP Vector	20 µg	E6421

For Research Use Only. Not for Use in Diagnostic Procedures.

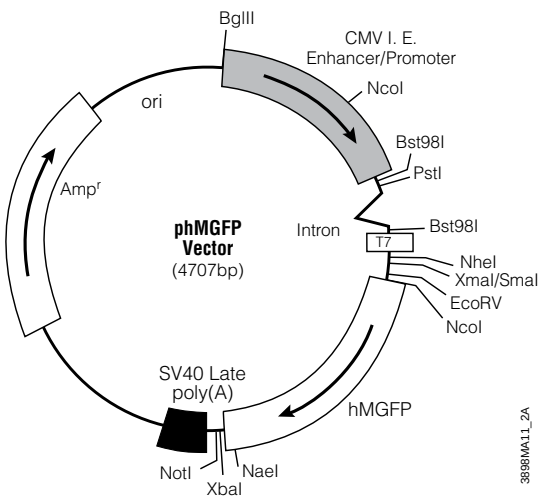
Description: The phMGFP Vector contains the open reading frame for the Monster Green® Fluorescent Protein cloned into a mammalian expression vector. The Monster Green® Fluorescent Protein is encoded by an improved synthetic version of the green fluorescent protein gene originally cloned from *Montastrea cavernosa* (Great Star Coral). The synthetic gene (hMGFP) expresses a 26kDa protein that shows improved fluorescence intensity compared to the native gene. Furthermore, the hMGFP gene has been codon optimized and cleared of most consensus sequence transcription factor binding sites to ensure reliability and high levels of expression.

The Monster Green® Fluorescent Protein encoded by the hMGFP gene is an ideal fluorescent reporter, providing high-level fluorescence and reducing cytotoxicity. Monster Green® Fluorescent Protein generally fluoresces at least 20% brighter than other commercially available green fluorescent proteins (GFPs) and also reduces cytotoxicity, offering flexibility when working with transient and stable expression assays.

Features:

- **Brighter Fluorescence:** Visualize low-level expression in situ using fluorescence microscopy, imagers or FACS®.
- **Reduced Cytotoxicity:** Minimize cellular perturbations when working with transient or stable expression assays.
- **Flexible:** Create fusion proteins for imaging and localization studies using standard FITC detection.
- **High Purity:** Obtain high transfection efficiencies for precloning confirmation studies.

Storage Conditions: Store at –20°C.



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In Vivo Imaging

VivoGlo™ Luciferin, In Vivo Grade

Product	Size	Cat.#
VivoGlo™ Luciferin, In Vivo Grade	50 mg	P1041
	1 g	P1043
	250 mg	P1042

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferase genes from the North American firefly (*Photinus pyralis*) and from other beetles are commonly used as light-emitting reporters in cellular and animal models. VivoGlo™ Luciferin is the potassium salt of D-luciferin, the firefly luciferase substrate capable of generating light when a suitable model is used.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

VivoGlo™ Caspase 3/7 Substrate (Z-DEVD-Aminoluciferin Sodium Salt)

Product	Size	Cat.#
VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt)	50 mg	P1781
	5 × 50 mg	P1782

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt) is a firefly luciferase prosubstrate containing the DEVD tetrapeptide sequence recognized by caspase-3 and -7. Upon activation of caspase-3 or -7, the DEVD peptide is cleaved, and the liberated aminoluciferin reacts with luciferase to generate measurable light. Cleavage has been shown in cells and in vivo systems. For mice, activity of a related salt was demonstrated when 10mg of the substrate in 150µl of saline was injected intraperitoneally. Other references suggest that doses as low as 1.5mg per mouse (50mg/kg) can be used. We recommend conducting a preliminary dose-response study using no more than 500mg/kg.

VivoGlo™ Caspase-3/7 Substrate (Z-DEVD-Aminoluciferin, Sodium Salt) has a minimum solubility of 500mg/ml in PBS, and the resulting solution is stable for at least 3 days at room temperature. Injection is usually done via the intraperitoneal route, and imaging is generally started 10 minutes after injection.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

VivoGlo™ Luciferin-β-Galactosidase Substrate (6-O-β-galactopyranosyl luciferin)

Product	Size	Cat.#
VivoGlo™ Luciferin-β-Galactoside Substrate (6-O-β-galactopyranosyl luciferin)	50 mg	P1061
	250 mg	P1062

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Luciferin-β-galactoside is a substrate for the commonly used reporter enzyme β-galactosidase. The substrate is cleaved by β-galactosidase to form luciferin and galactose. When used in a model system expressing firefly luciferase, the luciferin is then utilized in a firefly luciferase reaction to generate light.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

EnduRen™ In Vivo *Renilla* Luciferase Substrate

Product	Size	Cat.#
EnduRen™ In Vivo *Renilla* Luciferase Substrate	0.34 mg	P1111
	3.4 mg	P1112

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: EnduRen™ in vivo *Renilla* Luciferase Substrate is a uniquely engineered coelenterazine-based compound with protected oxidation sites. These modifications are designed to minimize substrate degradation and autoluminescence. It is reported that EnduRen™ Substrate may have a longer kinetic output when compared to the native coelenterazine substrate when used in an in vivo imaging application in a mouse model.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

ViviRen™ In Vivo Renilla Luciferase Substrate

Product	Size	Cat.#
ViviRen™ In Vivo *Renilla* Luciferase Substrate	0.37 mg	P1231
	3.7 mg	P1232

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: ViviRen™ in vivo *Renilla* Luciferase Substrate is a uniquely engineered coelenterazine-based compound with protected oxidation sites. These modifications are designed to minimize substrate degradation and autoluminescence. It is reported that the ViviRen™ Substrate demonstrates brighter output when compared to the native coelenterazine substrate when used in an in vivo imaging application in a mouse model.

Cat.# P1231 is supplied as a liquid, 60mM in DMSO. Cat.# P1232 is supplied as a lyophilized solid.

VivoGlo™ In Vivo Imaging Substrates are provided in cooperation with Xenogen Corporation and Caliper Life Sciences for use in in vivo bioluminescence imaging applications.

Features:

- **Highest Quality Substrates:** Eliminate potential interference in assays due to the presence of endotoxins.
- **Assured Product Integrity:** Most products are packaged in amber vials with septa to ensure product integrity as well as offer ease of dilution and use for imaging experiments. Product is packaged with fine tolerances to minimize the need to weigh substrates.
- **Flexibility and Convenience:** Available in multiple sizes to accommodate a variety of experimental settings.

Storage Conditions: Store at –20°C.

pGL4 in vivo Imaging Vectors

Product	Size	Cat.#
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGL4 Luciferase Reporter Vectors are the next generation of reporter gene vectors optimized for expression in mammalian cells. Numerous configurations of pGL4 Vectors are available. The pGL4.50 and pGL4.51 Vectors offer the synthetic firefly luciferase luc2 gene under the control of the strong constitutive CMV (cytomegalovirus) promoter. These vectors have demonstrated high expression levels in a variety of cell lines tested. The addition of a selectable marker, either hygromycin or neomycin, also allows the creation of stable cell lines. Cell lines with constant expression of luciferase can be used in animal models to study in vivo changes in cell physiology.

Features:

- Pre-built luciferase expression vector.
- Luc2 luciferase gene provides highest expression.
- Selectable markers for generating stable cell lines.

Storage Conditions: Store at –20°C.

Transfection Reagents

FuGENE® 6 Transfection Reagent

Product	Size	Cat.#
FuGENE® 6 Transfection Reagent	1 ml	E2691
	5 × 1 ml	E2692
	0.5 ml	E2693

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: FuGENE® 6 Transfection Reagent is a nonliposomal formulation designed to transfect plasmid DNA into a wide variety of cell lines with high efficiency and low toxicity. The protocol does not require removal of serum or culture medium and does not require washing or changing of medium after introducing the reagent/DNA complex.

Features:

- **More Biologically Relevant:** Very low toxicity; less impact on biology.
- **Simple Protocol:** No culture changes; less variability; compatible with serum.
- **Effective in Many Cell Types:** Used in thousands of publications.
- **Ideal for Use with Luciferase Assays:** More expression; sensitive results.

Storage Conditions: Store FuGENE® 6 Transfection Reagent at 4°C.Do not freeze or store below 0°C.

Available in the Helix® on-site stocking system

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FuGENE® HD Transfection Reagent

Product	Size	Cat.#
FuGENE® HD Transfection Reagent	1 ml	E2311
	5 × 1 ml	E2312

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: FuGENE® HD Transfection Reagent is a novel, nonliposomal formulation designed to transfect DNA into a wide variety of cell lines with high efficiency and low toxicity. The protocol does not require removal of serum or culture medium and does not require washing or changing of medium after introducing the reagent/DNA complex. Additionally, the FuGENE® HD Transfection Reagent has been shown to support transfection in chemically-defined media and does not contain any animal-derived components.

The cell lines listed in Table 1 have been transfected successfully by Promega Corporation or Fugent, L.L.C. For a list of conditions that were used in the transfection of these and other cell types, visit our FuGENE® HD Protocol Database: **www.promega.com/resources/tools/fugene-hd-protocol-database/**

Features:

- **More Biologically Relevant:** Low toxicity, less impact on biology.
- **Simple Protocol:** No culture changes, less variability, compatible with serum.
- **Effective in Many Cell Types:** Online database with over 40 cell types, including primary and stem cells.
- **Ideal for Use with Luciferase Assays:** More expression, sensitive results.

Storage Conditions: Store FuGENE® HD Transfection Reagent at 4°C. Do not freeze or store below 0°C.

Table 1. Cell Lines Successfully Transfected Using the FuGENE® HD Transfection Reagent by Promega Corporation or Fugent, L.L.C.

NIH3T3	U-937
HEK293	STSAR90
CHO-K1	AGS
CHO-S	BHK-21
SNU-16	Caco-2
A-375	Caki-1
T98G	Capan-1
HeLa	H4
HepG2	Human skeletal muscle myoblasts (HSMM)
High Five™	NCI-N87
MCF7	Panc-1
mES	SK MEL-28
hES	SK-OV-3
PC3	T-24
RAW 264.7	T-84
SCC61	U-87 MG
SQ20B	A549
STO	DMS 53
U-2 OS	T47D
COS-7	Jurkat
293F	Huh7

8684LA

TransFast™ Transfection Reagent

Product	Size	Cat.#
TransFast™ Transfection Reagent	1.2 mg	E2431

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The TransFast™ Transfection Reagent is composed of the synthetic cationic lipid, (+)-N,N [bis (2-hydroxyethyl)]-N-methyl-N-[2,3-di(tetradecanoyloxy) propyl] ammonium iodide and the neutral lipid, DOPE. The TransFast™ Reagent is supplied as a dried lipid film that forms multilamellar vesicles upon hydration with water. Cationic liposomes designed for transfection, such as the TransFast™ Reagent, are more versatile than many other traditional transfection methods. The advantages include flexibility in the macromolecules that are delivered, in vitro and in vivo applications, ability to more reproducibly transfect cells that are recalcitrant to other methods and suitability for transient and stable transfection. Several different types of macromolecules, including RNA and DNA of all sizes ranging from oligonucleotides to plasmids and yeast artificial chromosomes, can be delivered to cells using liposomes. The TransFast™ Transfection Reagent is designed for nucleic acid delivery to eukaryotic cells in vitro and in vivo and performs well with many cell lines. To date, we have found that TransFast™ Reagent performs particularly well for DNA delivery to NIH/3T3, CHO, 293, K562, PC12, Jurkat and insect Sf9 cells.

Features:

- **Fast:** Transfect in 1 hour. Transfection times can be decreased to as little as 30 minutes with certain cell lines.
- **Easy to Use:** Resuspend the reagent in water, freeze, thaw, mix with DNA, and add to cells.
- **Efficient:** High-efficiency transfection—transient and stable—in many cells.
- **Robust:** Requires less optimization than other systems. Allows transfection of cell types such as primary cell cultures that require continuous exposure to serum.

Storage Conditions: Store at –20°C.

ProFection® Mammalian Transfection System

Product	Size	Cat.#
ProFection® Mammalian Transfection System-Calcium Phosphate	40 reactions	E1200

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The introduction of DNA into mammalian cells is facilitated by the ProFection® Mammalian Transfection System. This system offers you a Calcium Phosphate-mediated transfection procedure. Each system contains sufficient reagents for 40 high-efficiency transfections of cells plated in 100mm tissue culture dishes.

Calcium phosphate transfection is an effective method for the production of long-term stable transfectants. This method also works well for transient expression of transfected genes and can be used with most adherent cell lines.

Features:

- **Efficient:** Components optimized for high transfection efficiencies.

Storage Conditions: Store at –20°C.

19 RNA Analysis

Additional products for RNA Analysis can be found in Chapter 7, DNA and RNA Purification, and Chapter 15, PCR.

For Additional Information see:

RNA Purification	**161**
Ribonuclease Inhibitors	**129**
RNA Quantitation	**170**
RT-qPCR	**270**

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

In Vitro Transcription

RiboMAX™ Large Scale RNA Production Systems

Product	Size	Cat.#
RiboMAX™ Large Scale RNA Production System—SP6	1 system	P1280
RiboMAX™ Large Scale RNA Production System—T7	1 system	P1300

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The RiboMAX™ Large Scale RNA Production Systems consistently produce 2–5mg/ml of RNA in a 1ml reaction, about 10- to 20-fold more RNA than is produced with the standard Riboprobe® System transcription reaction. The RiboMAX™ System reactions differ from those of the Riboprobe® Systems in three primary ways: a HEPES (pH 7.5) buffer is used rather than a Tris-HCl (pH 7.9) buffer; rNTP and magnesium concentrations are elevated at levels appropriate for either SP6 or T7 RNA polymerase; and inorganic pyrophosphatase is included in the reaction.

RNAs synthesized with the RiboMAX™ System perform better for in vitro translation in rabbit reticulocyte translation systems than RNA synthesized by standard methods. The reduction of components inhibitory to translation may be advantageous for other applications requiring biologically active RNA. Because the RiboMAX™ Systems produce large quantities of RNA, these systems are not recommended for the generation of high-specific-activity RNA probes.

Note: Use of the RiboMAX™ System for production of capped transcripts requires separate purchase of the Ribo m^7G Cap Analog (Cat. P1711).

Features:

- **Flexible:** Systems are available for use with SP6 and T7 RNA polymerases.
- **Scalable:** Reactions can be scaled up or down to suit varying RNA production requirements.
- **High-Quality:** Synthesis of enhanced, translation-grade RNA.

Storage Conditions: Store at –20°C.

T7 RiboMAX™ Express Large Scale RNA Production System

Product	Size	Cat.#
T7 RiboMAX™ Express Large Scale RNA Production System	1 system	P1320

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The T7 RiboMAX™ Express Large Scale RNA Production System is an in vitro transcription system designed for the consistent production of milligram amounts of RNA in a short amount of time. Due to optimization of the enzyme mix and transcription buffer, yields of 5–8.5mg/ml are generated in 30 minutes, compared to 2–4 hours with other commercially available systems. To minimize pipetting steps and errors, the 2X transcription buffer includes all four rNTPs. In addition, the system includes RQ1 RNase-Free DNase for the removal of plasmid template after transcription.

Due to the combined 2X buffer and rNTPs, the T7 RiboMAX™ Express System is not recommended for the synthesis of RNA for applications that require capped RNA. For synthesis of capped RNA, please order the standard RiboMAX™ Large Scale RNA Production System—T7 (Cat.# P1300).

Features:

- **Fast:** The T7 RiboMAX™ Express System produces milligram amounts of RNA in as little as 30 minutes rather than 2–4 hours as with other commercially available systems.
- **Convenient:** The four rNTPs and 2X transcription buffer have been combined, thus minimizing pipetting errors and setup time.
- **Flexible:** Efficiently transcribes DNA templates of varying sizes. Works with transcripts as short as 21bp.

Storage Conditions: Store at –20°C.

Riboprobe® Systems

Product	Size	Cat.#
Riboprobe® System—SP6	1 system	P1420
Riboprobe® System—T3	1 system	P1430
Riboprobe® System—T7	1 system	P1440

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Riboprobe® Systems are designed for in vitro preparation of high-specific-activity single-stranded RNA probes or microgram quantities of defined RNA transcripts from cloned DNA inserts. These systems contain all components necessary for in vitro transcription from a DNA template (excluding the radioisotope) and also contain RQ1 RNase-Free DNase (Cat.# M6101) for template removal following transcription.

Features:

- **Specific:** SP6, T7 and T3 RNA Polymerases are extremely promoter-specific, allowing production of virtually homogeneous RNA using plasmid DNA as a template.
- **Choice of Enzyme:** Systems available with SP6 RNA Polymerase, T7 RNA Polymerase or T3 RNA Polymerase.
- **Convenient:** Includes positive control template for use with SP6, T7 or T3 RNA Polymerase, DNase I for removal of DNA template and Recombinant RNasin® Ribonuclease Inhibitor.

Storage Conditions: Store at –20°C.

