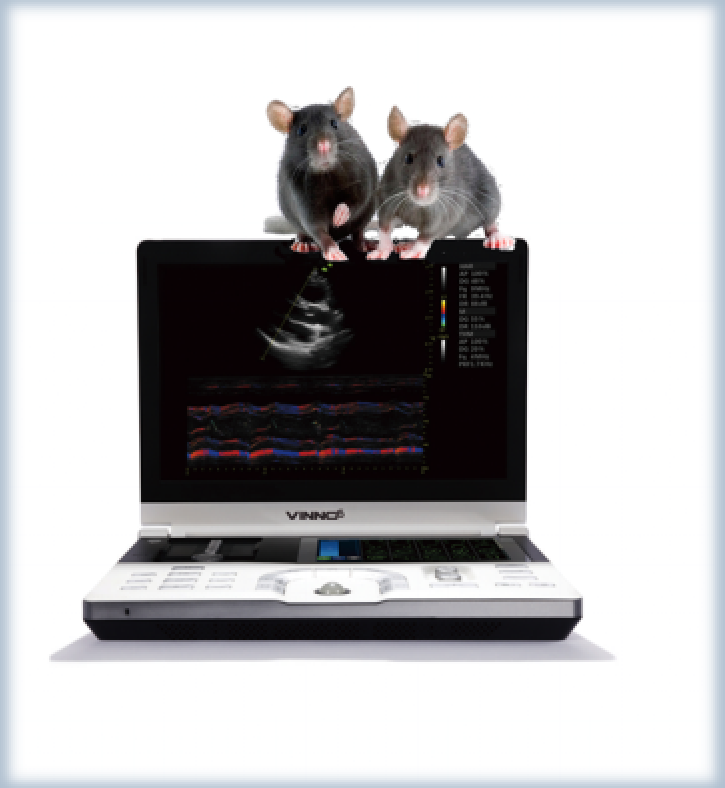
V6 Small Animals Ultrasound Imaging System

Yeeran Technology

01

V6 Appearance overview

World-class performance with a thinner and lighter design



Wide–angle Tilting Capability

•High resolution flat–panel display

with continuously adjustable positioning

•Wide viewing angle

Compact Construction

Weight: 3.5kg

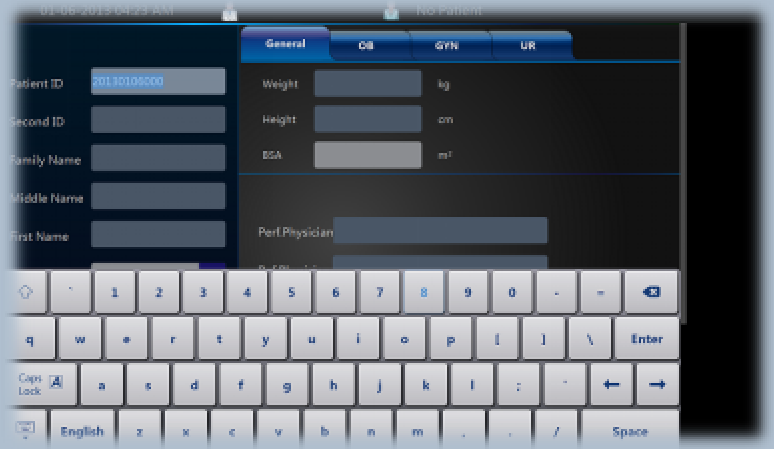
- ✓ Thinner and beauty
- ✓ Easy to carry by integrated handle

Probe connector

Integrated connector design saves space and adds compatibility across full range of VINNO scanner series

Keyboard：

Touch–screen QWERTY keyboard



Ergonomic Design

- 15.6 inch high resolution LED display
- 8-inch touch panel
- DICOM 3.0 compatibility
- 2USB ports
- Built-in battery for 1 hour independent operation
- 250GB SSD provides quick boot up and storage
- Supports optional BW or Color printer

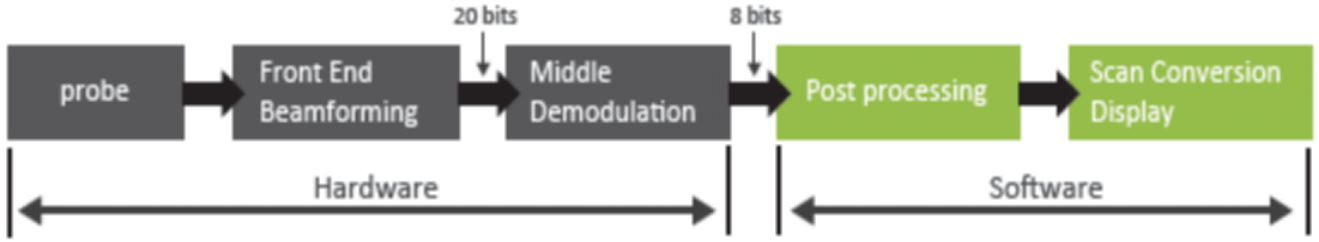
Compact, ergonomic design for intuitive workflow

Portable

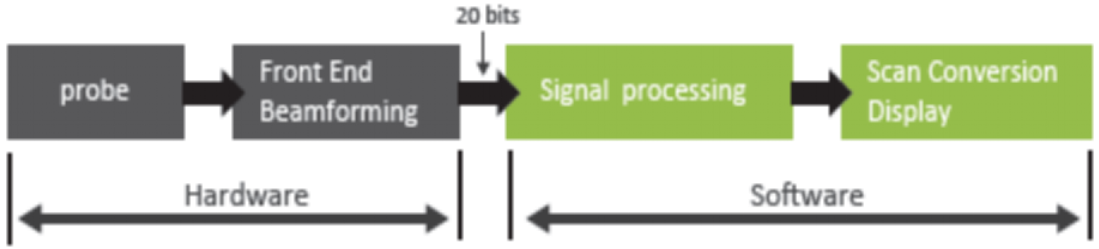
◆The portable model can be put into the trolley case and shuttled between the independent laboratories and BSL-3 ones.

Innovative RF Ultrasound Platform

Traditional Ultrasound Platform — Image data processing platform



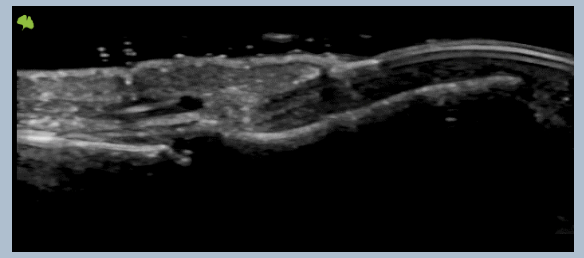
Innovative RF Ultrasound Platform
RF signal data processing platform for better resolution and definition



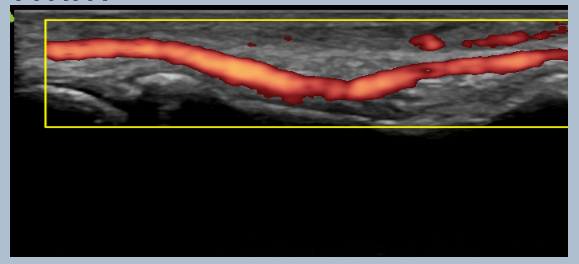
√ Bigger data to compute for better image quality.
√ Non-linear demodulation to strong signal.
√ More accurate and higher step calculation.

√ Processing algorithm based on signal data, not image data.
√ Flexible algorithm on data processing.

fingernail



Blood flow with a velocity of within 1mm

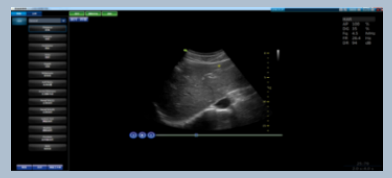


Types of experimental animals

- Mouse
- Rat
- Guinea pig
- Rabbit
- Canine
- Feline
- Miniature Pig
- Pig
- Ovis
- Equine
- Others

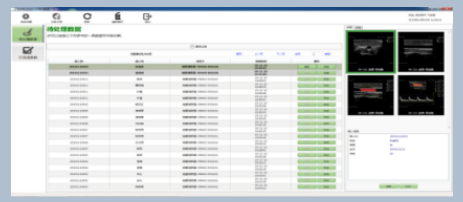
VCloud

Cloud
Database



RF data image transfe

VINNO
Intelligent
System



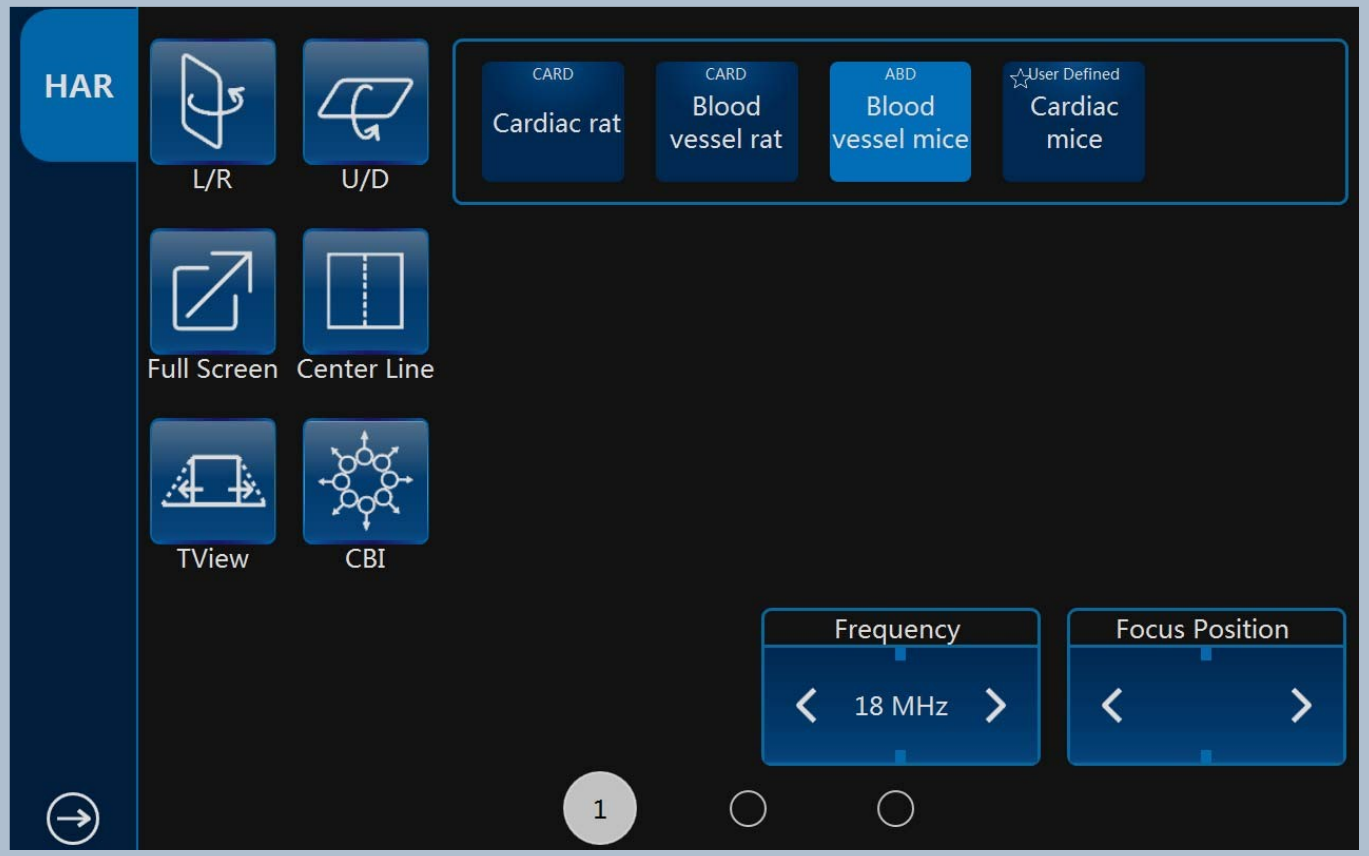
Post adjustment, report
Real-time streaming

Research
report

02

Operation interface

New operation mode



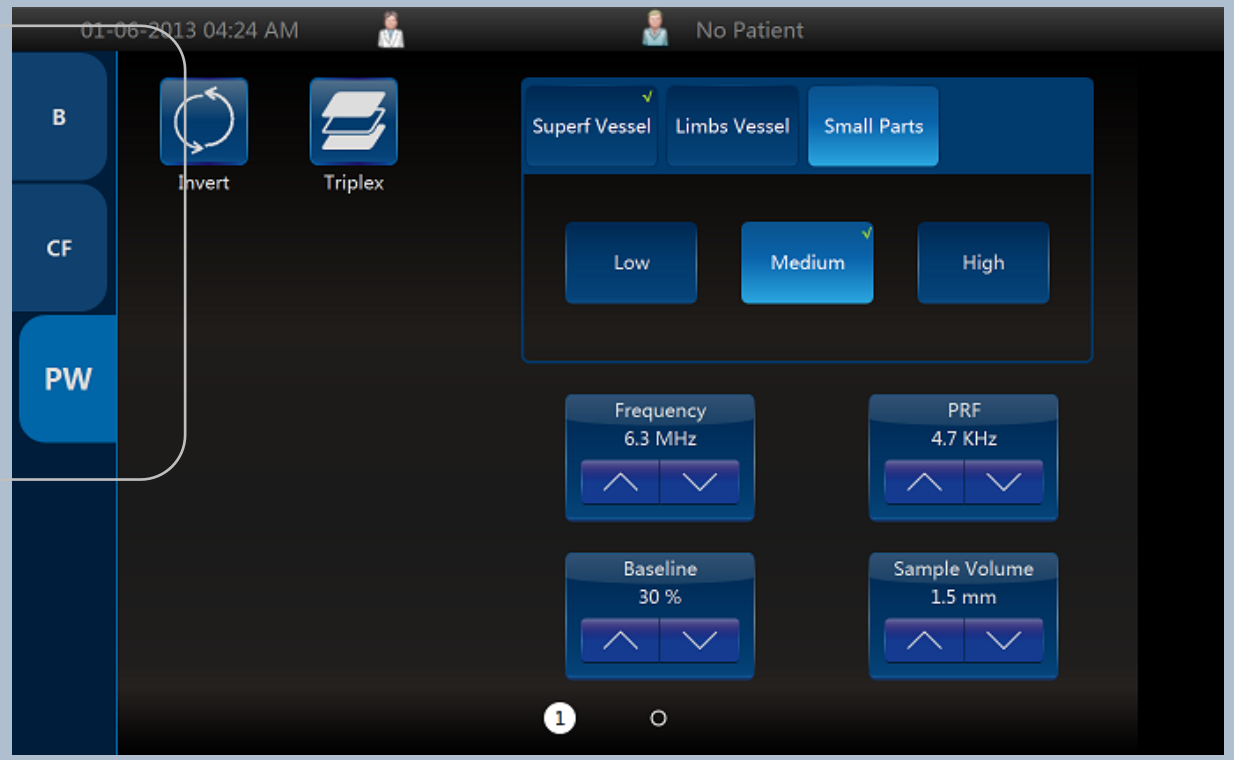
Traditional operating keyboard

- 8 ‘’ touch screen
- built-in animal measurement packets
- one click to select data packet
- to improve the consistency of experimental results

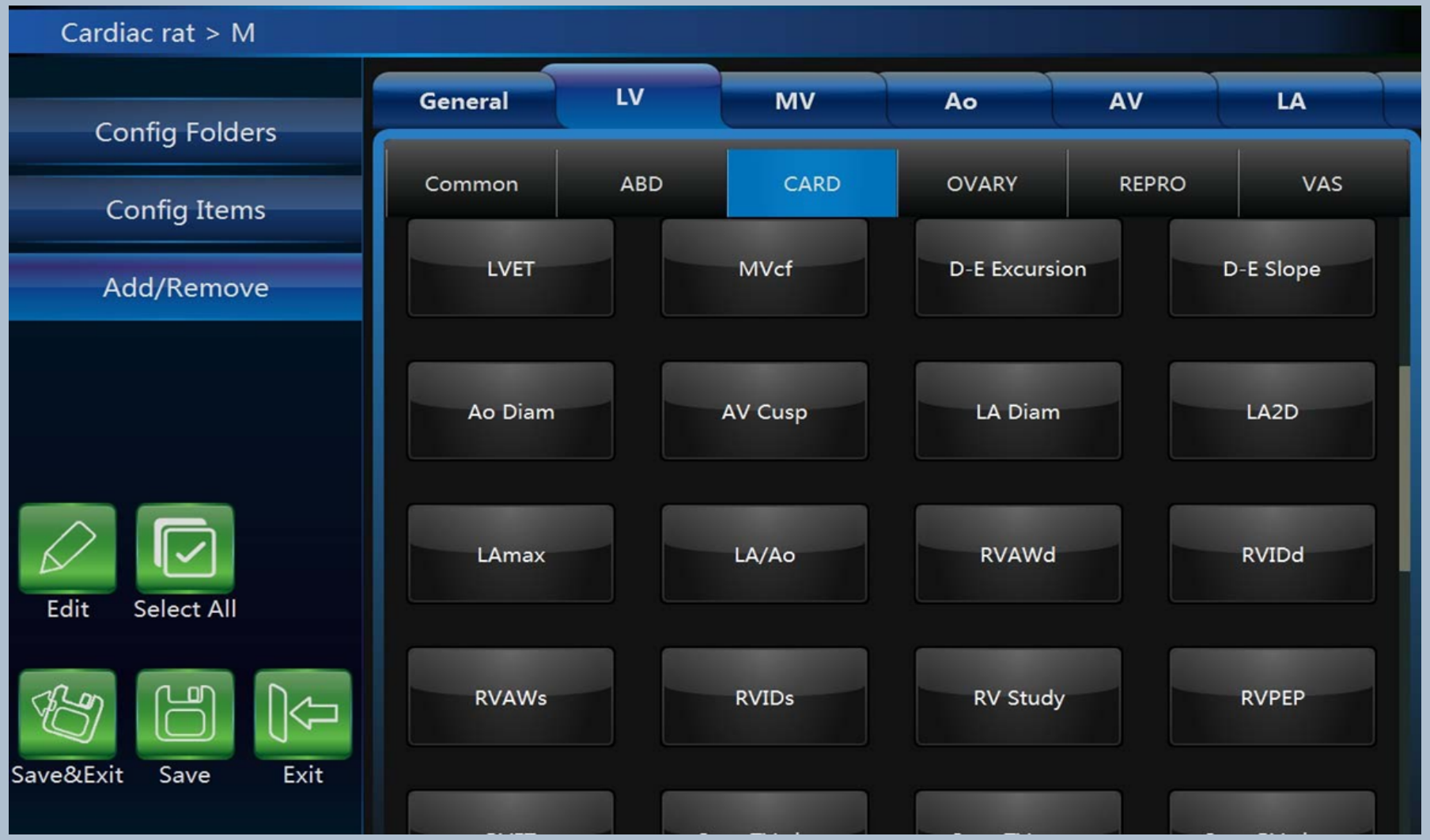
User Friendly Interface

Intuitive, configurable touch-screen user interface:

- 2D mode
- CF mode
- M Mode
- Contrast mode
- PW/CW mode
- Color Doppler mode
- Tissue Doppler mode
- ECG
- Elasticity imaging

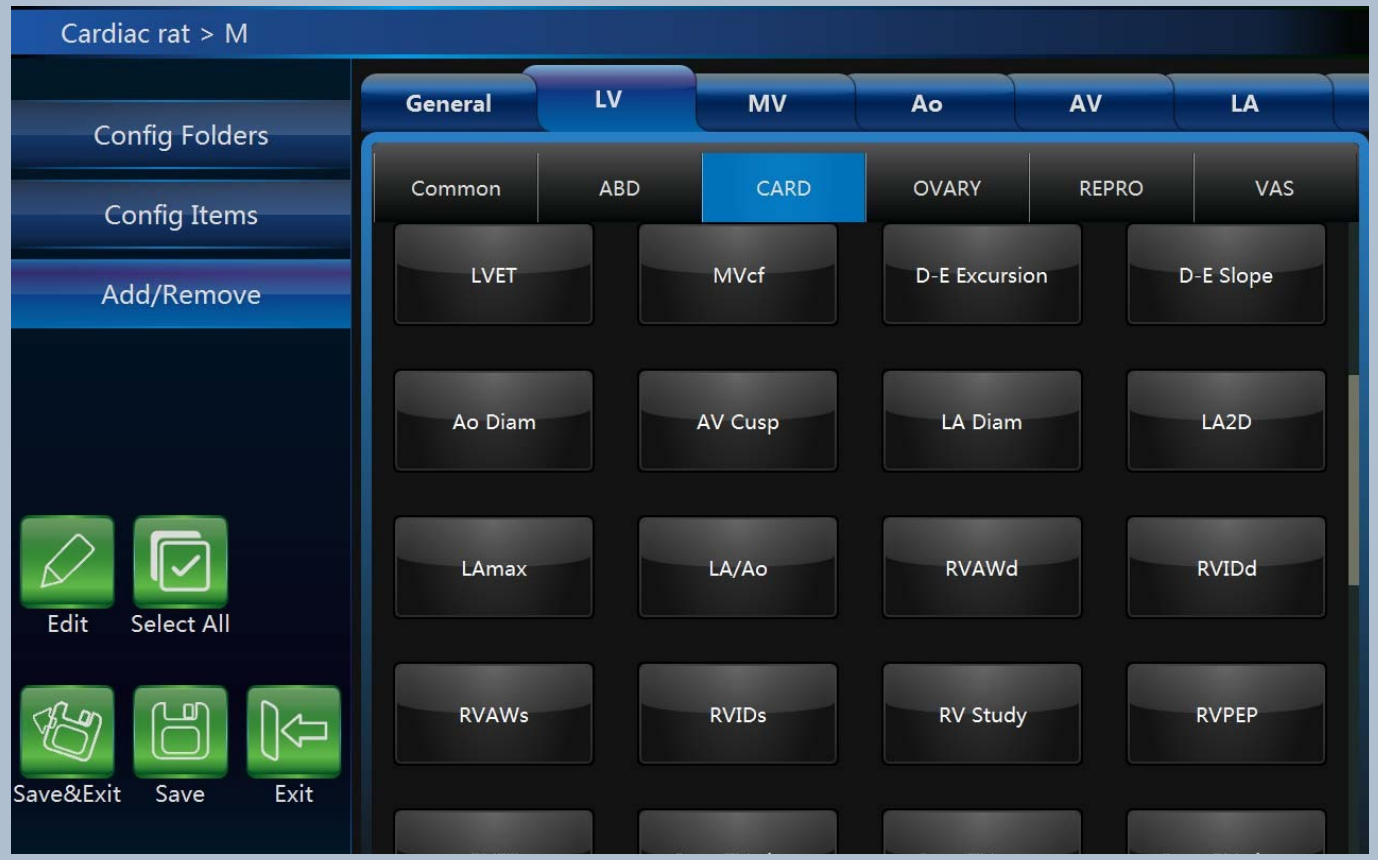


Complete functional modules：Cardiac measurement kit



Measurement parameter

HR
LVEDV
LVESV
SV
CO
CI
LVd Mass
EF
%FS
%IVS
IVSd
LVIDd
LVPWd
IVSs
LVIPs
LVPWs
MW E/A
MV Vel E
MV Vel A

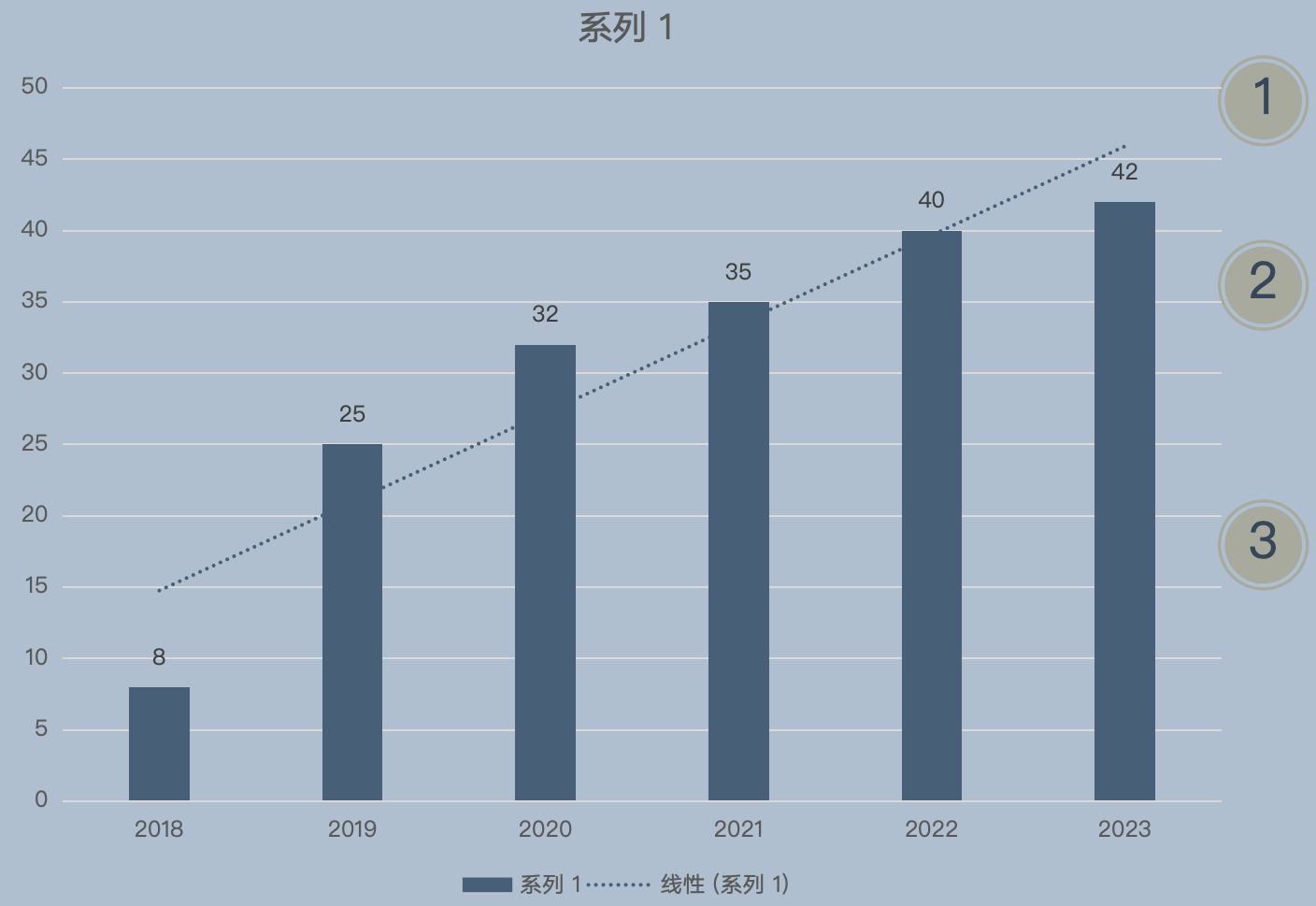


03

Market Overview

Market Background

VINNO sales in the past five years (Unit)



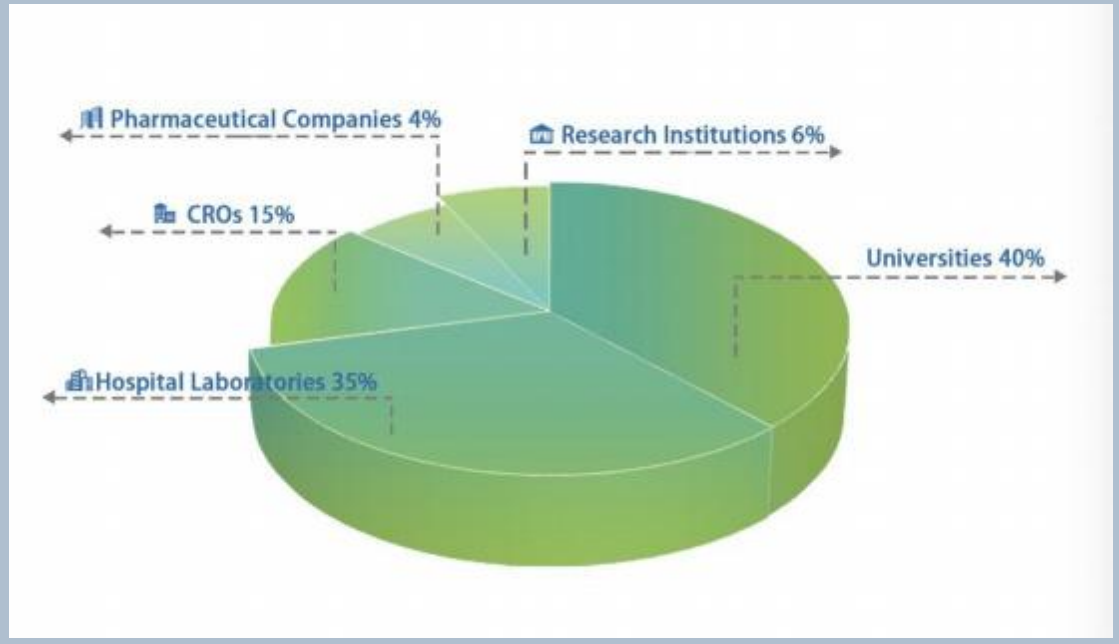
Total sales volume:200+

1. It entered the market late, but the sales increased steadily Y/Y

2. The growing customer base will stimulate greater market potential.A large customer base validates the stability and availability of the product.