Riboprobe® Combination Systems

Product	Size	Cat.#
Riboprobe® Combination System—T3/T7 RNA Polymerase	1 system	P1450
Riboprobe® Combination System—SP6/T7 RNA Polymerase	1 system	P1460

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Riboprobe® Combination Systems are designed for in vitro preparation of high-specific-activity single-stranded RNA probes or microgram quantities of defined RNA transcripts from cloned DNA inserts. The Riboprobe® Combination Systems include the RNA polymerases, all of the required reagents (excluding radioisotope) for performing transcription reactions in vitro and RQ1 RNase-Free DNase (Cat.# M6101) for removal of the template following transcription.

Features:

- **Flexible:** Allows synthesis of RNA corresponding to either the coding or noncoding strand of cloned DNA from a single plasmid construct.
- **Specific:** SP6, T7 and T3 RNA Polymerases are extremely promoter-specific, allowing production of virtually homogeneous RNA using plasmid DNA as a template.
- **Convenient:** Includes positive control template for use with T7, T3 or SP6 RNA polymerase, DNase I for removal of DNA template and Recombinant RNasin® Ribonuclease Inhibitor.

Storage Conditions: Store at –20°C.

Riboprobe® System Components and Buffers

Product	Size	Conc.	Cat.#
Riboprobe® System Buffers	1 system		P1121
rATP, rCTP, rGTP, rUTP, each at 10mM in separate tubes	0.5 ml	mM	P1221
Available Separately	**Size**	**Conc.**	**Cat.#**
RQ1 RNase-Free DNase	1,000 u	1 u/µl	M6101
rATP, 10mM	0.5 ml	mM	P1132
rCTP, 10mM	0.5 ml	mM	P1142
rGTP, 10mM	0.5 ml	mM	P1152
rUTP, 10mM	0.5 ml	mM	P1162
DTT, Molecular Grade	100 µl	100 mM	P1171
Transcription Optimized 5X Buffer	200 µl		P1181
Nuclease-Free Water	50 ml		P1193

M6101, P1132, P1221, P1142, P1152, P1162, P1171, P1193 For Laboratory Use. P1121, P1181 For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Riboprobe® System Buffers are components of the single and combination Riboprobe® Systems. The buffers are also available as standalone products.

RQ1 RNase-Free DNase is used to remove template DNA from RNA preparations and is qualified for use in applications where maintaining the integrity of RNA is critical. Product is quality tested to ensure the absence of detectable RNase activity. 10X Reaction Buffer and 10X Stop Buffer included.

rATP, rCTP, rGTP and rUTP are provided in individual tubes, qualified for use with the Riboprobe® Systems. The rNTPs are supplied in nuclease-free water. Purity has been verified by HPLC analysis.

Features:

- **Pretested:** Reagents are tested with other Riboprobe® System components. rNTPs are tested for functionality with in vitro transcription reactions.
- **Transcription Qualified:** Reagents are qualified for use for in vitro transcription reactions with SP6, T7 or T3 RNA Polymerase.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Ribo m^{7}G Cap Analog

Product	Size	Conc.	Cat.#
Ribo m^{7}G Cap Analog	10 A_{254} units	40 mM	P1711
	25 A_{254} units	40 mM	P1712

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The Ribo m^{7}G Cap Analog is a modified ribonucleotide with the structure (m^{7}G(5′)ppp(5′)G). This methylated ribonucleotide can be incorporated onto the 5′-end of transcripts synthesized in vitro and simulates the 7-methyl guanosine 5′-cap structure found on most eukaryotic mRNA molecules.

Features:

- **Improved Translation:** Enhances translation efficiency in many reticulocyte-based reactions.
- **Effective:** Protects RNA from intracellular digestion.
- **Flexible:** Can be used in either the Riboprobe® Systems or RiboMAX™ Large Scale RNA Production Systems.

Storage Conditions: Store at –20°C.

pGEM® Express Positive Control Template

Product	Size	Cat.#
pGEM® Express Positive Control Template	10 µg	P2561

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pGEM® Express Positive Control Template is created by linearizing a vector with the restriction enzyme ScaI. The Positive Control Template may be used to monitor in vitro transcription reactions when using the Riboprobe® Systems.

Features:

- **Multi-Sized RNAs:** SP6 RNA polymerase produces transcripts of 1,787 and 2,566 bases; T7 RNA polymerase produces transcripts of 1,065 and 2,346 bases; T3 RNA Polymerase produces transcripts of 250 and 1,525 bases.
- **Flexible:** Template can be used with SP6, T7 or T3 RNA polymerases.

Storage Conditions: Store at –20°C.

TFIIB, Human, Recombinant

Product	Size	Cat.#
rhTFIIB	50 gsu	E3790

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: rhTFIIB is a general transcription factor involved in formation of an active complex in vitro capable of specifically initiating RNA synthesis by RNA polymerase II. An early stage of initiation complex assembly involves the formation of a D-B or D-A-B complex, which consists of TFIID, TFIIB (TFIIA) and the promoter DNA. The stability of the D-B and D-A-B complexes is thought to be greater than that of TFIID and DNA alone. The full-length human cDNA for TFIIB is expressed in *E. coli* and has a molecular weight of 32kDa. TFIIB alone does not have DNA-binding activity.

Features:

- **Performance-Tested:** Tested by gel shift assay for the formation of the D-B complex. Tested for in vitro transcriptional activity.

Storage Conditions: Store at –70°C.

Transcription Factor Consensus Oligonucleotides

Product	Size	Conc.	Cat.#
AP1 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3201
	35 pmol	1.75 pmol/µl	E3202
AP2 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3211
	35 pmol	1.75 pmol/µl	E3212
CREB Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3281
	35 pmol	1.75 pmol/µl	E3282
NF-κB Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3291
	35 pmol	1.75 pmol/µl	E3292
OCT1 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3241
	35 pmol	1.75 pmol/µl	E3242
SP1 Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3231
	35 pmol	1.75 pmol/µl	E3232
TFIID Consensus Oligonucleotide	175 pmol	1.75 pmol/µl	E3221
	35 pmol	1.75 pmol/µl	E3222

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Description: The electrophoretic mobility shift assay (EMSA, gel shift, gel retardation) is a relatively simple and sensitive method to investigate protein:DNA interactions. These oligonucleotides contain consensus DNA-binding sites for individual sequence-specific transcription factors. The double-stranded oligonucleotides are designed with 5′ OH blunt ends, making them easily labeled to high specific activity with T4 polynucleotide kinase.

Storage Conditions: Store at –20°C.

Characteristics of the Consensus Oligonucleotides and Binding Proteins.

AP1 (c-jun)
5′-CGC TTG ATG AGT CAG CCG GAA-3′
3′-GCG AAC TAC TCA GTC GGC CTT-5′
Forms DNA binding dimers with other members of the AP1 family and with Fos through leucine zipper formation.

AP2
5′-GAT CGA ACT GAC CGC CCG CGG CCC GT-3′
3′-CTA GCT TGA CTG GCG GGC GCC GGG CA-5′
May act independently as both a TPA- and cAMP-inducible element and can be specifically inhibited by large T antigen.

CREB
5′-AGA GAT TGC CTG ACG TCA GAG AGC TAG-3′
3′-TCT CTA ACG GAC TGC AGT CTC TCG ATC-5′
Confers responsiveness to cAMP; it contains a leucine zipper motif for dimerization, and the associated basic domain is homologous to c-Jun DNA binding domains.

NF-κB
5′-AGT TGA GGG GAC TTT CCC AGG C-3′
3′-TCA ACT CCC CTG AAA GGG TCC G-5′
Binds to κ light chain enhancer in B cells and is present in a covert cytoplasmic form in non-B cells.

OCT1
5′-TGT CGA ATG CAA ATC ACT AGA A-3′
3′-ACA GCT TAC GTT TAG TGA TCT T-5′
A member of the OCT family, which is apparently ubiquitous in mammalian cells, the bipartite POU domain includes the POU-box and the homeo domain.

SP1
5′-ATT CGA TCG GGG CGG GGC GAG C-3′
3′-TAA GCT AGC CCC GCC CCG CTC G-5′
O-glycosylated transcription factor with sequence specificity conferred through three zinc fingers in the DNA binding domain.

TFIID
5′-GCA GAG CAT ATA AGG TGA GGT AGG A-3′
3′-CGT CTC GTA TAT TCC ACT CCA TCC T-5′
A general transcription factor that exhibits specific DNA binding to the TATA box. This factor is associated with RNA polymerase I, II and III activities.

9491LA

HeLaScribe® Nuclear Extract in vitro Transcription System

Product	Size	Cat.#
HeLaScribe® Nuclear Extract in vitro Transcription System	40 reactions	E3110

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The most well characterized cell-free system for in vitro transcription of eukaryotic genes is derived from HeLa cell nuclei. HeLa nuclear extracts can support accurate transcription initiation by RNA polymerase II and exhibit both basal and regulated patterns of RNA polymerase transcription. The nuclear extract is also a source for a variety of transcription factors, DNA-binding proteins and the enzymatic machinery involved in RNA processing.

The HeLa Nuclear Extract included in the HeLaScribe® Nuclear Extract in vitro Transcription System is prepared by a modification of the method of Dignam *et al.* Extracts prepared by this method have been shown to allow transcription from the human transferrin gene promoter and the adenovirus 2 major late promoter. The system also includes all of the necessary components for in vitro transcription as well as a positive control template (CMV immediate early promoter DNA).

Features:

- **Peformance-Tested:** Tested with cytomegalovirus immediate early gene (CMV) promoter.
- **Convenient:** Available as a complete transcription system or extract alone.
- **Positive Control:** System contains a CMV promoter-positive control template.

Storage Conditions: Store at –70°C. Avoid multiple freeze-thaw cycles of the extract.

In vitro Transcription Systems Related Products

Product	Size	Cat.#
HeLaScribe® Nuclear Extract in vitro Transcription Grade	40 reactions	E3091
	160 reactions	E3092
HeLaScribe® Nuclear Extract Positive Control DNA	300 ng	E3621
rCTP, rATP, rUTP, rGTP, 100mM each	4 × 400 µl	E6000
rATP, 100mM	400 µl	E6011
rUTP, 100mM	400 µl	E6021
rGTP, 100mM	400 µl	E6031
rCTP, 100mM	400 µl	E6041

E3091, E3092, E3621 For Research Use Only. Not for Use in Diagnostic Procedures. E6000, E6011, E6021, E6031, E6041 For Laboratory Use.

Description: HeLaScribe® Nuclear Extract, in vitro Transcription Grade, derived from HeLa cell nuclei, provides a cell-free system for in vitro transcription of eukaryotic genes.

Storage Conditions: Store HeLaScribe® Nuclear Extracts at –70°C. Store other components at –20°C.

Primer Extension System—AMV Reverse Transcriptase

Product	Size	Cat.#
Primer Extension System—AMV Reverse Transcriptase	40 reactions	E3030

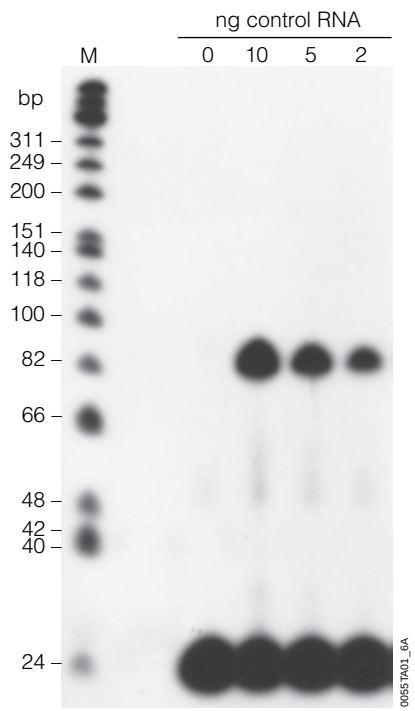
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Primer Extension System—AMV Reverse Transcriptase can be used to quantitate specific mRNA transcripts and map the start sites of transcription. An end-labeled oligonucleotide is hybridized to RNA and is used as a primer by reverse transcriptase in the presence of deoxynucleotides. The RNA is thus reverse transcribed into cDNA and is analyzed on a denaturing polyacrylamide gel. The length of the cDNA reflects the number of bases between the labeled nucleotide of the primer and the 5´-end of the RNA; the quantity of cDNA product is related to the amount of targeted RNA.

Features:

- **Convenient:** System includes control RNA and primer as well as size markers ready for phosphorylation with T4 Polynucleotide Kinase.

Storage Conditions: All components must be stored at –20°C, except for the control RNA, which must be stored at –70°C.



Gel analysis of ^{32}P-labeled ΦX174 DNA/HinfI markers and control RNA primer extension products produced using the Primer Extension System— AMV Reverse Trancriptase (Cat.# E3030).

Available in the Helix® on-site stocking system

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RNA Interference

GeneClip™ U1 Hairpin Cloning Systems

Product	Size	Cat.#
GeneClip™ U1 Hairpin Cloning System—Basic	1 system	C8750
GeneClip™ U1 Hairpin Cloning System—Puromycin	1 system	C8760
GeneClip™ U1 Hairpin Cloning System—Hygromycin	1 system	C8770
GeneClip™ U1 Hairpin Cloning System—Neomycin	1 system	C8780
GeneClip™ U1 Hairpin Cloning System—hMGFP	1 system	C8790

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The GeneClip™ U1 Hairpin Cloning Systems consist of linearized plasmids designed for fast and easy cloning of human target sequences to express short hairpin RNAs (shRNAs) in human cells. After transfection into human cells, in vivo expression of short interfering RNAs (siRNAs) can be effectively achieved from DNA constructs that contain a U1 RNA polymerase promoter and a siRNA template. The U1 promoter has been used successfully to generate hairpin siRNAs in vivo.

To insert hairpin siRNAs into the pGeneClip™ Vectors, two short DNA oligonucleotides are annealed to form a DNA insert that contains the hairpin siRNA target sequence. After annealing, the oligonucleotides form overhangs that are compatible with the pGeneClip™ Vector ends and facilitate sticky-end ligation. Once transfected, RNA polymerase II transcribes the hairpin insert sequences to generate hairpin siRNAs in vivo.

Features:

- **More Vector Choices:** These systems provide vectors containing a variety of eukaryotic antibiotic-selectable markers for stable transfection or hMGFP for determination of transfection efficiency.
- **Time Savings:** Vectors are supplied predigested to eliminate time-consuming vector preparation.
- **Convenience:** Each system includes T4 DNA Ligase, 2X Rapid Ligation Buffer, Oligo Annealing Buffer and the pGeneClip™ Vector.
- **Easier Identification of Desired Clones:** A PstI digestion quickly identifies positive recombinants.

Storage Conditions: Store at –20°C.

T7 RiboMAX™ Express RNAi System

Product	Size	Cat.#
T7 RiboMAX™ Express RNAi System	50 × 20µl reactions	P1700

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The T7 RiboMAX™ Express RNAi System is an in vitro transcription system designed for producing milligram amounts of double-stranded RNA (dsRNA) in a short amount of time. The dsRNA is free of protein and other contaminants and is suitable for use in RNA interference (RNAi) in both mammalian and nonmammalian systems.

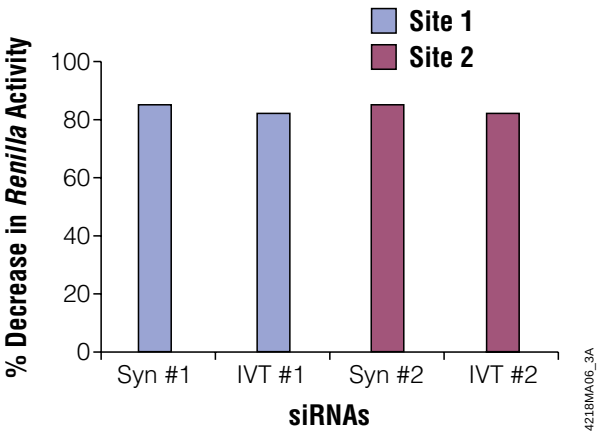
The T7 RiboMAX™ Express RNAi System can be used to synthesize short interfering RNAs (siRNAs) of 21bp for use in mammalian systems. siRNAs synthesized in vitro have been demonstrated to be as effective as chemically synthesized siRNAs for inducing RNAi in mammalian cells.

In addition, the T7 RiboMAX™ Express RNAi System can be used for the synthesis of dsRNA molecules of approximately 200bp or greater, which can be applied to nonmammalian systems. Two complementary RNA strands are synthesized from DNA template (either plasmid or PCR product). The resulting RNA strands are annealed after the transcription reaction to form dsRNA. Any remaining single-stranded RNA and DNA template are removed with a nuclease digestion step. The dsRNA is then purified by isopropanol precipitation and can be introduced into the organism of choice for RNAi applications.

Features:

- **Save Time:** The T7 RiboMAX™ Express RNAi System produces milligram amounts of RNA in as little as 30 minutes.
- **Minimize Pipetting Errors:** The four rNTPs and 2X transcription buffer have been combined, thus minimizing pipetting errors and setup time.

Storage Conditions: Store all components at –20°C, except RNase A, which should be stored at 22–25°C after the initial thaw.



Comparison of RNA interference induced by siRNAs synthesized chemically and by in vitro transcription. Two different target luciferase sequences were synthesized by in vitro transcription using the T7 RiboMAX™ Express RNAi System (IVT #1 and #2) and synthesized chemically (Syn #1 and #2). After transfection using CodeBreaker™ Transfection Reagent, these siRNAs were evaluated for RNA interference in CHO cells stably expressing luciferase.

psiCHECK™-1 and psiCHECK™-2 Vectors

Product	Size	Cat.#
psiCHECK™-1 Vector	20 µg	C8011
psiCHECK™-2 Vector	20 µg	C8021

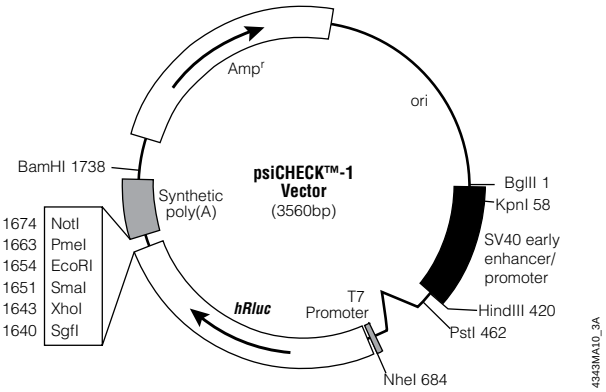
For Research Use Only. Not for Use in Diagnostic Procedures.

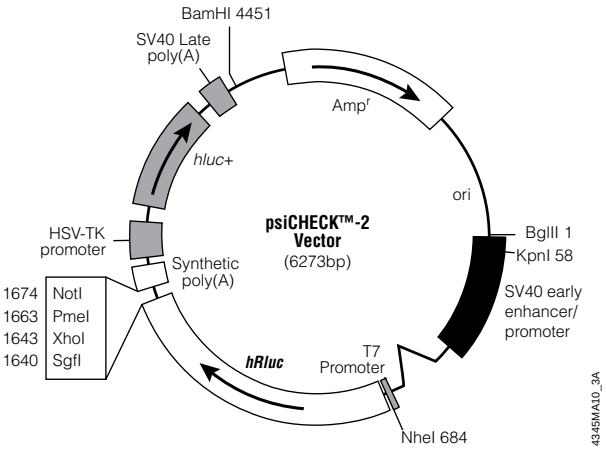
Description: The psiCHECK™-1 and psiCHECK™-2 Vectors are designed to provide a quantitative and rapid approach for initial optimization of RNA interference (RNAi). The vectors enable monitoring of changes in expression of a target gene fused to a reporter gene. In both vectors *Renilla* luciferase is used as the primary reporter gene, and the gene of interest is cloned into a multiple cloning region located downstream of the *Renilla* translational stop codon. Initiation of the RNAi process by synthetic siRNAs or in vivo-expressed shRNAs toward a gene of interest results in cleavage and subsequent degradation of the fusion mRNA. Measuring decreases in *Renilla* activity provides a convenient way of monitoring the RNAi effect. In comparison with other fusion approaches (e.g., GFP or flag-tags), the *Renilla* luciferase approach offers more convenient and rapid quantitation with higher sensitivity. The psiCHECK™-1 Vector is recommended for use in monitoring RNAi effects in live cells. The changes in *Renilla* luciferase activity are measured with the EnduRen™ Live Cell Substrate (Cat.# E6481), which allows continuous monitoring of intracellular *Renilla* luminescence. The psiCHECK™-2 Vector contains a second reporter gene, firefly luciferase, and is designed for endpoint lytic assays. Introduction of firefly luciferase in the psiCHECK™-2 Vector allows normalization of *Renilla* luciferase expression, achieving robust and reproducible results.

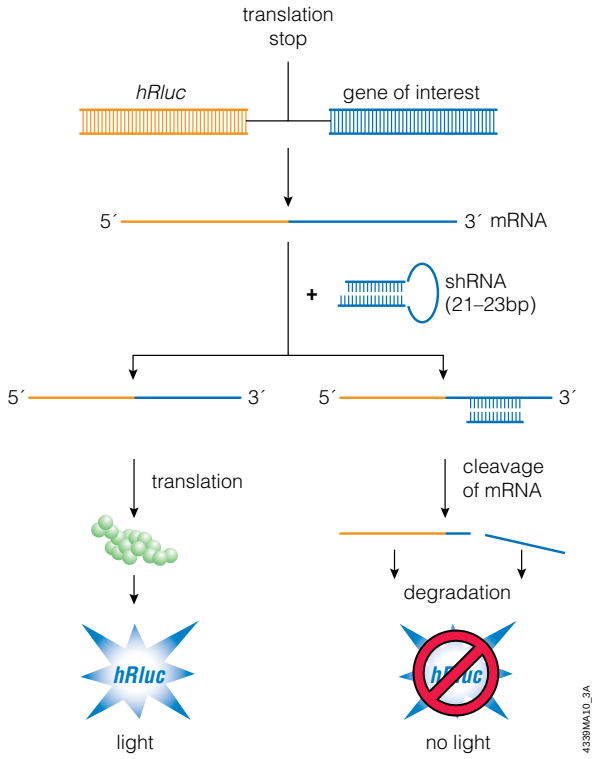
Features:

- **Save Money:** Quantitation is performed with a common luminometer; no need to purchase expensive equipment.
- **Choose Your Format:** Protocols allow for measurements in live cells or crude cell lysates.
- **Save Time:** No requirement for labor-intensive, time-consuming assays or waiting for phenotypic changes.
- **Convenient:** No requirement for transfection normalization when using the psiCHECK™-2 Vector.

Storage Conditions: Store at –20°C.







Mechanism of action of the psiCHECK™ Vectors.

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Streamline Your RNA Analysis Workflow

From purification to gene expression analysis, Promega offers quality solutions for every step in your RNA workflow.

- Scalable tools for comprehensive sample prep, protection, quantitation and amplification.
- Trusted, quality products for RNA handling increase your chance of success in downstream applications.

RNA Analysis workflow

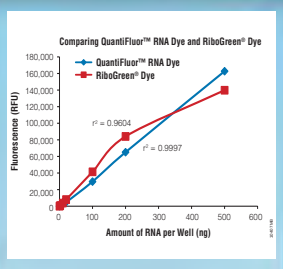
Purify

Whether you choose semi-automated or manual methods, Promega offers a variety of scalable RNA purification options to meet your needs.

Protect

RNases are ubiquitous, cause RNA degradation and severely hamper downstream applications. Recombinant RNasin® Ribonuclease Inhibitor offers superior protection and is compatible with downstream procedures.

Quantitate



Sensitive RNA quantitation is important for success in downstream applications. The QuantiFluor® RNA System contains a fluorescent RNA-binding dye that enables sensitive quantitation of small amounts of RNA in solution.

Amplify

Precise, accurate RT-qPCR analysis can be difficult when target copy number is low or when PCR inhibitors are present. The GoTaq® Systems provide reliable reagents for cDNA synthesis, 1-step and 2-step RT-qPCR, and qPCR using either probe or dye-based detection.

Promega

Start simplifying your workflow with solutions designed to work together:

www.promega.com/RNAWorkflow

20 Stem Cell Research

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Available in the Helix® on-site stocking system

Cell Line Authentication

GenePrint® 10 System

Product	Size	Cat.#
GenePrint® 10 System	50 reactions	B9510
Available Separately	**Size**	**Conc.**	**Cat.#**
2800M Control DNA	25 µl	10 ng/µl	DD7101
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991

B9510, DD7101, DW0991 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The *GenePrint*® 10 System allows co-amplification and three-color detection of nine human loci, including the ASN-0002 loci (TH01, TPOX, vWA, Amelogenin, CSF1PO, D16S539, D7S820, D13S317 and D5S818) as well as D21S11. These loci collectively provide a genetic profile with a random match probability of 1 in 2.92×10^9.

The *GenePrint*® 10 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers. You may need to optimize protocols including the amount of template DNA, cycle number, injection conditions and loading volume for your laboratory instrumentation.

The *GenePrint*® 10 System contains all materials necessary to amplify STR regions of human genomic DNA, including a hot-start thermostable DNA polymerase, which is a component of the *GenePrint*® 10 5X Master Mix. An internal lane standard (ILS) and allelic ladder are provided for standardization, and the 2800M Control DNA is supplied as a positive control. The ILS is added to every sample after amplification and used within each capillary electrophoresis run to determine the size of each amplified product. The allelic ladder consists of the most common alleles at a particular locus and is used as a standard to positively identify each allele. *GenePrint*® 10 Allelic Ladder Mix information, including the size range and repeat numbers for each allele, can be found in the Technical Manual. The 2800M Control DNA has a known genotype and can be used to verify genotyping accuracy.

Features:

- **Amplification of ANSI-0002-Recommended Loci** (plus Amelogenin and D21S11 for extra power of discrimination): Accurately discriminate between biological samples and human cell lines. The resulting STR profiles are compatible with publicly available databases. Fewer loci simplify data interpretation.
- **Improved Buffer Formulation:** Compatibility with direct amplification from FTA® and nonFTA cards saves labor and time and reduces manipulation and possible introduction of inhibitors or contaminants.
- **Tolerance of Higher DNA Template Input:** Better balance for aneuploid samples.
- **Reduced PCR Time:** Amplify in less than 1.5 hours.
- **One Complete Kit:** Validated and quality-control tested for sample identification and cell line authentication.
- **Automatic Assignment of Genotypes:** Panels and bins text files are required to automatically assign genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Storage Conditions: Store at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.

PowerPlex® Fusion System

Product	Size	Cat.#
PowerPlex® Fusion System	200 reactions	DC2402
	800 reactions	DC2408

Available Separately	Size	Conc.	Cat.#
PowerPlex® 5-Dye Matrix Standards, 3100/3130	25 µl		DG4700
2800M Control DNA	25 µl	10 ng/µl	DD7101
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991

Not For Medical Diagnostic Use.

Description: The PowerPlex® Fusion System is a 24-locus multiplex for human identification applications including forensic analysis, relationship testing and research use. This five-color system allows co-amplification and fluorescent detection of the 13 core CODIS (US) loci (CSF1PO, FGA, TH01, TPOX, vWA, D3S1358, D5S818, D7S820, D8S1179, D13S317, D16S539, D18S51 and D21S11), the 12 core European Standard Set loci (TH01, vWA, FGA, D21S11, D3S1358, D8S1179, D18S51, D10S1248, D22S1045, D2S441, D1S1656 and D12S391) and Amelogenin for gender determination. In addition, the male-specific DYS391 locus is included to identify null Y allele results for Amelogenin. The Penta D, Penta E, D2S1338 and D19S433 loci are included to increase discrimination and allow searching of databases that include profiles with these popular loci. This extended panel of STR markers is intended to satisfy both CODIS and ESS recommendations.

The PowerPlex® Fusion System works well with extracted DNA samples, including low amounts of template DNA, mixtures and inhibitor-laden samples. The PowerPlex® Fusion System also is compatible with direct amplification, enabling streamlined STR databasing efforts. Amplification can be successfully performed with sample types such as FTA® card punches as well as pretreated swabs, Bode Buccal DNA Collector™ punches or S&S 903 punches. Fast cycling conditions used with the PowerPlex® Fusion System reduce sample-processing time for all samples.

The PowerPlex® Fusion System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers.

Panels and bins text files are required for automatic assignment of genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

The PowerPlex® Fusion System was given NDIS approval in March 2013 for NDIS CODIS databasing.

Features:

Highest Interdatabase Compatibility and Discrimination:

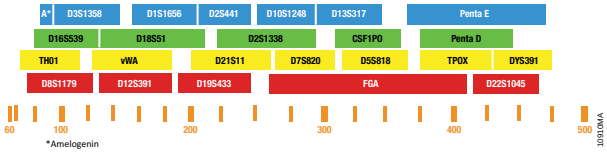
- 24 loci (23 STRs plus Amelogenin), including the CODIS and ESS required loci.
- Amplifies all loci found in Identifiler®, SGM Plus® and PowerPlex® 16, some of the most commonly used multiplexes over the last decade.

Streamlined Workflows: Direct-amplification protocols and rapid cycling.

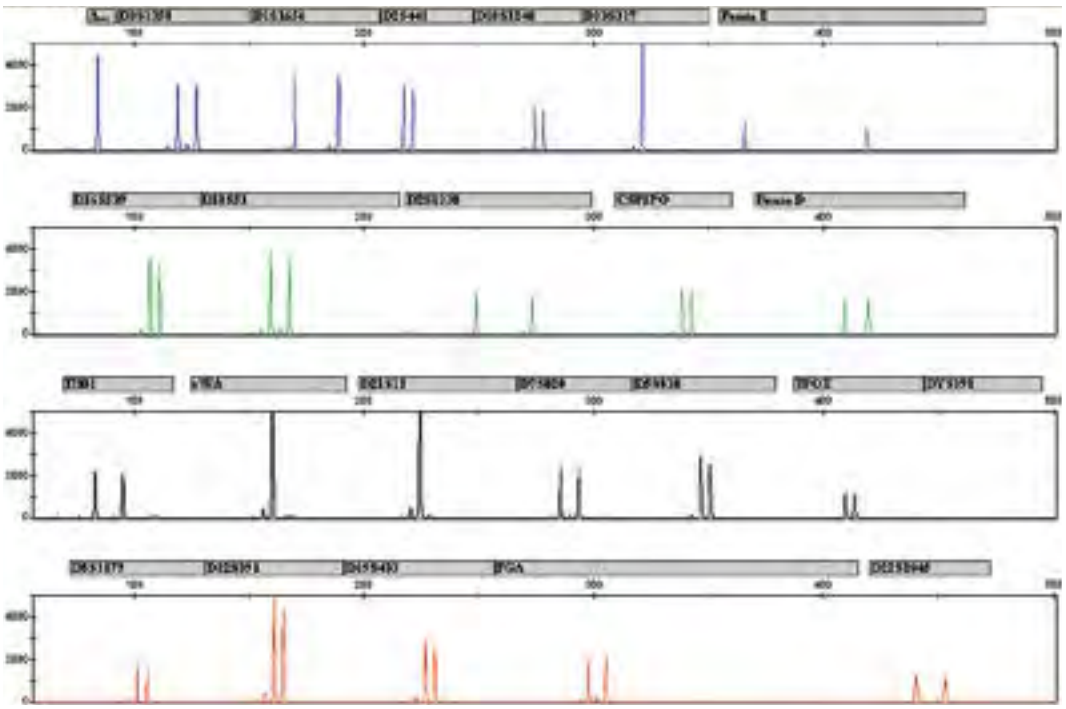
Less Repeat Analysis of Difficult Samples: High inhibitor tolerance and sensitivity for casework.

Easier Validation and QC: One kit for both casework and database sections.

Storage Conditions: Store kit at –20°C. Upon receipt, move 2800M Control DNA to 4°C storage.



The 24 loci included in the PowerPlex® Fusion System. This system includes Amelogenin, D3S1358, D1S1656, D2S441, D10S1248, D13S317 and Penta E labeled with fluorescein; D16S539, D18S51, D2S1338, CSF1PO and Penta D labeled with JOE; TH01, vWA, D21S11, D7S820, D5S818, TPOX and DYS391 labeled with TMR-ET; and D8S1179, D12S391, D19S443, FGA and D22S1045 labeled with CXR-ET. The CC5 Internal Lane Standard 500 (CC5 ILS 500) is labeled with CC5 dye and contains 21 DNA fragments of 60, 65, 80, 100, 120, 140, 160, 180, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475 and 500 bases in length.



Direct amplification of two 1.2mm FTA® card punches from a buccal sample using the protocol described in the *PowerPlex® Fusion System Technical Manual* TMD039. Amplified products were separated on an Applied Biosystems® 3130*xl* Genetic Analyzer (3kV, 5-second injection).

Available in the Helix® on-site stocking system

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PowerPlex® 21 System

Product	Size	Cat.#
PowerPlex® 21 System	200 reactions	DC8902
	4 × 200 reactions	DC8942
Not For Medical Diagnostic Use.		

For additional information see page 9.

PowerPlex® 18D System

Product	Size	Cat.#
PowerPlex® 18D System	200 reactions	DC1802
	800 reactions	DC1808
Not For Medical Diagnostic Use.		

For additional information see page 10.

PowerPlex® 16 HS System

Product	Size	Cat.#
PowerPlex® 16 HS System	100 reactions	DC2101
	400 reactions	DC2100
Not For Medical Diagnostic Use.		

For additional information see page 9.