3. Within 6 years,it catches up the sales volume of the former monopolist

Customer Classification



The roportion of customers with overseas Study backgroud

The Market Occupation of TOP 50 Universities in China

Part of Customers

Tsinghua University

Peking University

Wonkwang University

Johns Hopkins

Zhejiang University

Wuxi Apptech

Novo Nordisk

NHCS

Institute of Cardiovascular Medicine, Wuhan University

University of Gda ń sk

Catholic University of Korea

Publications

More than 100 publication

04

Application Examples

Part of publications

Liu S, Chen X, Bao L, Liu T, Yuan P, Yang X, Qiu X, Gooding JJ, Bai Y, Xiao J, Pu F, Jin Y. Treatment of infarcted heart tissue via the capture and local delivery of circulating exosomes through antibody-conjugated magnetic nanoparticles. Nat Biomed Eng. 2020 Nov;4(11):1063- 1075. doi: 10. 1038/s41551-020-00637- 1. Epub 2020 Nov 6. PMID: 33159193.
Liu H, Liu S, Qiu X, Yang X, Bao L, Pu F, Liu X, Li C, Xuan K, Zhou J, Deng Z, Liu S, Jin Y. Donor MSCs release apoptotic bodies to improve myocardial infarction via autophagy regulation in recipient cells. Autophagy. 2020 Dec;16(12):2140-2155. doi: 10. 1080/ 15548627.2020. 1717128. Epub 2020 Jan 29. PMID: 31959090; PMCID: PMC7751634.
He H, Wang L, Qiao Y, Yang B, Yin D, He M. Epigallocatechin-3-gallate pretreatment alleviates doxorubicin-induced ferroptosis and cardiotoxicity by upregulating AMPKα2 and activating adaptive autophagy. Redox Biol. 2021 Nov 11;48:102185. doi: 10. 1016/j.redox.2021. 102185. Epub ahead of print. PMID: 34775319; PMCID: PMC8600154.
Bao L, Dou G, Tian R, Lv Y, Ding F, Liu S, Zhao R, Zhao L, Zhou J, Weng L, Dong Y, Li B, Liu S, Chen X, Jin Y. Engineered neutrophil apoptotic bodies ameliorate myocardial infarction by promoting macrophage efferocytosis and inflammation resolution. Bioact Mater. 2021 Aug 27;9:183- 197. doi: 10. 1016/j.bioactmat.2021.08.008. PMID: 34820565; PMCID: PMC8586716.
Ma Y, Kuang Y, Bo W, Liang Q, Zhu W, Cai M, Tian Z. Exercise Training Alleviates Cardiac Fibrosis through Increasing Fibroblast Growth Factor 21 and Regulating TGF-β 1-Smad2/3-MMP2/9 Signaling in Mice with Myocardial Infarction. Int J Mol Sci. 2021 Nov 15;22(22):12341. doi: 10.3390/ijms222212341. PMID: 34830222; PMCID: PMC8623999.
Bo W, Ma Y, Xi Y, Liang Q, Cai M, Tian Z. The Roles of FGF21 and ALCAT1 in Aerobic Exercise-Induced Cardioprotection of Postmyocardial Infarction Mice. Oxid Med Cell Longev. 2021 Nov 5;2021:8996482. doi: 10. 1155/2021/8996482. PMID: 34777697; PMCID: PMC8589520.
Li H, Qin S, Liang Q, Xi Y, Bo W, Cai M, Tian Z. Exercise Training Enhances Myocardial Mitophagy and Improves Cardiac Function via Irisin/FNDC5-PINK1/Parkin Pathway in MI Mice. Biomedicines. 2021 Jun 21;9(6):701. doi: 10.3390/biomedicines9060701. PMID: 34205641; PMCID: PMC8234442.

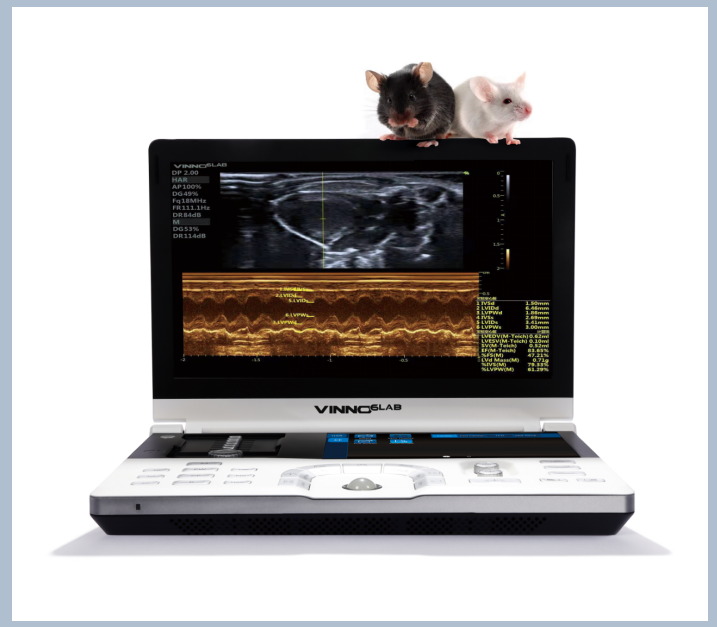
Part of publications

Yang H, He Y, Zou P, Hu Y, Li X, Tang L, Zhu Z, Tai S, Tu T, Xiao Y, Chen M, Wu C, Zhou S. Legumain is a predictor of all-cause mortality and potential therapeutic target in acute myocardial infarction. Cell Death Dis. 2020 Nov 26;11(11):1014. doi: 10. 1038/s41419-020-03211-4. PMID: 33243972; PMCID: PMC7691341.
Zhang M, Wang Z, Cheng Q, Wang Z, Lv X, Wang Z, Li N. Circular RNA (circRNA) CDYL Induces Myocardial Regeneration by ceRNA After Myocardial Infarction. Med Sci Monit. 2020 Jun 11;26:e923188. doi: 10. 12659/MSM.923188. PMID: 32522972; PMCID: PMC7304314.
Liu X, Shan X, Chen H, Li Z, Zhao P, Zhang C, Guo W, Xu M and Lu R (2019) Stachydrine Ameliorates Cardiac Fibrosis Through Inhibition of Angiotensin II/Transformation Growth Factor β 1 Fibrogenic Axis. Front. Pharmacol. 10:538. doi: 10.3389/fphar.2019.00
Ren C, Sun K, Zhang Y, Hu Y, Hu B, Zhao J, He Z, Ding R, Wang W and Liang C (2021) Sodium–Glucose CoTransporter-2 Inhibitor Empagliflozin Ameliorates Sunitinib-Induced Cardiac Dysfunction via Regulation of AMPK–mTOR Signaling Pathway–Mediated Autophagy. Front. Pharmacol. 12:664181. doi: 10.3389/fphar.2021.664181
Kim HY, Yoon JJ, Lee HK, Tai AL, Lee YJ, Kim DS, Kang DG, Lee HS. Blackcurrant Improves Diabetic Cardiovascular Dysfunction by Reducing Inflammatory Cytokines in Type 2 Diabetes Mellitus Mice Nutrients. 2021 Nov 22;13(11):4177. doi: 10.3390/nu13114177. PMID: 34836432; PMCID: PMC8618700.
Guo Y, Zhang C, Ye T, Chen X, Liu X, Chen X, Sun Y, Qu C, Liang J, Shi S, Yang B. Pinocembrin ameliorates arrhythmias in rats with chronic ischaemic heart failure. Ann Med. 2021 Dec;53(1):830-840. doi: 10. 1080/07853890.2021. 1927168. PMID: 34060948; PMCID: PMC8172224.
Lei W, Li J, Li C, Chen L, Huang F, Xiao D, Zhang J, Zhao J, Li G, Qu T, Zhou H, Liao Y, Chen M. MARCH5 restores endothelial cell function against ischaemic/hypoxia injury via Akt/eNOS pathway. J Cell Mol Med. 2021 Apr;25(7):3182-3193. doi: 10. 1111/jcmm. 16386. Epub 2021 Feb 21. PMID: 33611830; PMCID: PMC8034466.
cite Zhang X, Zhang Z, Wang P, Han Y, Liu L, Li J, Chen Y, Liu D, Wang J, Tian X, Zhao Q, Yan F. Bawei Chenxiang Wan Ameliorates Cardiac Hypertrophy by Activating AMPK/PPAR-α Signaling Pathway Improving Energy Metabolism. Front Pharmacol. 2021 Jun 3;12:653901. doi: 10.3389/fphar.2021.653901. PMID: 34149410; PMCID: PMC8209424