Stemness Assessment

StemElite® Gene Expression System

Product	Size	Cat.#
StemElite® Gene Expression System	100 qPCR reactions	B1001
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The StemElite® Gene Expression System is a novel real-time quantitative PCR (qPCR) system for the detection and relative quantification of RNA expression levels associated with the differentiation state or 'potency' of cells. The StemElite® Gene Expression System is optimized to quantitatively amplify a two-color duplex, enabling the user to amplify a transcript of interest as well as a reference gene in a single reaction.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH or Actb).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Human Pluripotent Transcripts

Product	Size	Cat.#
StemElite® NANOG/GAPDH Primer Pair (20X)	100 µl	B1011
StemElite® SOX2/GAPDH Primer Pair (20X)	100 µl	B1021
StemElite® POU5F1/GAPDH Primer Pair (20X)	100 µl	B1031
StemElite® LIN28/GAPDH Primer Pair (20X)	100 µl	B1041
StemElite® KLF4/GAPDH Primer Pair (20X)	100 µl	B1051
StemElite® MYC/GAPDH Primer Pair (20X)	100 µl	B1061
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: NANOG, SOX2, POU5F1, LIN28, KLF4 and MYC are functionally associated with maintenance of the undifferentiated human embryonic stem cell.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Human Heart-Associated Transcripts

Product	Size	Cat.#
StemElite® NPPA/GAPDH Primer Pair (20X)	100 µl	B1071
StemElite® MYL7/GAPDH Primer Pair (20X)	100 µl	B1081
StemElite® MYL2/GAPDH Primer Pair (20X)	100 µl	B1091
StemElite® MYH6/GAPDH Primer Pair (20X)	100 µl	B1101
StemElite® MYH7/GAPDH Primer Pair (20X)	100 µl	B1111
StemElite® NKX2-5/GAPDH Primer Pair (20X)	100 µl	B1121
StemElite® TNNT2/GAPDH Primer Pair (20X)	100 µl	B1131
StemElite® TNNI3/GAPDH Primer Pair (20X)	100 µl	B1141
StemElite® MEF2C/GAPDH Primer Pair (20X)	100 µl	B1151
StemElite® PLN/GAPDH Primer Pair (20X)	100 µl	B1161
StemElite® GATA4/GAPDH Primer Pair (20X)	100 µl	B1171
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Pluripotential stem cells can give rise to differentiated cells and tissues for all three embryonic germ layers. NPPA, MYL7, MYL2, MYH6, MYH7, NKX2-5, TNNT2, TNNI3, MEF2C, PLN and GATA4 are mesodermal markers associated with differentiation of cardiac muscle.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Human Pancreatic-Associated Transcripts

Product	Size	Cat.#
StemElite® HNF4A/GAPDH Primer Pair (20X)	100 µl	B1301
StemElite® HNF1B/GAPDH Primer Pair (20X)	100 µl	B1311
StemElite® PDX1/GAPDH Primer Pair (20X)	100 µl	B1321
StemElite® INS/GAPDH Primer Pair (20X)	100 µl	B1331
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Pluripotential stem cells can give rise to differentiated cells and tissues for all three embryonic germ layers. HNF4A, HNF1B, PDX1 and INS are mesodermal markers associated with differentiation of pancreatic cells.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

StemElite® Differentiation-Associated Transcripts

Product	Size	Cat.#
StemElite® FOXA2/GAPDH Primer Pair (20X)	100 µl	B1341
StemElite® SOX17/GAPDH Primer Pair (20X)	100 µl	B1351
StemElite® GATA6/GAPDH Primer Pair (20X)	100 µl	B1361
Available Separately	**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions	B1002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Pluripotential stem cells can give rise to differentiated cells and tissues for all three embryonic germ layers. FOXA2, SOX17 and GATA6 are nonspecific differentiation markers.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (GAPDH).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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Available in the Helix® on-site stocking system

StemElite® Mouse Pluripotent Transcripts

Product		Size	Cat.#
StemElite® Mus-Nanog/Actb Primer Pair (20X)		100 µl	B1371
StemElite® Mus-Sox2/Actb Primer Pair (20X)		100 µl	B1381
StemElite® Mus-Pou5f1/Actb Primer Pair (20X)		100 µl	B1391
StemElite® Mus-Lin28/Actb Primer Pair (20X)		100 µl	B1401
StemElite® Mus-Klf4/Actb Primer Pair (20X)		100 µl	B1411
StemElite® Mus-Myc/Actb Primer Pair (20X)		100 µl	B1421
Available Separately		**Size**	**Cat.#**
StemElite® Gene Expression System Plus	100 qPCR reactions + 50 RT reactions		B1002

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: Mus-Nanog, Mus-Sox2, Mus-Pou5f1, Mus-Lin28, Mus-Klf4 and Mus-Myc are functionally associated with maintenance of the undifferentiated mouse embryonic stem cell.

Features:

- Achieve sensitive real-time detection and relative quantification of RNA expression levels for monitoring stem cell differentiation in a multiplex amplification.
- Quantitatively amplify a two-color duplex.
- Amplify in a single tube the transcript of interest and reference transcript (Actb).
- Reduce the number of reactions required to measure multiple transcripts.
- Improve experimental data quality by measuring all of the transcripts in the same well.

Storage Conditions: Store at –20°C.

21 STR Analysis

Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

Cell Line Authentication

GenePrint® 10 System

Product	Size	Cat.#
GenePrint® 10 System	50 reactions	B9510
Available Separately	**Size**	**Conc.**	**Cat.#**
2800M Control DNA	25 µl	10 ng/µl	DD7101
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991

B9510, DD7101, DW0991 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

Description: The *GenePrint*® 10 System allows co-amplification and three-color detection of nine human loci, including the ASN-0002 loci (TH01, TPOX, vWA, Amelogenin, CSF1PO, D16S539, D7S820, D13S317 and D5S818) as well as D21S11. These loci collectively provide a genetic profile with a random match probability of 1 in 2.92×10^9.

The *GenePrint*® 10 System is compatible with the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130*xl*, 3500 and 3500xL Genetic Analyzers. You may need to optimize protocols including the amount of template DNA, cycle number, injection conditions and loading volume for your laboratory instrumentation.

The *GenePrint*® 10 System contains all materials necessary to amplify STR regions of human genomic DNA, including a hot-start thermostable DNA polymerase, which is a component of the *GenePrint*® 10 5X Master Mix. An internal lane standard (ILS) and allelic ladder are provided for standardization, and the 2800M Control DNA is supplied as a positive control. The ILS is added to every sample after amplification and used within each capillary electrophoresis run to determine the size of each amplified product. The allelic ladder consists of the most common alleles at a particular locus and is used as a standard to positively identify each allele. *GenePrint*® 10 Allelic Ladder Mix information, including the size range and repeat numbers for each allele, can be found in the Technical Manual. The 2800M Control DNA has a known genotype and can be used to verify genotyping accuracy.

Features:

- **Amplification of ANSI-0002-Recommended Loci**: (plus Amelogenin and D21S11 for extra power of discrimination): Accurately discriminate between biological samples and human cell lines. The resulting STR profiles are compatible with publicly available databases. Fewer loci simplify data interpretation.
- **Improved Buffer Formulation:** Compatibility with direct amplification from FTA® and nonFTA cards saves labor and time and reduces manipulation and possible introduction of inhibitors or contaminants.
- **Tolerance of Higher DNA Template Input:** Better balance for aneuploid samples.
- **Reduced PCR Time:** Amplify in less than 1.5 hours.
- **One Complete Kit:** Validated and quality-control tested for sample identification and cell line authentication.
- **Automatic Assignment of Genotypes:** Panels and bins text files are required to automatically assign genotypes using the GeneMapper® *ID* and *ID*-X software and are available for download.

Storage Conditions: Store at –20°C. Upon receipt, remove 2800M Control DNA and store at 4°C.

PowerPlex® Fusion System

Product	Size	Cat.#
PowerPlex® Fusion System	200 reactions	DC2402
	800 reactions	DC2408

Not For Medical Diagnostic Use.

For additional information see page 207.

PowerPlex® 21 System

Product	Size	Conc.	Cat.#
PowerPlex® 21 System	200 reactions		DC8902
	4 × 200 reactions		DC8942
Available Separately	**Size**	**Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251

Not For Medical Diagnostic Use.

For additional information see page 9.

PowerPlex® 18D System

Product	Size	Conc.	Cat.#
PowerPlex® 18D System	200 reactions		DC1802
	800 reactions		DC1808
Available Separately	**Size**	**Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl		DG1521
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101

Not For Medical Diagnostic Use.

For additional information see page 10.

PowerPlex® 16 HS System

Product	Size	Conc.	Cat.#
PowerPlex® 16 HS System	100 reactions		DC2101
	400 reactions		DC2100
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
9947A DNA	250 ng	10 ng/µl	DD1001

DC2101, DC2100, DW0991, DD7101, DD7251, DD1001 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.

For additional information see page 9.

Sample ID and Mixed Sample Detection

PowerPlex® 21 System

Product	Size	Cat.#
PowerPlex® 21 System	200 reactions	DC8902
	4 × 200 reactions	DC8942
Available Separately	**Size Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl	DG1521
Water, Amplification Grade	6,250 µl	DW0991
2800M Control DNA	25 µl 10 ng/µl	DD7101
	500 µl 0.25 ng/µl	DD7251
Not For Medical Diagnostic Use.		

For additional information see page 9.

PowerPlex® 18D System

Product	Size	Cat.#
PowerPlex® 18D System	200 reactions	DC1802
	800 reactions	DC1808
Available Separately	**Size Conc.**	**Cat.#**
CC5 Internal Lane Standard 500	300 µl	DG1521
Water, Amplification Grade	6,250 µl	DW0991
2800M Control DNA	25 µl 10 ng/µl	DD7101
Not For Medical Diagnostic Use.		

For additional information see page 10.

PowerPlex® 16 HS System

Product	Size	Conc.	Cat.#
PowerPlex® 16 HS System	100 reactions		DC2101
	400 reactions		DC2100
Available Separately	**Size**	**Conc.**	**Cat.#**
Internal Lane Standard 600	150 µl		DG1071
Water, Amplification Grade	6,250 µl		DW0991
2800M Control DNA	25 µl	10 ng/µl	DD7101
	500 µl	0.25 ng/µl	DD7251
9947A DNA	250 ng	10 ng/µl	DD1001
DC2101, DC2100, DW0991, DD7101, DD7251, DD1001 Not For Medical Diagnostic Use. DG1071 For Laboratory Use.			

For additional information see page 9.

STR Analysis for Forensic and Paternity Testing

For additional information see page 205.

Available in the Helix® on-site stocking system

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22 Vectors

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For more information visit: **www.promega.com/helix**

Bacterial Expression Vectors

HaloTag® Vectors for *E. coli* and Cell-Free Protein Expression

Product	Size	Cat.#
pH6HTN His_6HaloTag® T7 Vector	20 µg	G7971
pH6HTC His_6HaloTag® T7 Vector	20 µg	G8031
pF1A T7 Flexi® Vector	20 µg	C8441
pF1K T7 Flexi® Vector	20 µg	C8451
pFN18A HaloTag® T7 Flexi® Vector	20 µg	G2751
pFN18K HaloTag® T7 Flexi® Vector	20 µg	G2681
pFN19A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1891
pFN19K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1841
pFC20A HaloTag® T7 SP6 Flexi® Vector	20 µg	G1681
pFC20K HaloTag® T7 SP6 Flexi® Vector	20 µg	G1691
pFN29A His_6HaloTag® T7 Flexi® Vector	20 µg	G8261
pFN29K His_6HaloTag® T7 Flexi® Vector	20 µg	G8331
pFC30A His_6HaloTag® T7 Flexi® Vector	20 µg	G8321
pFC30K His_6HaloTag® T7 Flexi® Vector	20 µg	G8381

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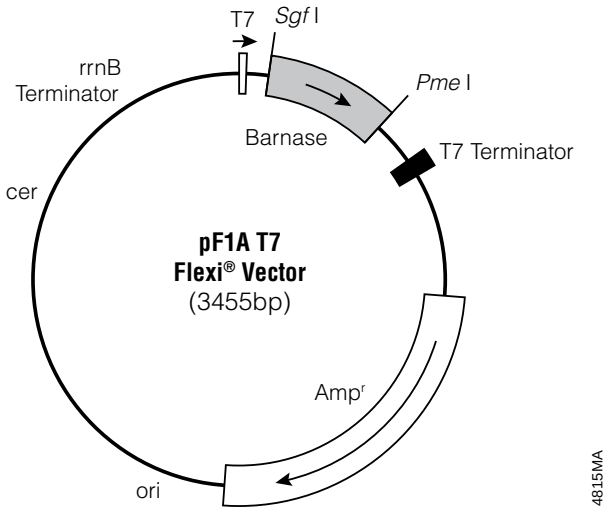
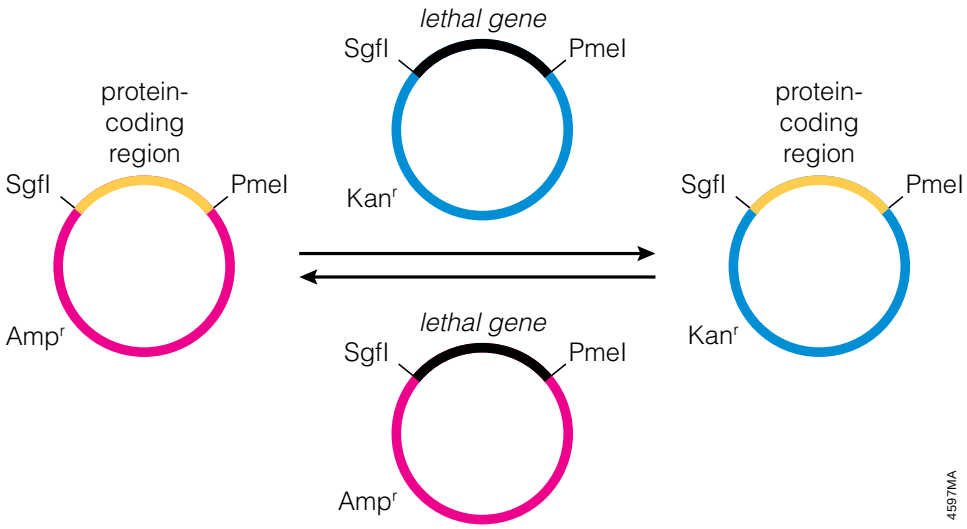
For additional information see page 302.





Transferring coding regions in the Flexi® Vector System.

Mammalian Expression Vectors

Untagged Flexi® Mammalian Expression Vectors

Product	Size	Cat.#
pF4A CMV Flexi® Vector	20 µg	C8481
pF4K CMV Flexi® Vector	20 µg	C8491
pF5A CMV-neo Flexi® Vector	20 µg	C9401
pF5K CMV-neo Flexi® Vector	20 µg	C9411
pF9A CMV *hRluc*-neo Flexi® Vector	20 µg	C9361
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 132.

HaloTag® Fusion (C-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTC HaloTag® CMV-neo Vector	20 µg	G7711
pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	G8421
pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	G8431
pFC14A HaloTag® CMV Flexi® Vector	20 µg	G9651
pFC14K HaloTag® CMV Flexi® Vector	20 µg	G9661
pFC15A HaloTag® CMV*d1* Flexi® Vector	20 µg	G1611
pFC15K HaloTag® CMV*d1* Flexi® Vector	20 µg	G1601
pFC16A HaloTag® CMV*d2* Flexi® Vector	20 µg	G1591
pFC16K HaloTag® CMV*d2* Flexi® Vector	20 µg	G1571
pFC17A HaloTag® CMV*d3* Flexi® Vector	20 µg	G1551
pFC17K HaloTag® CMV*d3* Flexi® Vector	20 µg	G1321
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 300.

HaloTag® Fusion (N-Terminal) Mammalian Expression Vectors

Product	Size	Cat.#
pHTN HaloTag® CMV-neo Vector	20 µg	G7721
pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	G8441
pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	G8451
pFN21A HaloTag® CMV Flexi® Vector	20 µg	G2821
pFN21K HaloTag® CMV Flexi® Vector	20 µg	G2831
pFN22A HaloTag® CMV*d1* Flexi® Vector	20 µg	G2841
pFN22K HaloTag® CMV*d1* Flexi® Vector	20 µg	G2851
pFN23A HaloTag® CMV*d2* Flexi® Vector	20 µg	G2861
pFN23K HaloTag® CMV*d2* Flexi® Vector	20 µg	G2871
pFN24A HaloTag® CMV*d3* Flexi® Vector	20 µg	G2881
pFN24K HaloTag® CMV*d3* Flexi® Vector	20 µg	G2981
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 301.

pAdVAntage™ Vector

Product	Size	Cat.#
pAdVAntage™ Vector	20 µg	E1711
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: Co-transfection of mammalian cells with the pAdVAntage™ Vector enhances transient protein expression in a variety of cell types by increasing translation initiation.

Transfection of mammalian cells with an expression vector often results in suboptimal expression of the protein of interest. Double-stranded RNA (dsRNA) generated during transfection is thought to activate the dsRNA-activated inhibitor (DAI), one of several enzymes involved in the host cell's antiviral defense system. DAI phosphorylates the translation initiation factor eIF-2, halting translation and therefore protein production.

However, DAI translation inhibition can be overcome with the adenoviral Virus Associated I RNA (VAI RNA) produced by RNA polymerase III following co-transfection with the pAdVAntage™ Vector. The VAI RNA binds to DAI, preventing its activation, thereby allowing translation and protein expression.

Features:

- **Increased Expression:** Co-transfection of pAdVAntage™ Vector with luciferase constructs showed at least a tenfold increase in luciferase expression in 293 and HeLa cell lines over transfections performed with the construct DNA alone.
- **Flexible:** Can be used in a variety of cell lines.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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pSI Mammalian Expression Vector

Product	Size	Cat.#
pSI Mammalian Expression Vector	20 µg	E1721

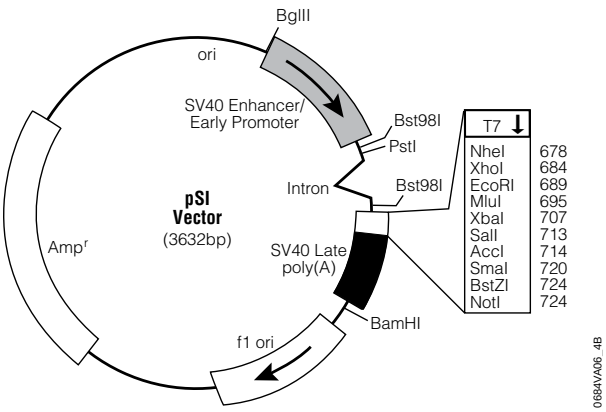
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pSI Mammalian Expression Vector promotes constitutive expression of cloned DNA inserts in mammalian cells. The major difference between the pCI and pSI Mammalian Expression Vectors is the enhancer/promoter region controlling expression of the inserted gene. The pSI Expression Vector contains the simian virus 40 (SV40) enhancer and early promoter region. This vector can be used for both transient and stable expression of genes. For stable expression, the pSI Vector must be co-transfected with an expression vector containing a selectable gene for mammalian cells.

Features:

- **Strong, Constitutive Expression:** The pSI Vector's SV40 enhancer/promoter region allows strong, constitutive expression in most cell lines. The vector is maintained as an episome in cells expressing the SV40 large T antigen, leading to even higher levels of expression. A β-globin/IgG chimeric intron located downstream from the enhancer/promoter region can further increase expression.
- **Increased Steady-State mRNA Levels:** The late SV40 polyadenylation signal increases the steady-state level of RNA approximately fivefold more than the early SV40 polyadenylation signal.
- **Convenient:** Multiple cloning sites exist for easy insertion of cDNA.
- **Versatile:** Synthesize transcripts in vitro using the T7 RNA polymerase promoter or generate single-stranded DNA in *E. coli* using the f1 origin of replication.

Storage Conditions: Store at –20°C.



pCI Mammalian Expression Vector

Product	Size	Cat.#
pCI Mammalian Expression Vector	20 µg	E1731

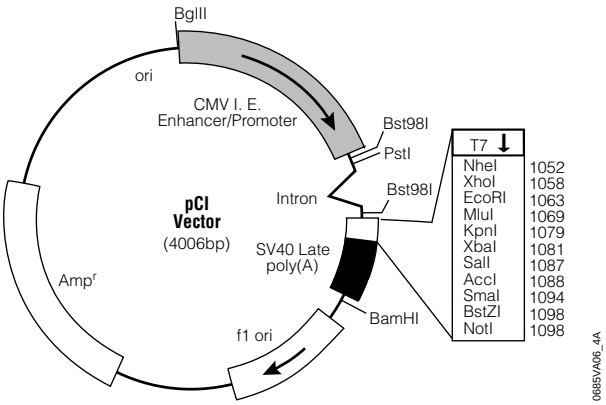
For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The pCI Mammalian Expression Vector promotes constitutive expression of cloned DNA inserts in mammalian cells. The major difference between the pCI and pSI Mammalian Expression Vectors is the enhancer/promoter region controlling expression of the inserted gene. The pCI Expression Vector contains the human cytomegalovirus (CMV) major immediate-early gene enhancer/promoter region. This vector can be used for both transient and stable expression of genes. For stable expression, the pCI Vector must be co-transfected with an expression vector containing a selectable gene for mammalian cells.

Features:

- **Strong, Constitutive Expression:** The pCI Vector's CMV enhancer/promoter region enables strong, constitutive expression in many cell types. A β-globin/IgG chimeric intron located downstream of the enhancer/promoter region can further increase expression.
- **Increased Steady-State mRNA Levels:** The late SV40 polyadenylation signal increases the steady-state level of RNA approximately fivefold more than the early SV40 polyadenylation signal.
- **Convenient:** Multiple cloning sites exist for easy insertion of cDNA.
- **Versatile:** Synthesize transcripts in vitro using the T7 RNA polymerase promoter or generate single-stranded DNA in *E. coli* using the f1 origin of replication.

Storage Conditions: Store at –20°C.



pCI-neo Mammalian Expression Vector

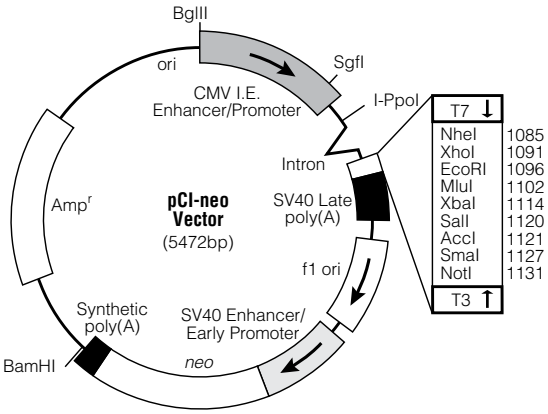
Product	Size	Cat.#
pCI-neo Mammalian Expression Vector	20 µg	E1841
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pCI-neo Mammalian Expression Vector carries the human cytomegalovirus (CMV) immediate-early enhancer/promoter region to promote constitutive expression of cloned DNA inserts in mammalian cells. This vector also contains the neomycin phosphotransferase gene, a selectable marker for mammalian cells. The pCI-neo Vector can be used for transient or stable expression by selecting transfected cells with the antibiotic G-418.

Features:

- **Strong, Constitutive Expression:** The human cytomegalovirus (CMV) immediate-early enhancer/promoter region produces strong, constitutive expression. A β-globin/IgG chimeric intron located downstream from the enhancer/promoter region can further increase expression. The vector is maintained as an episome in cells expressing the SV40 large T antigen, leading to even higher levels of expression.
- **Transient or Stable Expression:** The neomycin phosphotransferase gene allows selection of stable transfected cells.
- **Increased Steady-State mRNA Levels:** The late SV40 polyadenylation signal increases the steady-state level of RNA approximately fivefold more than the early SV40 polyadenylation signal.
- **Convenient:** Multiple cloning sites exist for easy insertion of cDNA.
- **Versatile:** Synthesize transcripts in vitro using the T7 RNA polymerase promoter or generate single-stranded DNA in *E. coli* using the f1 origin of replication.

Storage Conditions: Store at –20°C.



Cell-Free Expression Vectors

In Vitro Translation Specialty Vectors

Product	Size	Cat.#
pF3A WG (BYDV) Flexi® Vector	20 µg	L5671
pF3K WG (BYDV) Flexi® Vector	20 µg	L5681
pF25A ICE T7 Flexi® Vector	20 µg	L1061
pF25K ICE T7 Flexi® Vector	20 µg	L1081
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The Flexi® Vector System is a simple, yet powerful, directional cloning method for protein-coding sequences. It is based on two rare-cutting restriction enzymes, SgfI and PmeI, and provides a rapid, efficient and high-fidelity way to transfer protein-coding regions between a variety of Flexi® Vectors without the need to resequence.

The vectors are designed with special sequences for maximal cell-free protein expression in a specific system. The pF3A/K WG vectors were designed for use with Wheat Germ extracts and contain sequences from the barley yellow dwarf virus (BYDV), an RNA plant virus, upstream and downstream of the protein coding region of interest. The BYDV elements interact with each other, form a closed loop and act synergistically to stimulate translation in wheat germ extracts, bypassing mRNA cap and polyadenylation dependencies. The pF25A/K ICE Vectors were designed for use with Insect Cell Extracts and contain untranslated region (UTR) sequences at the 5′ and 3′ ends of the gene coding region to enhance translation efficiency.

Note: Flexi® Vectors contain the lethal barnase gene to reduce background colonies without inserts during the subcloning procedure. Using the Flexi® Vector Cloning System replaces the barnase gene with your insert. These vectors, as purchased, cannot be cultured in normal laboratory strains of *E. coli* without an insert.

Features:

- **Versatility:** You can choose between a variety of initial applications (e.g., bacterial protein, mammalian, or cell-free protein expression) and then transfer to others as required.
- **Time Savings:** Efficient transfer allows for direct use of recombinant clones, minimizing time wasted screening background colonies.
- **Enhanced Productivity:** Adaptable to high-throughput formats for large screening projects.
- **Easy Access:** No licensing fees or complicated transfer restrictions.

Storage Conditions: Store vectors at –20°C.

pTNT™ Vector

Product	Size	Cat.#
pTNT™ Vector	20 µg	L5610
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pTNT™ Vector is designed for the convenient in vitro expression of cloned genes. Both SP6 and T7 polymerase promoters lie in tandem adjacent to the multiple cloning site. This permits gene expression from either an SP6- or T7-based coupled in vitro transcription/translation system. The presence of RNA phage promoters also allows for the highly efficient synthesis of RNA in vitro. The pTNT™ Vector also contains a 5′ β-globin leader sequence and synthetic poly(A)$_{30}$ tail, both of which have been shown to enhance expression of certain genes.

Features:

- **Flexible:** The vector contains tandem SP6 and T7 phage promoters allowing use in the appropriate in vitro translation or transcription system.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store at –20°C.

Available in the Helix® on-site stocking system

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pCMVTNT™ Vector

Product	Size	Cat.#
pCMVTNT™ Vector	20 µg	L5620
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: The pCMVTNT™ Vector is designed for the convenient expression of cloned genes using both in vivo and in vitro expression systems. Both SP6 and T7 polymerase promoters lie in tandem adjacent to the multiple cloning site. This allows for gene expression from either an SP6- or T7-based coupled in vitro transcription/translation system. The presence of RNA phage promoters also allows for the highly efficient synthesis of RNA in vitro. The pCMVTNT™ Vector also contains a 5′ β-globin leader sequence that has been referenced for enhanced expression of certain genes in vitro. For in vivo expression, the vector contains a CMV enhancer/promoter region, which allows strong constitutive expression in many cell types. A β-globin/IgG chimeric intron is located downstream from the enhancer/promoter region. The late SV40 polyadenylation site is located downstream of the multiple cloning site.

Features:

- **In Vivo Expression:** The CMV enhancer/promoter region allows strong constitutive expression in many cell types.
- **Flexible:** The vector contains tandem SP6 and T7 phage promoters allowing use in the appropriate in vitro translation or transcription system.
- **Convenient:** Multiple cloning site provides a selection of restriction sites for cloning.

Storage Conditions: Store at –20°C.

Reporter Vectors

NanoLuc® Luciferase Technology

Product	Size	Cat.#
pNL1.1[*Nluc*] Vector	20 µg	N1001
pNL1.2[*NlucP*] Vector	20 µg	N1011
pNL1.3[*secNluc*] Vector	20 µg	N1021
pNL3.1[*Nluc*/minP] Vector	20 µg	N1031
pNL3.2[*NlucP*/minP] Vector	20 µg	N1041
pNL3.3[*secNluc*/minP] Vector	20 µg	N1051
pNL2.1[*Nluc*/Hygro] Vector	20 µg	N1061
pNL2.2[*NlucP*/Hygro] Vector	20 µg	N1071
pNL2.3[*secNluc*/Hygro] Vector	20 µg	N1081
pNL1.1.CMV[*Nluc*/CMV] Vector	20 µg	N1091
pNL1.3.CMV[*secNluc*/CMV] Vector	20 µg	N1101
pNL3.2.NF-κB-RE[*NlucP*/NF-κB-RE/Hygro]	20 µg	N1111
For Research Use Only. Not for Use in Diagnostic Procedures.		

Description: NanoLuc® (Nluc) luciferase is a small enzyme (19.1kDa) engineered for optimal performance as a luminescent reporter. The enzyme is about 100-fold brighter than either firefly (*Photinus pyralis*) or *Renilla reniformis* luciferase using a novel substrate, furimazine, to produce high intensity, glow-type luminescence. The luminescent reaction is ATP-independent and designed to suppress background luminescence for maximal assay sensitivity.

For use as a genetic reporter, multiple forms of NanoLuc® luciferase have been configured to meet differing experimental objectives. Unfused Nluc offers maximal light output and sensitivity, NanoLuc®-PEST (NlucP) closely couples protein expression to changes in transcriptional activity and increased signal-to background ratios, and NanoLuc® luciferase fused to an N-terminal secretion signal (secNluc) is suitable when a secreted reporter is preferred. Luminescence is linearly proportional to the amount of NanoLuc® protein over a 1,000,000-fold concentration range, with a signal half-life ≥2 hours when detected with Nano-Glo® Luciferase Assay Reagent.

NanoLuc® luciferase possesses a number of physical properties that make it an excellent reporter protein:

- very small, monomeric enzyme (171 amino acids; 513bp)
- high thermal stability (T_m = 60°C)
- active over a broad pH range (pH 6–8)
- no post-translational modifications or disulfide bonds
- uniform distribution in cells
- emission spectrum well suited for bioluminescence resonance energy transfer (BRET; λmax = 465nM).

NanoLuc® Luciferase is made available in a variety of plasmids designed for use in reporter gene assays of transcriptional control and with each of the NanoLuc® forms (unfused Nluc, PEST destabilized NlucP, and secreted secNluc). The different pNL variations are designed for the following:

- pNL1: cloning of a known or putative promoter region
- pNL2: cloning of a known or putative promoter region and establishment of a stable cell line through Hygromycin selection
- pNL3: cloning of a binding site or response element not in need of a basic promoter (such as are present in the pNL3.2.NF-κB-RE vector)
- Control plasmids for the unfused and secreted Nluc forms also are available. The pNL vectors series use a pGL4-based backbone for easy sequence transfer from existing plasmids. This backbone design also reduces anomalous results by removing many transcription factor binding sites and other potential regulatory elements. The Nluc gene variations are codon optimized and have had many potential regulatory elements or other undesirable features removed (such as common restriction enzyme sites).

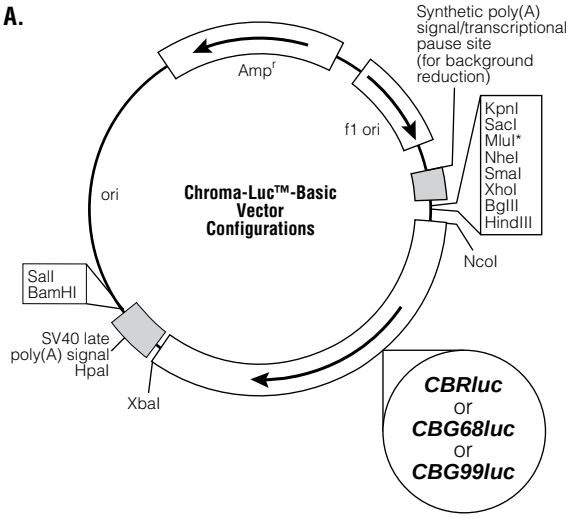
Storage Conditions: Store at –20°C.

Chroma-Luc™ Vectors

Product	Size	Cat.#
pCBR-Basic Vector	20 µg	E1411
pCBR-Control Vector	20 µg	E1421
pCBG68-Basic Vector	20 µg	E1431
pCBG68-Control Vector	20 µg	E1441
pCBG99-Basic Vector	20 µg	E1451
pCBG99-Control Vector	20 µg	E1461
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 335.

A.



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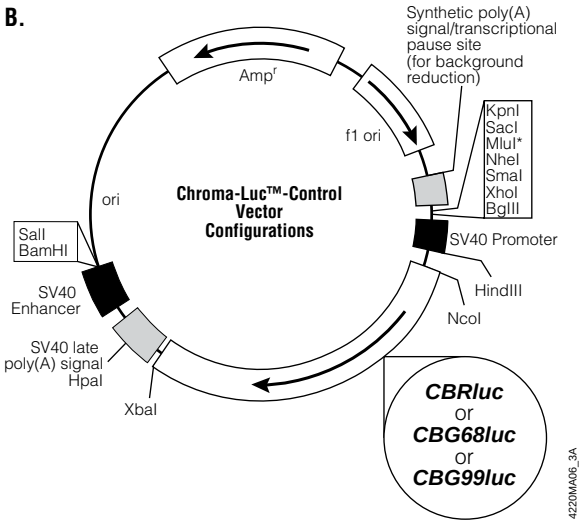

The Chroma-Luc™-Basic and -Control Vectors. These vectors contain *CBRluc* or *CBG68luc* or *CBG99luc*; Amp^r, a gene conferring ampicillin resistance in *E. coli*; ori, origin of plasmid replication in *E. coli*. Arrows within the Chroma-Luc™ and Amp^r genes indicate the direction of functionality.