Application

Application Field

1. Heart Research
2. Vascular Research
3. Brain Science
4. Reproductive Research
5. Tumor Research
6. Abdominal organs
7. Respirology



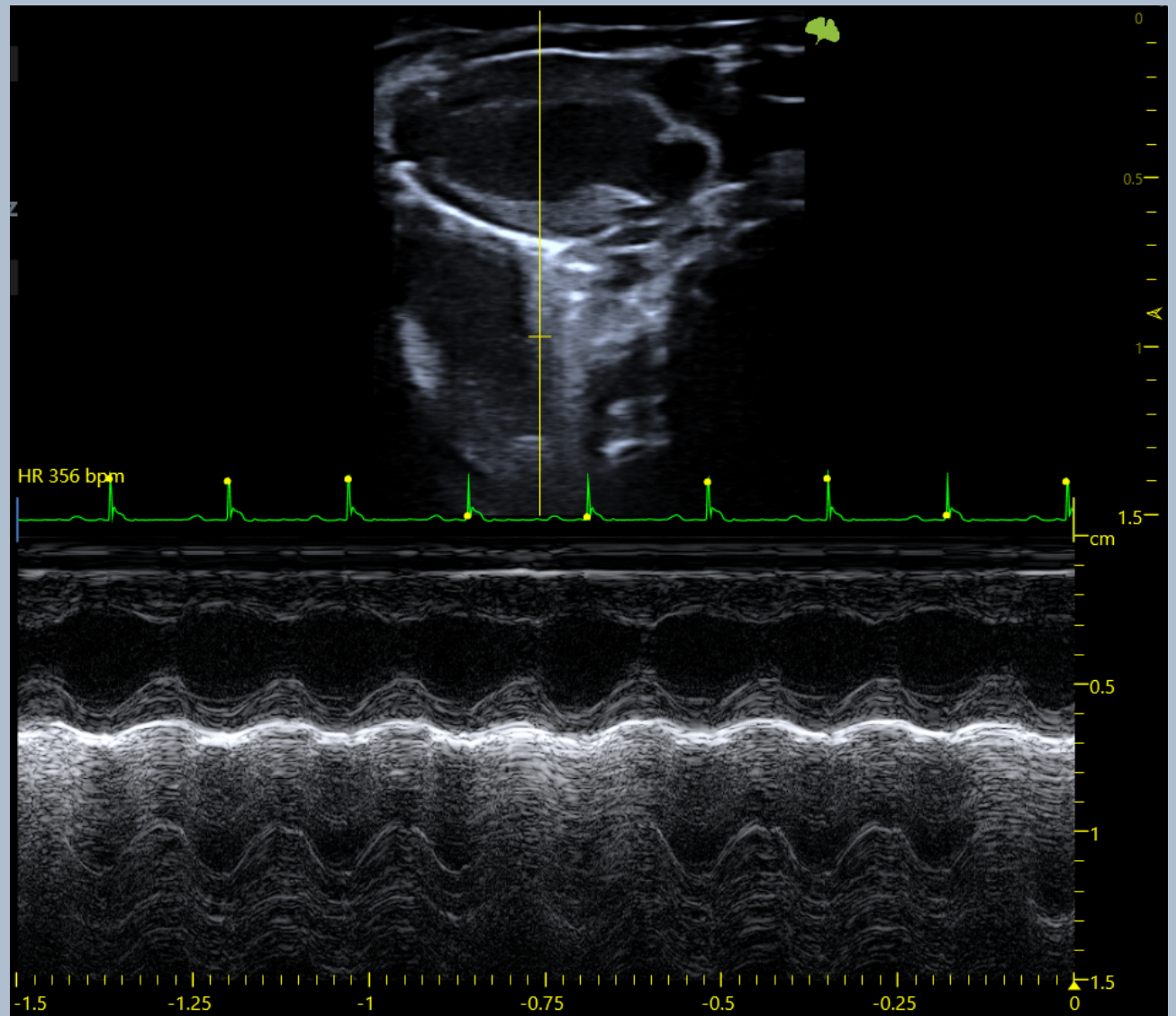
1.Cardiac

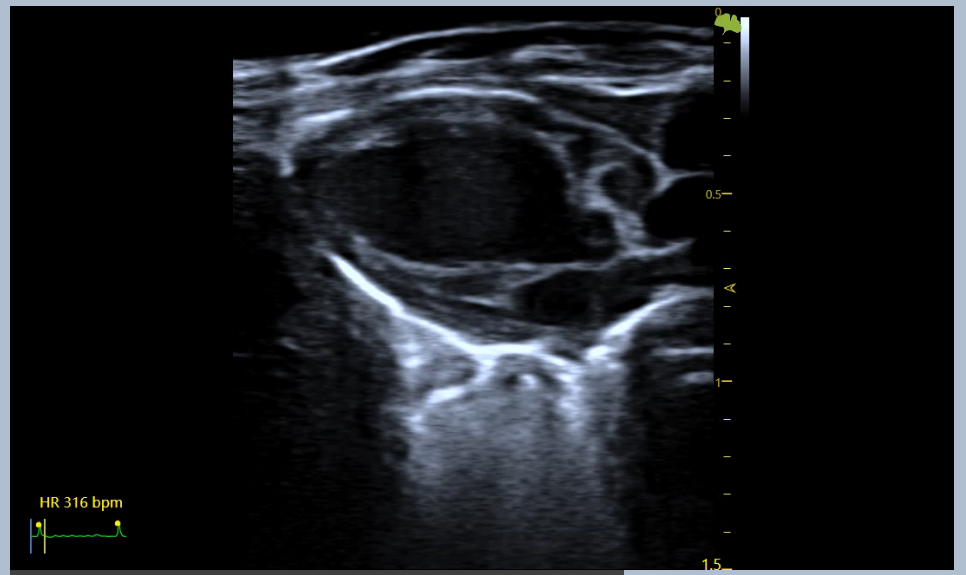
Including cardiac morphology, structure of each chamber, coronary artery and great vessel ultrasonic research. Combined with cardiac B-mode and M-mode ultrasound imaging, it can effectively record the changes in the shape and structure of the heart at each movement stage during the cardiac cycle and the measurement of cardiac function in real time. It can measure blood flow velocity, blood flow and other indicators. changes are measured.

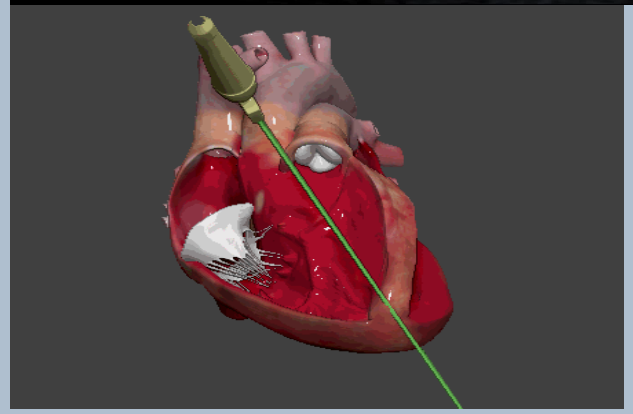
It can be applied to basic medical small animal experimental research on cardiovascular diseases, such as myocardial infarction, myocardial hypertrophy, heart failure, hypertension, and various congenital heart diseases using experimental animals such as rats as models.