* MluI should not be used in the vector configuration containing *CBG99luc*, as this gene also contains the MluI site.

pGL4 Luciferase Reporter Vectors

Promoter-Driven Control Firefly and *Renilla* Luciferase Vectors

Product	Size	Cat.#
pGL4.50[*luc2*/CMV/Hygro] Vector	20 µg	E1310
pGL4.51[*luc2*/CMV/Neo] Vector	20 µg	E1320
pGL4.13[*luc2*/SV40] Vector	20 µg	E6681
pGL4.73[*hRluc*/SV40] Vector	20 µg	E6911
pGL4.74[*hRluc*/TK] Vector	20 µg	E6921
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.75[*hRluc*/CMV] Vector	20 µg	E6931
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 332.

Promoterless Firefly Luciferase Vectors

Product	Size	Cat.#
pGL4.10[*luc2*] Vector	20 µg	E6651
pGL4.11[*luc2P*] Vector	20 µg	E6661
pGL4.12[*luc2CP*] Vector	20 µg	E6671
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.14[*luc2*/Hygro] Vector	20 µg	E6691
pGL4.15[*luc2P*/Hygro] Vector	20 µg	E6701
pGL4.16[*luc2CP*/Hygro] Vector	20 µg	E6711
pGL4.17[*luc2*/Neo] Vector	20 µg	E6721
pGL4.18[*luc2P*/Neo] Vector	20 µg	E6731
pGL4.19[*luc2CP*/Neo] Vector	20 µg	E6741
pGL4.20[*luc2*/Puro] Vector	20 µg	E6751
pGL4.21[*luc2P*/Puro] Vector	20 µg	E6761
pGL4.22[*luc2CP*/Puro] Vector	20 µg	E6771
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 333.

Available in the Helix® on-site stocking system

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Promoterless *Renilla* Luciferase Vectors

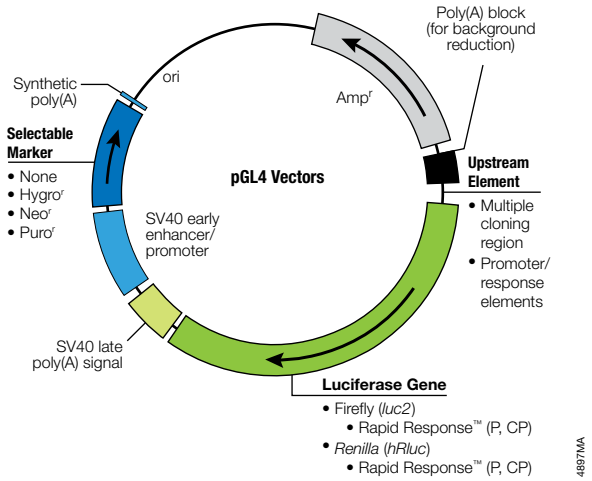
Product	Size	Cat.#
pGL4.70[*hRluc*] Vector	20 µg	E6881
pGL4.71[*hRlucP*] Vector	20 µg	E6891
pGL4.72[*hRlucCP*] Vector	20 µg	E6901
pGL4.76[*hRluc*/Hygro] Vector	20 µg	E6941
pGL4.23[*luc2*/minP] Vector	20 µg	E8411
pGL4.24[*luc2P*/minP] Vector	20 µg	E8421
pGL4.77[*hRlucP*/Hygro] Vector	20 µg	E6951
pGL4.78[*hRlucCP*/Hygro] Vector	20 µg	E6961
pGL4.79[*hRluc*/Neo] Vector	20 µg	E6971
pGL4.80[*hRlucP*/Neo] Vector	20 µg	E6981
pGL4.81[*hRlucCP*/Neo] Vector	20 µg	E6991
pGL4.82[*hRluc*/Puro] Vector	20 µg	E7501
pGL4.83[*hRlucP*/Puro] Vector	20 µg	E7511
pGL4.84[*hRlucCP*/Puro] Vector	20 µg	E7521
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 333.

Nuclear Receptor Analysis Luciferase Vectors

Product	Size	Cat.#
pGL4.36[*luc2P*/MMTV/Hygro] Vector	20 µg	E1360
pFN26A (BIND) *hRluc*-neo Flexi® Vector	20 µg	E1380
pBIND-ERα Vector	20 µg	E1390
pBIND-GR Vector	20 µg	E1581
pGL4.35[*luc2P*/9X*GAL4*UAS/Hygro] Vector	20 µg	E1370
GloResponse™ 9X*GAL4*UAS-*luc2P* HEK293 Cell Line	2 vials	E8530
For Research Use Only. Not for Use in Diagnostic Procedures.		

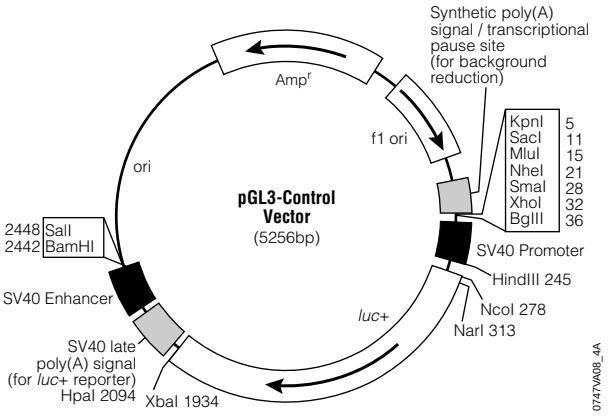
For additional information see page 334.



pGL3 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL3-Basic Vector	20 µg	E1751
pGL3-Control Vector	20 µg	E1741
pGL3-Enhancer Vector	20 µg	E1771
pGL3-Promoter Vector	20 µg	E1761
For Research Use Only. Not for Use in Diagnostic Procedures.		

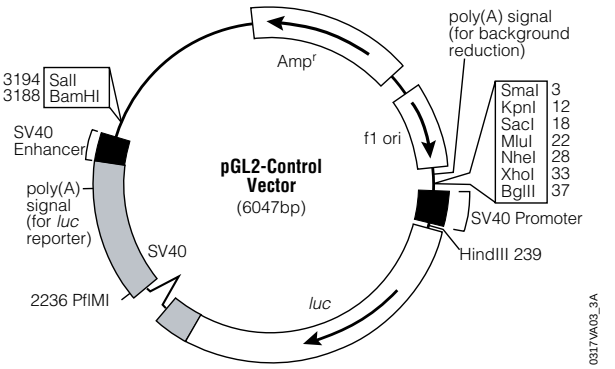
For additional information see page 336.



pGL2 Luciferase Reporter Vectors

Product	Size	Cat.#
pGL2-Basic Vector	20 µg	E1641
pGL2-Control Vector	20 µg	E1611
pGL2-Enhancer Vector	20 µg	E1621
pGL2-Promoter Vector	20 µg	E1631
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 337.



pmirGLO Dual-Luciferase miRNA Target Expression Vector

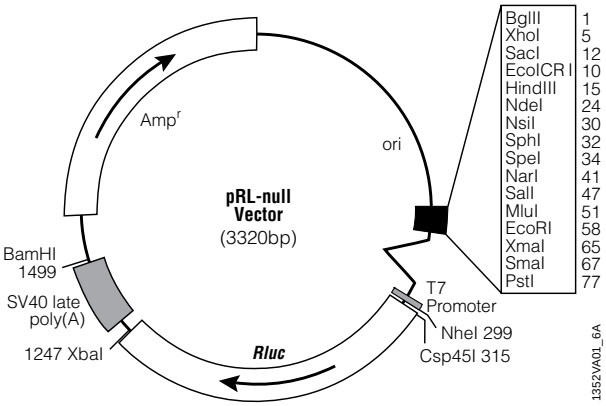
Product	Size	Cat.#
pmirGLO Dual-Luciferase miRNA Target Expression Vector	20 µg	E1330
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 335.

pRL *Renilla* Luciferase Control Reporter Vectors

Product	Size	Cat.#
pRL-SV40 Vector	20 µg	E2231
pRL-TK Vector	20 µg	E2241
pRL-CMV Vector	20 µg	E2261
pRL-null Vector	20 µg	E2271
For Research Use Only. Not for Use in Diagnostic Procedures.		

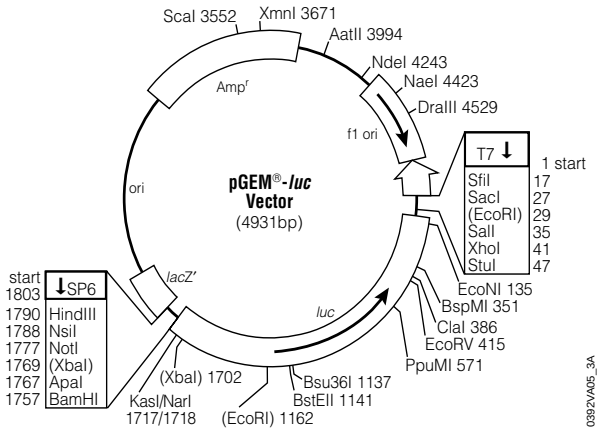
For additional information see page 336.



pGEM®-*luc* DNA

Product	Size	Cat.#
pGEM®-*luc* DNA	20 µg	E1541
For Research Use Only. Not for Use in Diagnostic Procedures.		

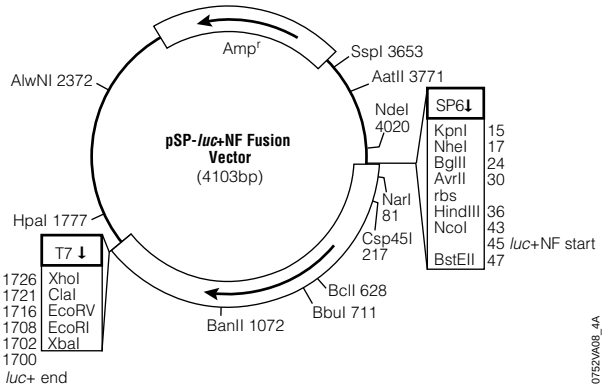
For additional information see page 337.



pSP-*luc*+NF Fusion Vector

Product	Size	Cat.#
pSP-*luc*+NF Fusion Vector	20 µg	E4471
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 340.



Available in the Helix® on-site stocking system

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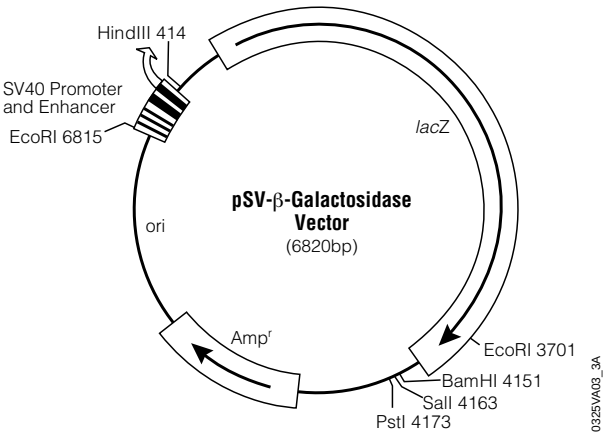
pSV-β-Galactosidase Control Vector

Product	Size	Cat.#
pSV-β-Galactosidase Control Vector	20 µg	E1081
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 340.



pCAT™3 Vectors

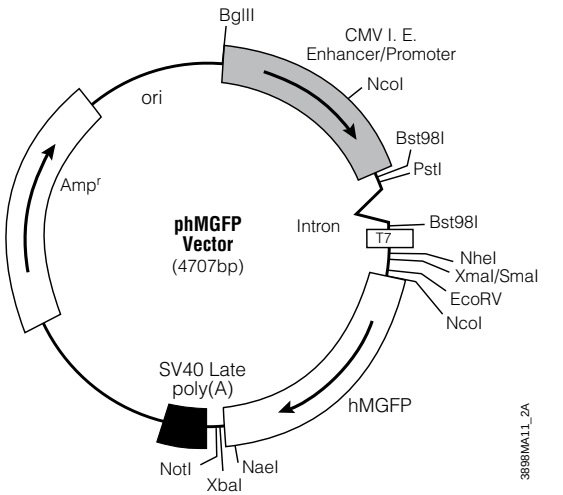
Product	Size	Cat.#
pCAT™3-Basic Vector	20 µg	E1871
pCAT™3-Control Vector	20 µg	E1851
pCAT™3-Enhancer Vector	20 µg	E1881
pCAT™3-Promoter Vector	20 µg	E1861
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 341.

Monster Green® Fluorescent Protein phMGFP Vector

Product	Size	Cat.#
Monster Green® Fluorescent Protein phMGFP Vector	20 µg	E6421
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 341.



Subcloning and Transcription Vectors

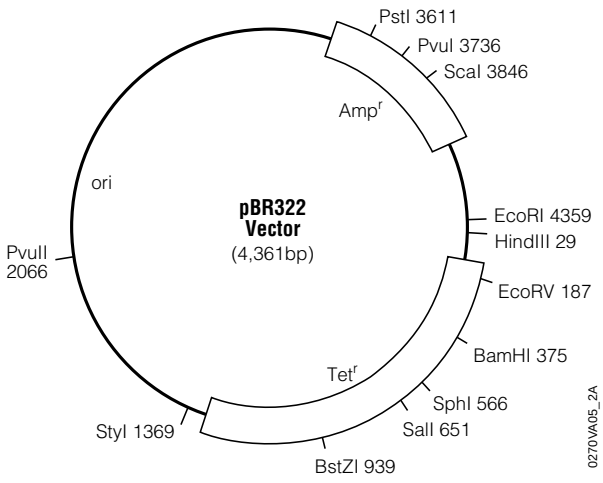
pBR322 Vector

Product	Size	Conc.	Cat.#
pBR322 Vector	10 µg	1 µg/µl	D1511

For Research Use Only. Not for Use in Diagnostic Procedures.

Description: The plasmid pBR322 Vector (4,361bp) carries the genes for tetracycline and ampicillin resistance. pBR322 DNA digests typically are used as molecular weight size markers in gel analysis of nucleic acids.

Storage Conditions: Store at –20°C.

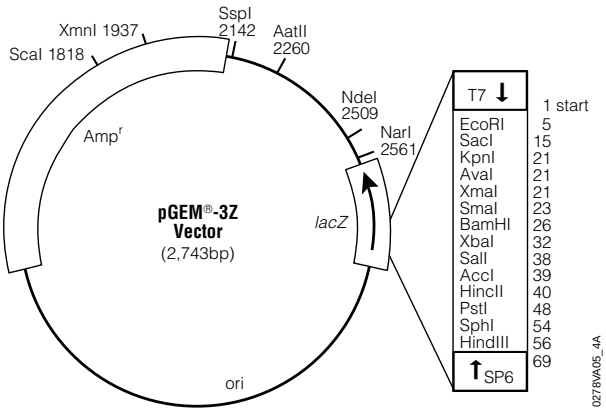


pGEM®-3Z Vector

Product	Size	Cat.#
pGEM®-3Z Vector	20 µg	P2151

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 134.

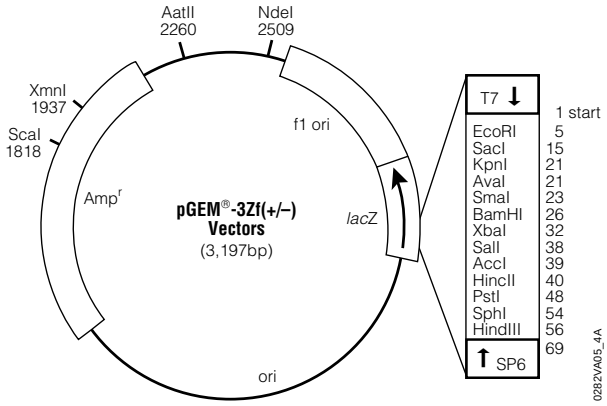


pGEM®-3Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-3Zf(+) Vector	20 µg	P2271
pGEM®-3Zf(–) Vector	20 µg	P2261

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 135.

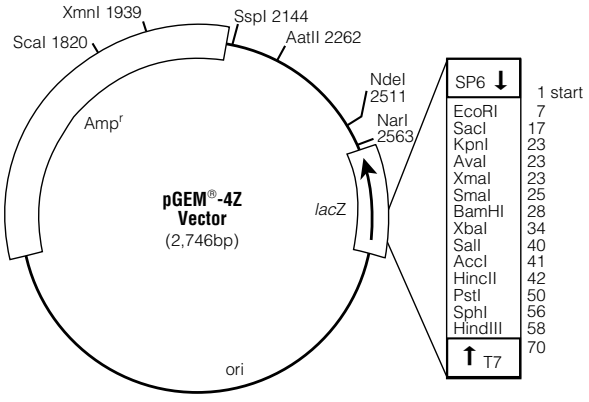


pGEM®-4Z Vector

Product	Size	Cat.#
pGEM®-4Z Vector	20 µg	P2161

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 135.