Application Examples

Long axis view

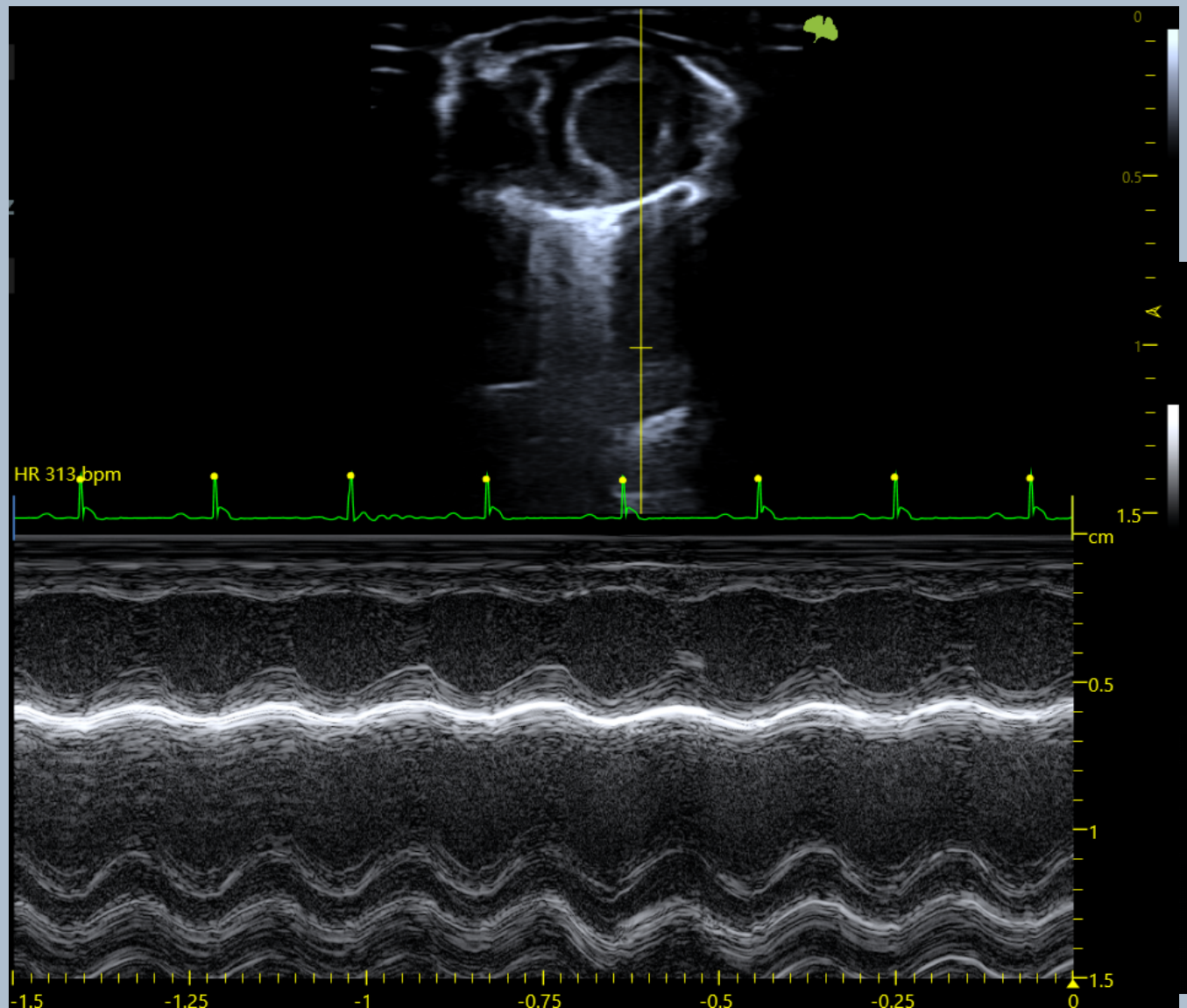


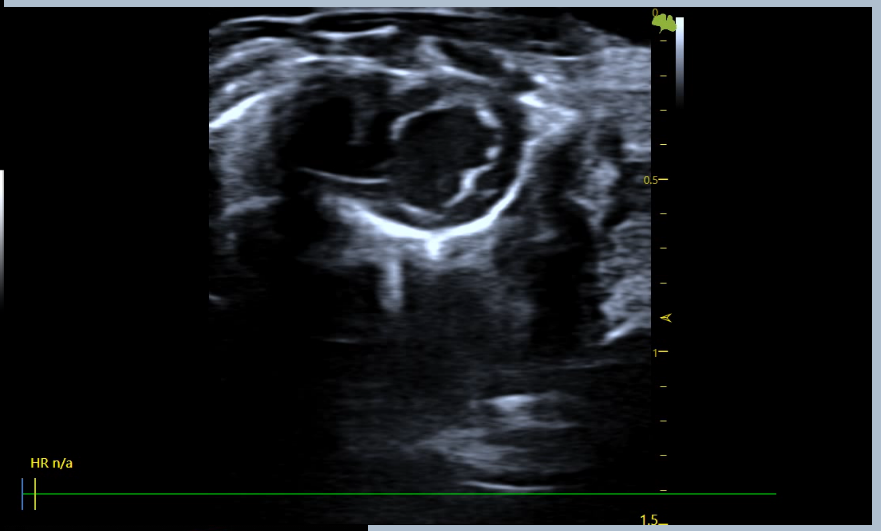


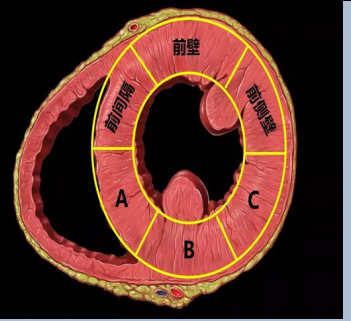


Application Examples

short axis view

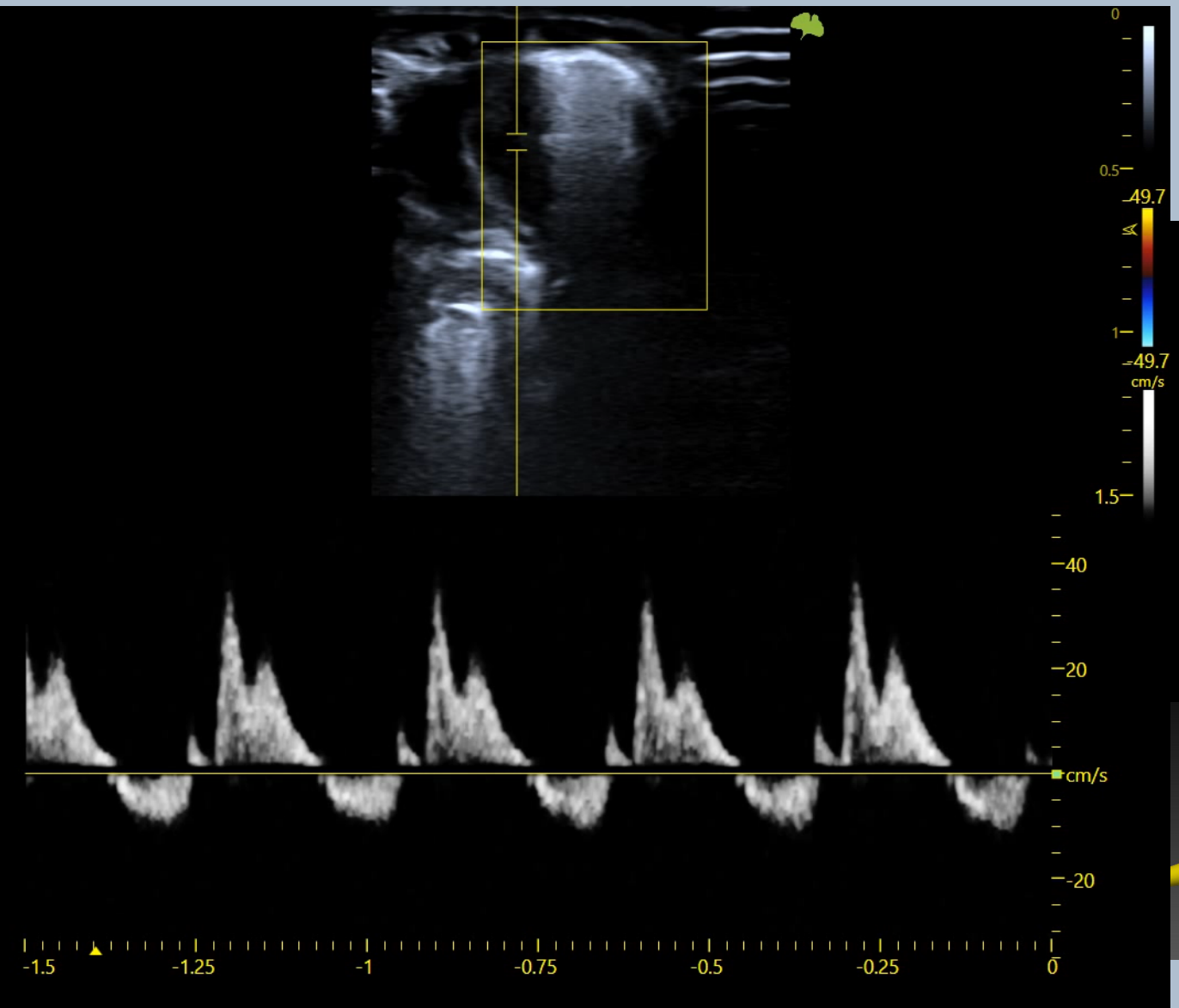


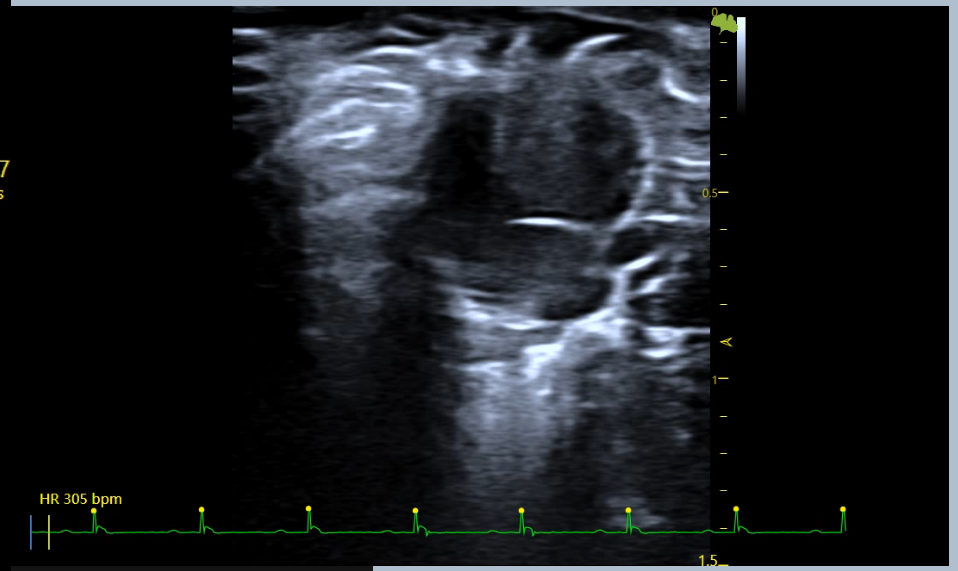


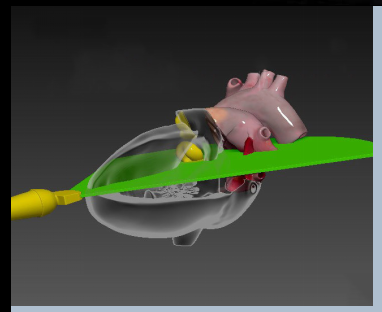


Application Examples

Apical four-chamber section, mitral valve blood flow +E/A peak

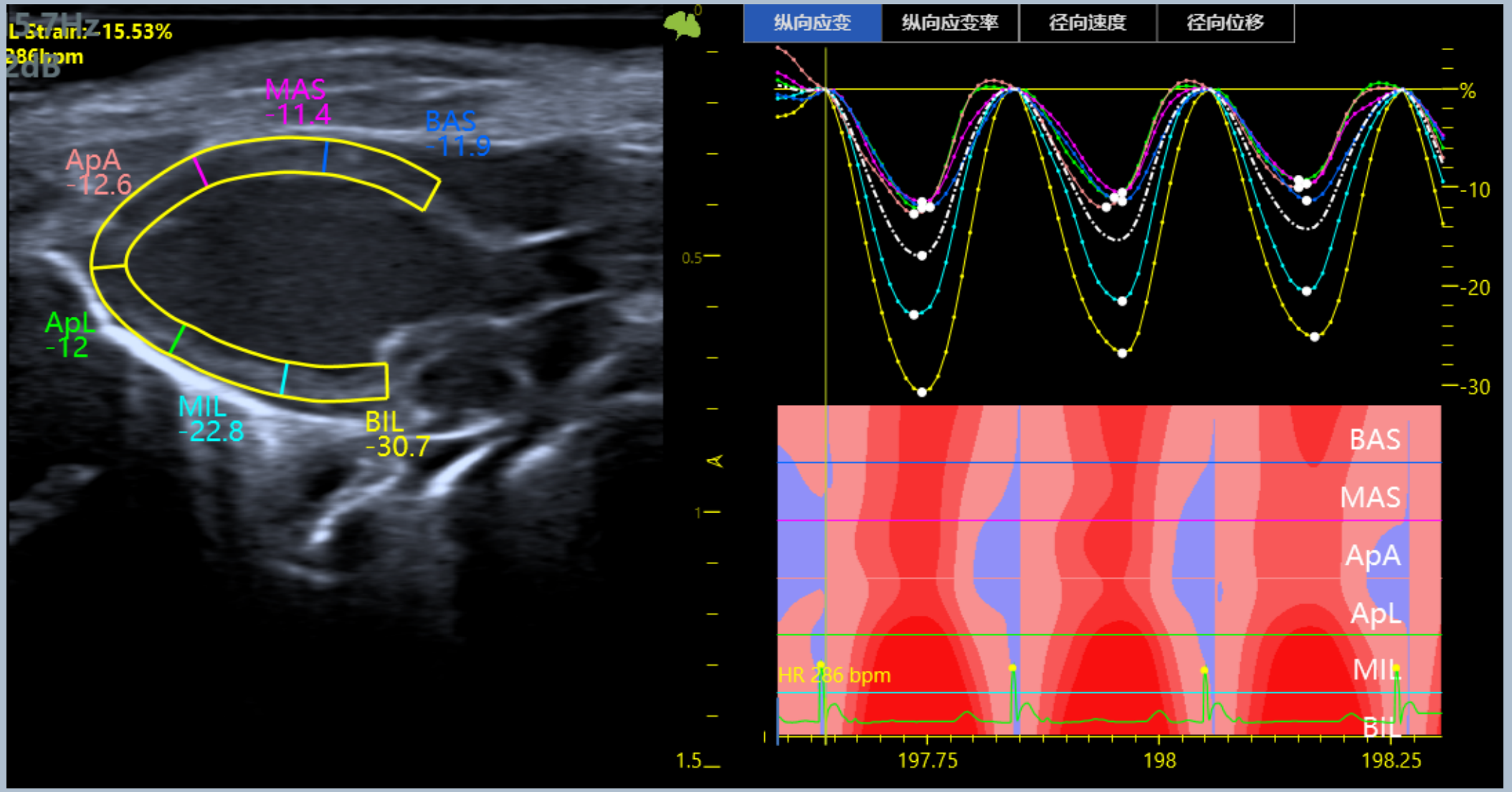






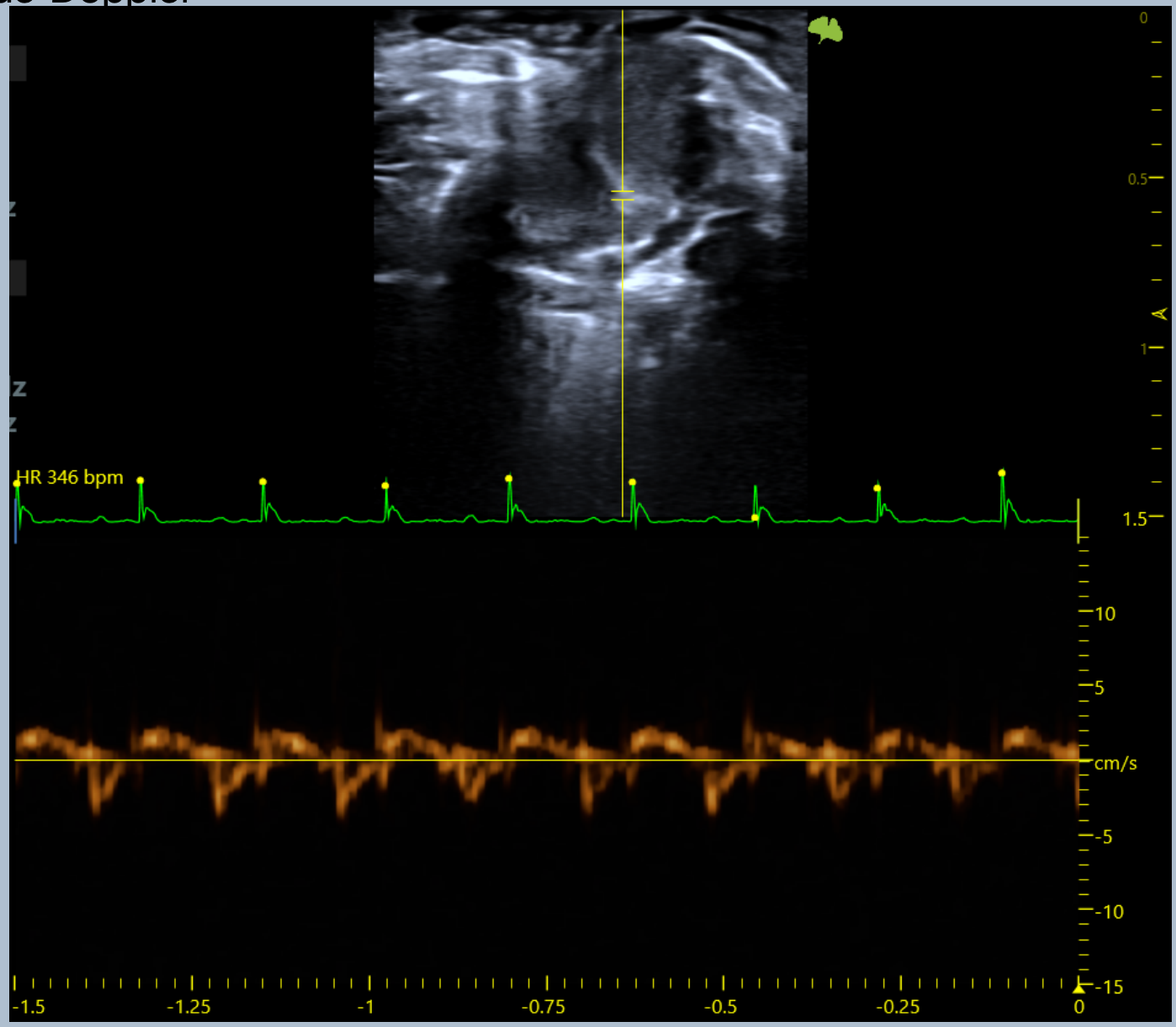
Application Examples

Strain Function



Application Examples

Mouse heart tissue Doppler

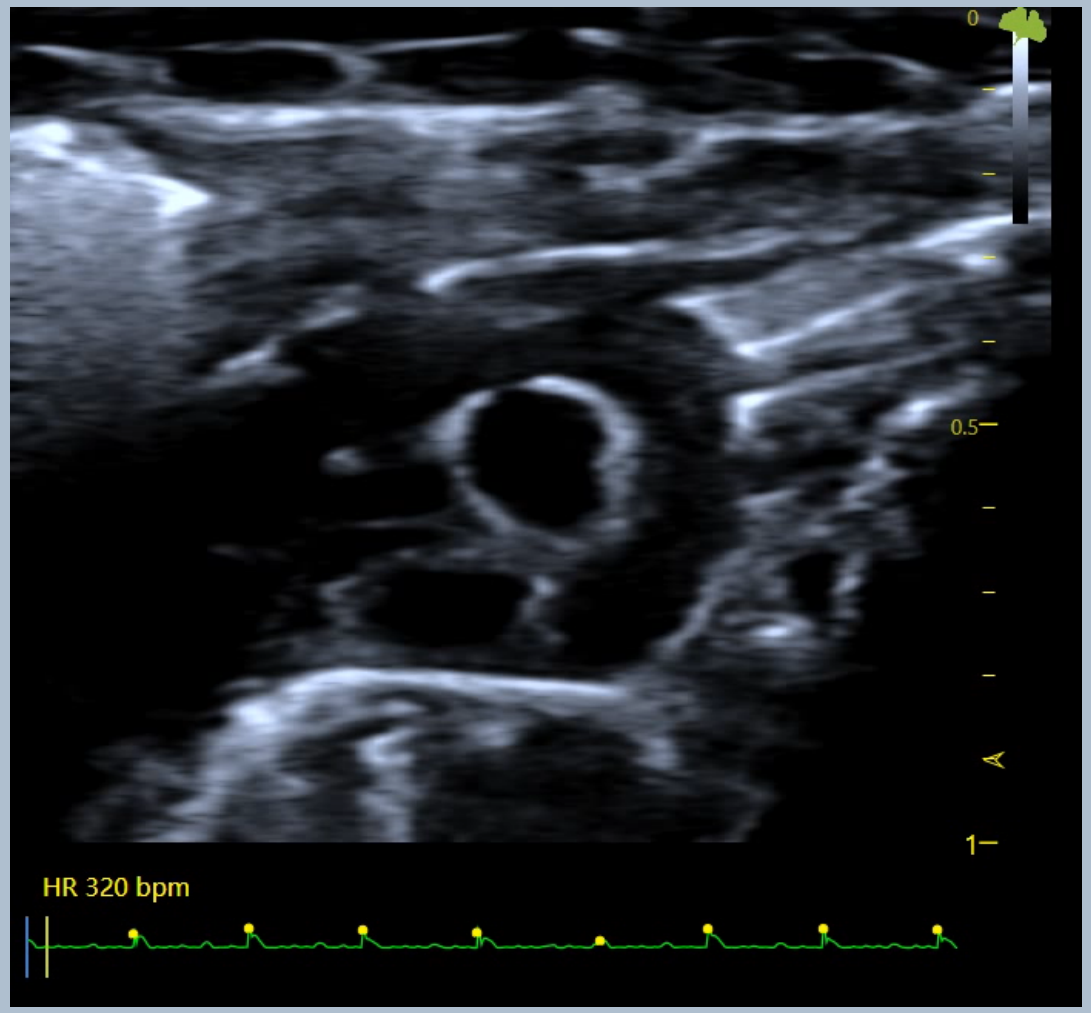


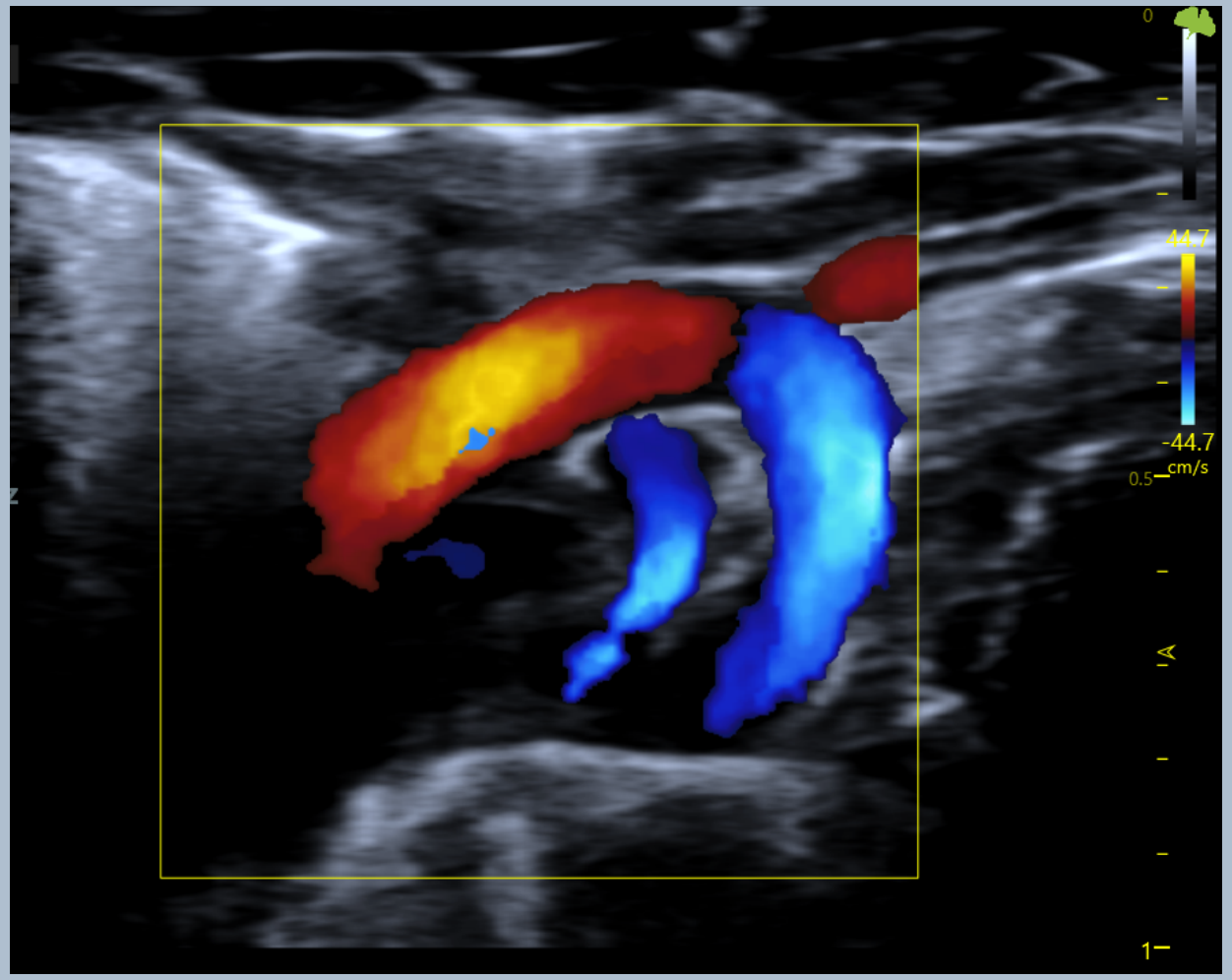
2.Angiography