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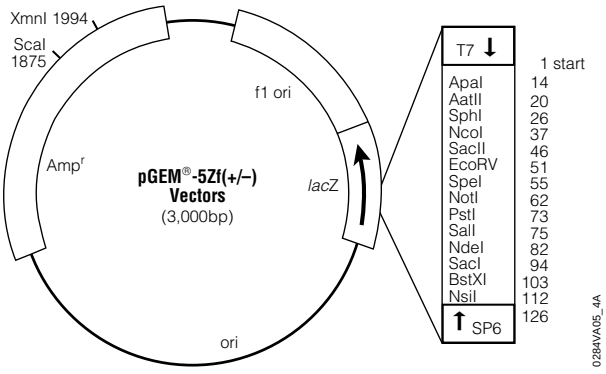
pGEM®-5Zf(+) Vector

Product	Size	Cat.#
pGEM®-5Zf(+) Vector	20 µg	P2241

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 136.

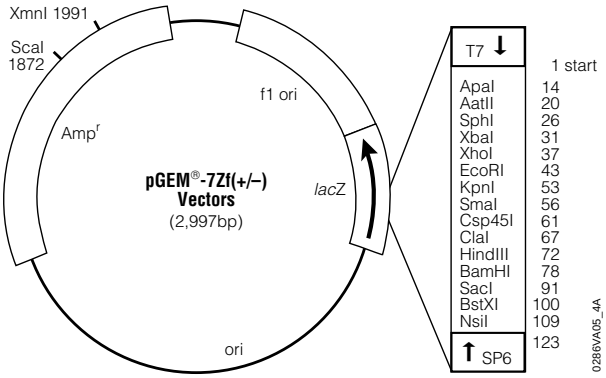


pGEM®-7Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-7Zf(+) Vector	20 µg	P2251
pGEM®-7Zf(–) Vector	20 µg	P2371

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 136.

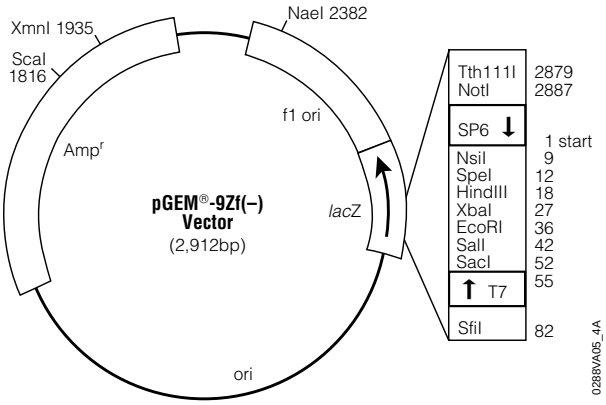


pGEM®-9Zf(–) Vector

Product	Size	Cat.#
pGEM®-9Zf(–) Vector	20 µg	P2391

For Research Use Only. Not for Use in Diagnostic Procedures.

For additional information see page 137.



pGEM®-11Zf(+/–) Vectors

Product	Size	Cat.#
pGEM®-11Zf(+) Vector	20 µg	P2411
pGEM®-11Zf(–) Vector	20 µg	P2421

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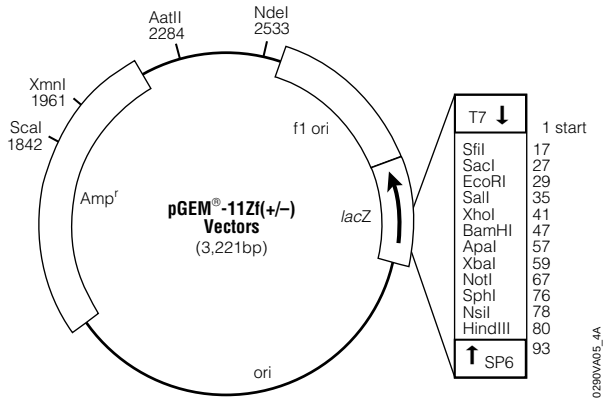
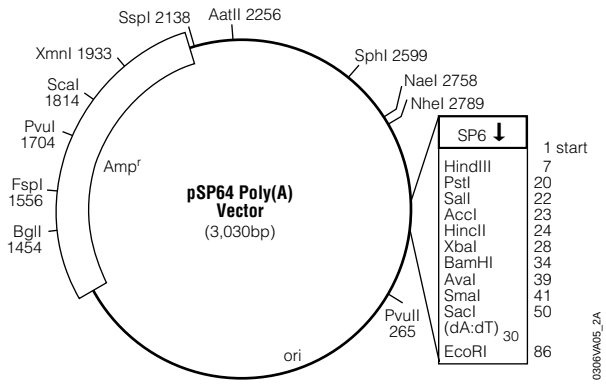
For additional information see page 137.



pSP64 Poly(A) Vector

Product	Size	Cat.#
pSP64 Poly(A) Vector	20 µg	P1241
For Research Use Only. Not for Use in Diagnostic Procedures.		

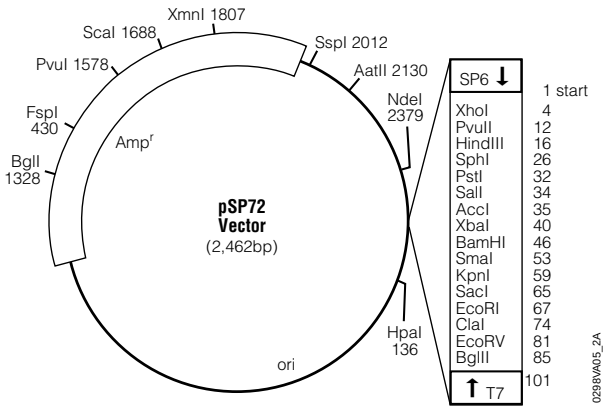
For additional information see page 138.



pSP72 Vector

Product	Size	Cat.#
pSP72 Vector	20 µg	P2191
For Research Use Only. Not for Use in Diagnostic Procedures.		

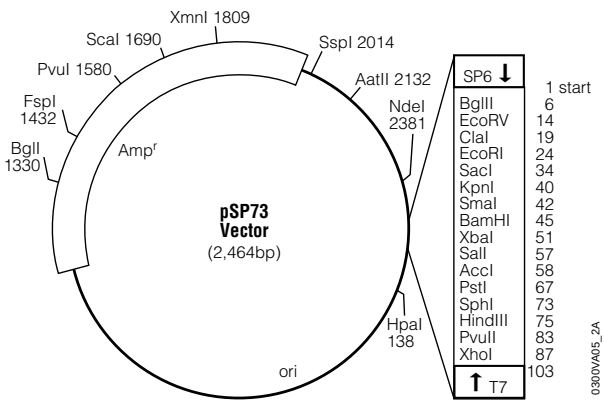
For additional information see page 138.



pSP73 Vector

Product	Size	Cat.#
pSP73 Vector	20 µg	P2221
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 139.



pUC/M13 Sequencing Primers

Product	Size	Conc.	Cat.#
pUC/M13 Primer, Forward (17mer)	2 µg	10 µg/ml	Q5391
pUC/M13 Primer, Reverse (17mer)	2 µg	10 µg/ml	Q5401
pUC/M13 Primer, Reverse (22mer)	2 µg	10 µg/ml	Q5421
pUC/M13 Primer, Forward (24mer)	2 µg	10 µg/ml	Q5601
For Research Use Only. Not for Use in Diagnostic Procedures.			

Description: The pUC/M13 Primers are designed for sequencing inserts cloned into the M13 vectors and pUC plasmids developed by Messing. These primers also can be used for sequencing other *lac*Z-containing plasmids such as the pGEM®-Z and pGEM®-Zf Vectors. The primers are purified by gel electrophoresis or HPLC.

Primer Sequences

- Forward (17mer): 5′-d(GTTTTCCCAGTCACGAC)-3′
- Reverse (17mer): 5′-d(CAGGAAACAGCTATGAC)-3′
- Reverse (22mer): 5′-d(TCACACAGGAAACAGCTATGAC)-3′
- Forward (24mer): 5′-d(CGCCAGGGTTTTCCCAGTCACGAC)-3′

Storage Conditions: Store at –20°C. The primers are supplied in sterile water.

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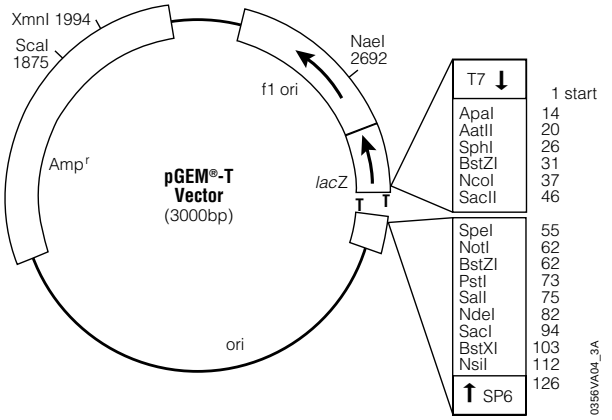
T Vectors

pGEM®-T Vector Systems

Product	Size	Cat.#
pGEM®-T Vector System I	20 reactions	A3600
pGEM®-T Vector System II	20 reactions	A3610
For Research Use Only. Not for Use in Diagnostic Procedures.		

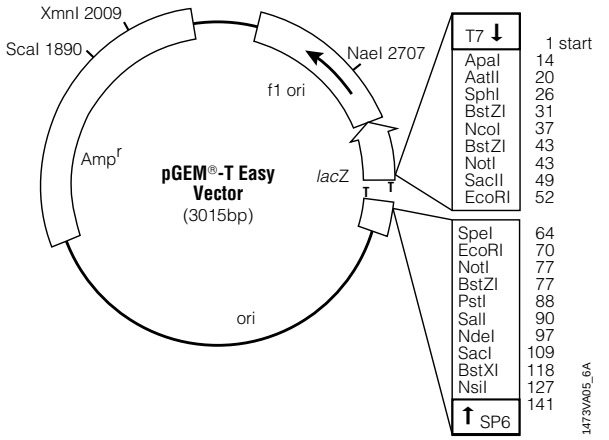
For additional information see page 280.



pGEM®-T Easy Vector Systems

Product	Size	Cat.#
pGEM®-T Easy Vector System I	20 reactions	A1360
pGEM®-T Easy Vector System II	20 reactions	A1380
For Research Use Only. Not for Use in Diagnostic Procedures.		

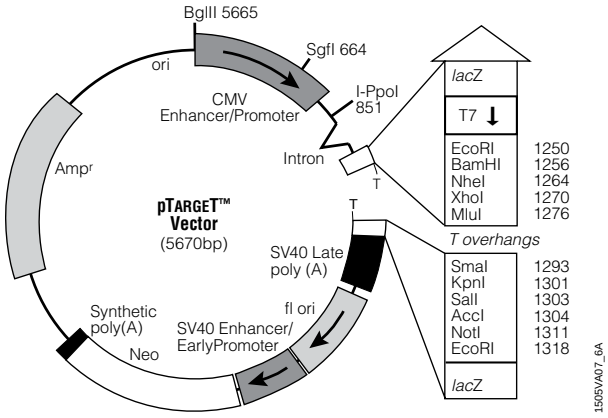
For additional information see page 281.



pTARGET™ Mammalian Expression Vector System

Product	Size	Cat.#
pTARGET™ Mammalian Expression Vector System	20 reactions	A1410
For Research Use Only. Not for Use in Diagnostic Procedures.		

For additional information see page 282.



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Products tagged with the Helix® icon are available for distribution through our convenient on-site stocking program in a freezer, refrigerated unit or an ambient cabinet.

For more information visit: **www.promega.com/helix**

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A1125	Wizard® Genomic DNA Purification Kit	500 isolations × 300 µl	5, 148
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A1250	Access RT-PCR System	100 reactions	276
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A1280	Access RT-PCR System	500 reactions	276
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A1318	Column Wash Solution (CWA)	370 ml	159
A1330	Wizard® *Plus* SV Minipreps DNA Purification System	50 preps	154
A1331	Vacuum Adapters	20 each	142, 154, 174
A1340	Wizard® *Plus* SV Minipreps DNA Purification System + Vacuum Adapters	50 preps	154
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A1511	Promega 10F Barrier Tips, 960/pk	0.5–10 µl	26
A1521	Promega 20 Barrier Tips, 960/pk	2–20 µl	26
A1541	Promega 100 Barrier Tips, 960/pk	10–100 µl	26
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G5381	Vitronectin, Human	100 µg	23
G5421	CellTiter 96® AQ_{ueous} Non-Radioactive Cell Proliferation Assay	1,000 assays	61
G5430	CellTiter 96® AQ_{ueous} Non-Radioactive Cell Proliferation Assay	5,000 assays	61
G5440	CellTiter 96® AQ_{ueous} Non-Radioactive Cell Proliferation Assay	50,000 assays	61
G5631	rhLung β Tryptase	100 µg	184

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G5961	Caspase Inhibitor Ac-DEVD-CHO	100 µl	56
G6050	HaloTag® Cloning Starter System	1 each	131, 298, 300, 301
G6080	CellTiter-Fluor™ Cell Viability Assay	10 ml	60
G6081	CellTiter-Fluor™ Cell Viability Assay	5 × 10 ml	60
G6082	CellTiter-Fluor™ Cell Viability Assay	2 × 50 ml	60
G6190	HaloLink™ Array Six Slide System	6 slides	310
G6260	DUB-Glo™ Protease Assay (DUB/SENP/NEDP)	10 ml	180, 194
G6261	DUB-Glo™ Protease Assay (DUB/SENP/NEDP)	50 ml	180, 194
G6270	HaloTag® Protein Purification System Sample Pack	1 each	197, 306
G6280	HaloTag® Protein Purification System	1 each	197, 306
G6320	ApoTox-Glo™ Triplex Assay	10 ml	50, 65, 195
G6321	ApoTox-Glo™ Triplex Assay	5 × 10 ml	50, 65, 195
G6410	ApoLive-Glo™ Multiplex Assay	10 ml	50
G6411	ApoLive-Glo™ Multiplex Assay	5 × 10 ml	50
G6420	HDAC-Glo™ I/II Assay	10 ml	81, 193
G6421	HDAC-Glo™ I/II Assay	5 × 10 ml	81, 193
G6422	HDAC-Glo™ I/II Assay	100 ml	81, 193
G6430	HDAC-Glo™ I/II Screening System	10 ml	81, 193
G6431	HDAC-Glo™ I/II Screening System	5 × 10 ml	81, 193
G6450	SIRT-Glo™ Assay	10 ml	82, 194
G6451	SIRT-Glo™ Assay	5 × 10 ml	82, 194
G6452	SIRT-Glo™ Assay	100 ml	82, 194
G6460	SIRT-Glo™ Control Substrate	35 µl	82, 194
G6470	SIRT-Glo™ Screening System	10 ml	82, 194
G6471	SIRT-Glo™ Screening System	5 × 10 ml	82, 194
G6500	HaloTag® Mammalian Pull-Down and Labeling System	24 reactions	308
G6504	HaloTag® Mammalian Pull-Down System	24 reactions	308
G6509	HaloTag® Complete Pull-Down System	1 each	308
G6521	Protease Inhibitor Cocktail, 50X	1 ml	19, 196, 307, 308, 312
G6540	Nicotinamide	30 µl	82, 194
G6550	HDAC-Glo™ I/II Control Substrate	10 µl	81, 193
G6560	Trichostatin A	10 µl	81, 193
G6570	HeLa Nuclear Extract	10 µl	81, 82, 193, 194
G6591	HaloTag® Control Vector	20 µg	308
G6601	HaloTEV Protease	1,000 u	196, 307, 309
G6602	HaloTEV Protease	4,000 u	196, 307, 309
G6790	HaloTag® Mammalian Protein Purification System	1 each	196, 307
G6795	HaloTag® Mammalian Protein Detection and Purification System	1 each	196, 307
G6799	HaloTag® Mammalian Protein Detection and Purification System Sample Pack	1 each	196, 307
G6941	1kb DNA Step Ladder	90 µg	107
G6951	100bp DNA Step Ladder	100 µg	107
G6961	200bp DNA Step Ladder	100 µg	107
G7010	ADCC Reporter Bioassay, Core Kit	1 each	34
G7015	ADCC Reporter Bioassay, Complete (Raji)	1 each	32
G7016	ADCC Reporter Bioassay, Target (Raji)	1 each	32
G7018	ADCC Reporter Bioassay, Core Kit 5X	1 each	34
G7061	rhSkin β Tryptase	100 µg	184
G7102	ADCC Bioassay Effector Cells, Propagation Model	1 each	35
G7121	Anti-βIII Tubulin mAb	100 µg	230
G7130	DeadEnd™ Colorimetric TUNEL System	40 reactions	55
G7220	CaspACE™ Assay System, Colorimetric	100 assays	55
G7231	Caspase Inhibitor Z-VAD-FMK, 20mM	50 µl	56
G7232	Caspase Inhibitor Z-VAD-FMK, 20mM	125 µl	56
G7281	Magne™ HaloTag® Beads, 20% Slurry	1 ml	310
G7282	Magne™ HaloTag® Beads, 20% Slurry	5 ml	310
G7291	Protein G HaloTag® Fusion Protein	5 mg	310
G7341	Anti-PARP p85 Fragment pAb	50 µl	57, 229
G7351	CaspACE™ Assay System, Colorimetric	50 assays	55
G7360	DeadEnd™ Colorimetric TUNEL System	20 reactions	55
G7431	TMB One Solution	100 ml	231
G7441	Anti-pS^{473} Akt pAb	40 µl	222
G7451	Anti-Luciferase pAb	200 µg	227
G7461	CaspACE™ FITC-VAD-FMK In Situ Marker	50 µl	55
G7462	CaspACE™ FITC-VAD-FMK In Situ Marker	125 µl	55
G7471	Magne™ Protein G Beads, 20% Slurry	1 ml	312
G7472	Magne™ Protein G Beads, 20% Slurry	5 ml	312
G7473	Magne™ Protein G Beads, 20% Slurry	50 ml	312
G7481	Anti-ACTIVE® Caspase-3 pAb	50 µl	57, 226
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G7521	BenchTop pGEM® DNA Markers	250 µl	106
G7531	BenchTop PCR Markers	300 µl	106
G7541	BenchTop 1kb DNA Ladder	600 µl	106
G7570	CellTiter-Glo® Luminescent Cell Viability Assay	10 ml	58
G7571	CellTiter-Glo® Luminescent Cell Viability Assay	10 × 10 ml	58
G7572	CellTiter-Glo® Luminescent Cell Viability Assay	100 ml	58
G7573	CellTiter-Glo® Luminescent Cell Viability Assay	10 × 100 ml	58
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G7591	TGFβ_1 E_{max}® ImmunoAssay System	5 × 96 wells	221
G7610	BDNF E_{max}® ImmunoAssay System	2 × 96 wells	220
G7611	BDNF E_{max}® ImmunoAssay System	5 × 96 wells	220
G7620	GDNF E_{max}® ImmunoAssay System	2 × 96 wells	220
G7621	GDNF E_{max}® ImmunoAssay System	5 × 96 wells	220
G7630	NGF E_{max}® ImmunoAssay System	2 × 96 wells	221
G7631	NGF E_{max}® ImmunoAssay System	5 × 96 wells	221
G7711	pHTC HaloTag® CMV-neo Vector	20 µg	300
G7721	pHTN HaloTag® CMV-neo Vector	20 µg	301
G7781	Apo-ONE® Homogeneous Caspase-3/7 Buffer	100 ml	54
G7790	Apo-ONE® Homogeneous Caspase-3/7 Assay	10 ml	54
G7791	Apo-ONE® Homogeneous Caspase-3/7 Assay	100 ml	54
G7792	Apo-ONE® Homogeneous Caspase-3/7 Assay	1 ml	54
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G7941	Bio-Glo™ Luciferase Assay System	10 ml	30
G7971	pH6HTN His_6HaloTag® T7 Vector	20 µg	132, 302
G8000	Mitochondrial ToxGlo™ Assay	10 ml	74
G8001	Mitochondrial ToxGlo™ Assay	100 ml	74
G8031	pH6HTC His_6HaloTag® T7 Vector	20 µg	132, 302
G8080	CellTiter-Blue® Cell Viability Assay	20 ml	62
G8081	CellTiter-Blue® Cell Viability Assay	100 ml	62
G8082	CellTiter-Blue® Cell Viability Assay	10 × 100 ml	62
G8090	Caspase-Glo® 3/7 Assay	2.5 ml	52
G8091	Caspase-Glo® 3/7 Assay	10 ml	52
G8092	Caspase-Glo® 3/7 Assay	100 ml	52
G8093	Caspase-Glo® 3/7 Assay	10 × 10 ml	52
G8200	Caspase-Glo® 8 Assay	2.5 ml	53
G8201	Caspase-Glo® 8 Assay	10 ml	53
G8202	Caspase-Glo® 8 Assay	100 ml	53
G8210	Caspase-Glo® 9 Assay	2.5 ml	53
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G8212	Caspase-Glo® 9 Assay	100 ml	53
G8230	BacTiter-Glo™ Microbial Cell Viability Assay	10 ml	59, 237
G8231	BacTiter-Glo™ Microbial Cell Viability Assay	10 × 10 ml	59, 237
G8232	BacTiter-Glo™ Microbial Cell Viability Assay	100 ml	59, 237
G8233	BacTiter-Glo™ Microbial Cell Viability Assay	10 × 100 ml	59, 237
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G8252	HaloTag® TMR Ligand	15 µl	218, 298
G8261	pFN29A His_6HaloTag® T7 Flexi® Vector	20 µg	132, 302
G8272	HaloTag® diAcFAM Ligand	30 µl	218, 298
G8273	HaloTag® diAcFAM Ligand	15 µl	218, 298
G8281	HaloTag® Biotin Ligand	30 µl	218, 298
G8282	HaloTag® Biotin Ligand	15 µl	218, 298
G8291	BenchTop 100bp DNA Ladder	300 µl	106
G8321	pFC30A His_6HaloTag® T7 Flexi® Vector	20 µg	132, 302
G8331	pFN29K His_6HaloTag® T7 Flexi® Vector	20 µg	132, 302
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G8351	DPPIV-Glo™ Protease Assay	50 ml	181
G8381	pFC30K His_6HaloTag® T7 Flexi® Vector	20 µg	132, 302
G8421	pFC27A HaloTag® CMV-neo Flexi® Vector	20 µg	300
G8431	pFC27K HaloTag® CMV-neo Flexi® Vector	20 µg	300
G8441	pFN28A HaloTag® CMV-neo Flexi® Vector	20 µg	301
G8451	pFN28K HaloTag® CMV-neo Flexi® Vector	20 µg	301
G8461	CellTiter-Glo® One Solution Assay	100 ml	59
G8462	CellTiter-Glo® One Solution Assay	500 ml	59
G8471	HaloTag® Alexa Fluor® 660 Ligand	30 µl	218, 298
G8472	HaloTag® Alexa Fluor® 660 Ligand	15 µl	218, 298
G8501	Calpain-Glo™ Protease Assay	10 ml	183
G8502	Calpain-Glo™ Protease Assay	50 ml	183
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G8582	HaloTag® Coumarin Ligand	15 µl	218, 298
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G8621	Proteasome-Glo™ Chymotrypsin-Like Assay	10 ml	181
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G8631	Proteasome-Glo™ Trypsin-Like Assay	10 ml	181
G8632	Proteasome-Glo™ Trypsin-Like Assay	50 ml	181
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G8760	Proteasome-Glo™ Trypsin-Like Cell-Based Assay	10 ml	182
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G8782	Magne™ Protein A Beads, 20% Slurry	5 ml	312
G8783	Magne™ Protein A Beads, 20% Slurry	50 ml	312
G8820	ROS-Glo™ H_2O_2 Assay	10 ml	70
G8821	ROS-Glo™ H_2O_2 Assay	50 ml	70
G8860	Proteasome-Glo™ Caspase-Like Cell-Based Assay	10 ml	182
G8861	Proteasome-Glo™ Caspase-Like Cell-Based Assay	5 × 10 ml	182
G8941	Viral ToxGlo™ Assay	10 ml	62
G8942	Viral ToxGlo™ Assay	10 × 10 ml	62
G8943	Viral ToxGlo™ Assay	100 ml	62
G9061	NAD(P)H-Glo™ Detection System	10 ml	72
G9062	NAD(P)H-Glo™ Detection System	50 ml	72
G9071	NAD/NADH-Glo™ Assay	10 ml	72
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G9082	NADP/NADPH-Glo™ Assay	50 ml	73
G9200	MultiTox-Fluor Multiplex Cytotoxicity Assay	10 ml	64
G9201	MultiTox-Fluor Multiplex Cytotoxicity Assay	5 × 10 ml	64
G9202	MultiTox-Fluor Multiplex Cytotoxicity Assay	2 × 50 ml	64
G9211	Anti-HaloTag® Monoclonal Antibody	200 µg	227
G9260	CytoTox-Fluor™ Cytotoxicity Assay	10 ml	67
G9261	CytoTox-Fluor™ Cytotoxicity Assay	5 × 10 ml	67
G9262	CytoTox-Fluor™ Cytotoxicity Assay	2 × 50 ml	67
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G9291	CytoTox-Glo™ Cytotoxicity Assay	5 × 10 ml	66
G9292	CytoTox-Glo™ Cytotoxicity Assay	2 × 50 ml	66
G9381	Mammalian Lysis Buffer	40 ml	308
G9410	HaloCHIP™ System	20 reactions	311
G9441	Digitonin	40 µl	56
G9451	Protease-Glo™ Assay	1 each	180
G9461	pGloSensor™-10F Linear Vector	1 µg	180
G9651	pFC14A HaloTag® CMV Flexi® Vector	20 µg	298, 300, 311
G9661	pFC14K HaloTag® CMV Flexi® Vector	20 µg	298, 300, 311
H1181	Diamond™ Nucleic Acid Dye	500 µl	15
H5001	Boric Acid, Molecular Biology Grade	500 g	15
H5003	Boric Acid, Molecular Biology Grade	1 kg	15
H5031	EDTA, Disodium Salt, Molecular Biology Grade	100 g	16
H5032	EDTA, Disodium Salt, Molecular Biology Grade	500 g	16
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H5052	Formamide, Molecular Grade	500 ml	17
H5071	Glycine, Molecular Biology Grade	500 g	17
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H5113	Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS)	100 g	20
H5114	Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS)	500 g	20
H5115	Sodium Dodecyl Sulfate, Molecular Biology Grade (SDS)	1 kg	20
H5121	Tris-HCl, Molecular Biology Grade	100 g	22
H5123	Tris-HCl, Molecular Biology Grade	500 g	22
H5125	Tris-HCl, Molecular Biology Grade	2,500 g	22
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H5133	Tris Base, Molecular Biology Grade	100 g	22
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H5141	Triton® X-100, Molecular Biology Grade	500 ml	22
H5142	Triton® X-100, Molecular Biology Grade	100 ml	22
H5151	Tween® 20, Molecular Biology Grade	500 ml	22
H5152	Tween® 20, Molecular Biology Grade	100 ml	22
H5252	Ammonium Sulfate, Molecular Biology Grade	5 kg	13
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H5273	Sodium Chloride, Molecular Biology Grade	1 kg	20
H5302	HEPES, Molecular Biology Grade (free acid)	100 g	18
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K9981	Bacterial Strain LE392, Glycerol Stock	500 µl	139
L1001	JM109 Competent Cells, >10^7cfu/µg	1 ml	139
L1020	*E. coli* S30 Extract System for Circular DNA	30 reactions	290
L1030	*E. coli* S30 Extract System for Linear Templates	30 reactions	290
L1061	pF25A ICE T7 Flexi® Vector	20 µg	284, 367
L1081	pF25K ICE T7 Flexi® Vector	20 µg	284, 367
L1101	TnT® T7 Insect Cell Extract Protein Expression System	10 reactions	284
L1102	TnT® T7 Insect Cell Extract Protein Expression System	40 reactions	284
L1110	S30 T7 High-Yield Protein Expression System	24 reactions	289
L1115	S30 T7 High-Yield Protein Expression System	8 reactions	289
L1130	*E. coli* T7 S30 Extract System for Circular DNA	30 reactions	290
L1170	TnT® T7 Quick Coupled Transcription/ Translation System	40 reactions	285
L1171	TnT® T7 Quick Coupled Transcription/ Translation System, Trial Size	5 reactions	285
L1191	BL21(DE3)pLysS Competent Cells, >10^6cfu/µg	1 ml	139, 292
L1195	Single-Use BL21(DE3)pLysS Competent Cells	1 ml	139, 292
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L1215	TnT® T7 Quick Starter Bundle, Colorimetric	1 each	286
L1221	Single-Use Pro 5-alpha Competent Cells, >10^9cfu/µg	1 ml	139
L2001	JM109 Competent Cells, >10^8cfu/µg	1 ml	139
L2005	Single-Use JM109 Competent Cells, >10^8cfu/µg	1 ml	139
L2011	HB101 Competent Cells, >10^8cfu/µg	1 ml	139
L2015	Single-Use HB101 Competent Cells, >10^8cfu/µg	1 ml	139
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L3002	Single Step (KRX) Competent Cells	20 × 50 µl	139, 197, 291, 306
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L3261	TnT® SP6 High-Yield Wheat Germ Protein Expression System	10 reactions	284
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L4461	Amino Acid Mixture, Complete	175 µl	289
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L4601	TnT® SP6 Coupled Reticulocyte Lysate System, Trial Size	8 reactions	285
L4610	TnT® T7 Coupled Reticulocyte Lysate System	40 reactions	285
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L5010	TNT® T7/T3 Coupled Reticulocyte Lysate System	40 reactions	285
L5020	TNT® T7/SP6 Coupled Reticulocyte Lysate System	40 reactions	285
L5030	TNT® T7/SP6 Coupled Wheat Germ Extract System	40 reactions	286
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L9951	Amino Acid Mixture Minus Leucine	175 µl	289
L9961	Amino Acid Mixture Minus Methionine	175 µl	289
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M1060	Subcloning Tools Bundle	1 each	131
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M1875	Terminal Deoxynucleotidyl Transferase, Recombinant	1,500 u	129
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M3683	M-MLV Reverse Transcriptase, RNase H Minus, Point Mutant	50,000 u	278
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M4103	T4 Polynucleotide Kinase	1,000 u	127
M4211	T4 DNA Polymerase	100 u	125
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M4261	RNase ONE™ Ribonuclease	1,000 u	128
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M4285	Ribonuclease H	250 u	128
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M5123	GoTaq® Hot Start Green Master Mix	1,000 reactions	192, 264
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M5133	GoTaq® Hot Start Colorless Master Mix	1,000 reactions	192, 264
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M7405	GoTaq® G2 Hot Start Polymerase	500 u	264
M7406	GoTaq® G2 Hot Start Polymerase	2,500 u	264
M7408	GoTaq® G2 Hot Start Polymerase	10,000 u	264
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M7423	GoTaq® G2 Hot Start Green Master Mix	1,000 reactions	264
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M7433	GoTaq® G2 Hot Start Colorless Master Mix	1,000 reactions	264
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P4074	T7 RNA Polymerase (HC)	10,000 u	125
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P6751	HaloTag® Succinimidyl Ester (O4) Ligand	5 mg	219, 299
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U1245	Set of dATP, dCTP, dGTP, dUTP	40µmol each	269
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V7470	SignaTECT® Protein Kinase C (PKC) Assay System	96 reactions	99
V7480	SignaTECT® cAMP-Dependent Protein Kinase (PKA) Assay System	96 reactions	99
V7861	SAM^{2}® Biotin Capture Membrane	7.6 × 10.9 cm	99
V7870	SignaTECT® DNA-Dependent Protein Kinase Assay System	96 reactions	99
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V7932	Anti-ACTIVE® JNK pAb, Rabbit, (pTPpY)	120 µl	223
V7951	Donkey Anti-Rabbit IgG (H+L), HRP	60 µl	230
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V8051	Donkey Anti-Goat IgG, HRP	60 µl	231
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Cat#	Product	Size	Page
Z5210	PolyATtract® mRNA Isolation System I (Refill for Z5200)	3 isolations	165
Z5261	Biotinylated Oligo(dT) Probe (50pmol/µl)	35 µl	165
Z5300	PolyATtract® mRNA Isolation System III with Magnetic Stand	15 isolations	165
Z5310	PolyATtract® mRNA Isolation System IV (Refill for Z5300)	15 isolations	165
Z5331	MagneSphere® Technology Magnetic Separation Stand (two-position)	0.5 ml	174, 318
Z5332	MagneSphere® Technology Magnetic Separation Stand (two-position)	1.5 ml	165, 174, 318
Z5333	MagneSphere® Technology Magnetic Separation Stand (two-position)	12 × 75 mm	165, 174, 318
Z5341	MagneSphere® Technology Magnetic Separation Stand (twelve-position)	0.5 ml	174, 318
Z5342	MagneSphere® Technology Magnetic Separation Stand (twelve-position)	1.5 ml	174, 318
Z5343	MagneSphere® Technology Magnetic Separation Stand (twelve-position)	12 × 75 mm	174, 318
Z5400	PolyATtract® System 1000 without Magnetic Stand	Scal able	165
Z5410	PolyATtract® System 1000 Magnetic Separation Stand	1 each	165, 174, 318
Z5420	PolyATtract® System 1000 with Magnetic Stand	Scal able	165
Z5481	Streptavidin MagneSphere® Paramagnetic Particles	9 ml	165
Z5482	Streptavidin MagneSphere® Paramagnetic Particles	25 ml	165
Z5651	RNAgents® Denaturing Solution	120 ml	164
Z6010	ReliaPrep™ RNA Cell Miniprep System	10 preps	161
Z6011	ReliaPrep™ RNA Cell Miniprep System	50 preps	161
Z6012	ReliaPrep™ RNA Cell Miniprep System	250 preps	161
Z6110	ReliaPrep™ RNA Tissue Miniprep System	10 preps	161
Z6111	ReliaPrep™ RNA Tissue Miniprep System	50 preps	161
Z6112	ReliaPrep™ RNA Tissue Miniprep System	250 preps	161
Z7041	Streptavidin	1 mg	20

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