It can detect cross-sectional images of blood vessels, accurately measure the thickness of the arterial wall of experimental animals, the size of the lumen, and measure the intima, media, and adventitia of the vessel wall.

Application Examples

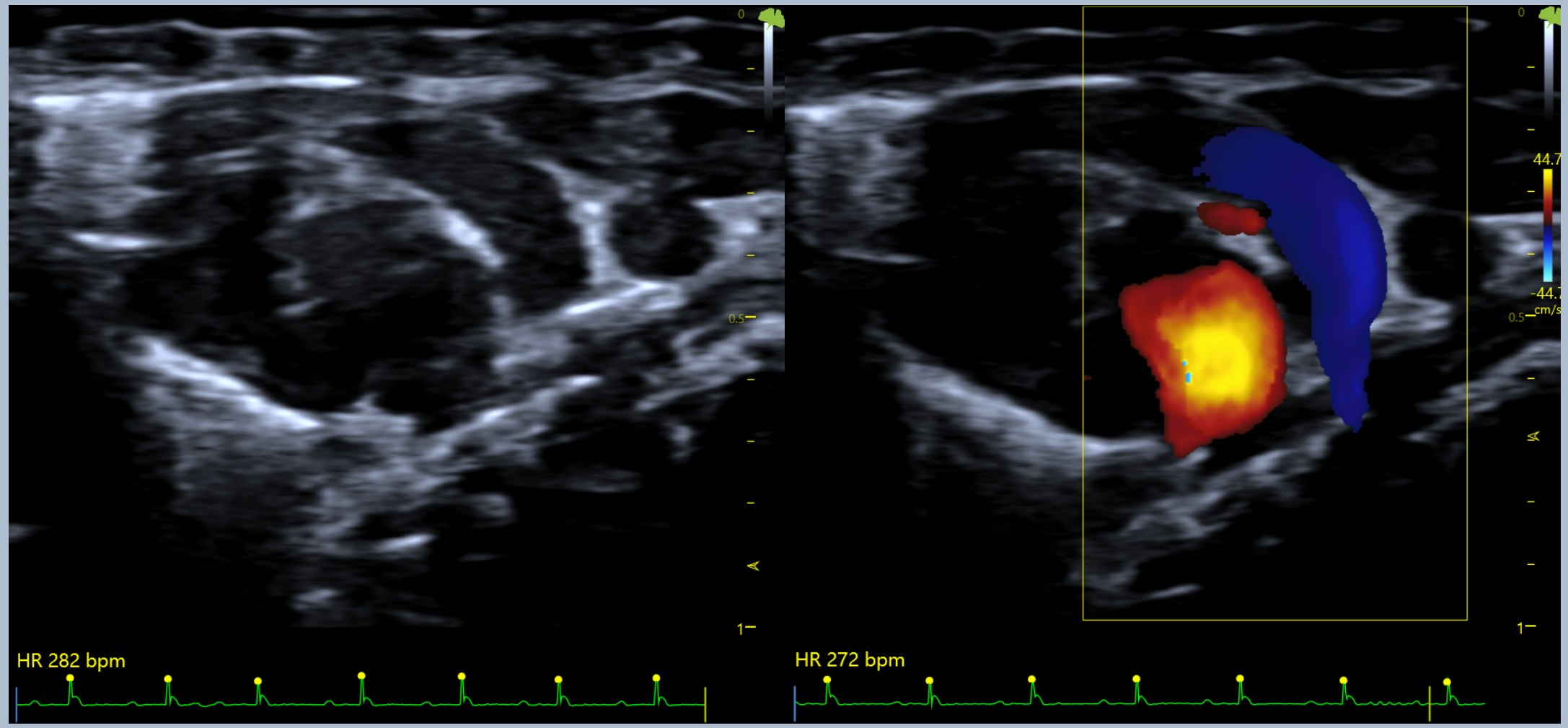
Aortic arch long-axis view + color Doppler blood flow





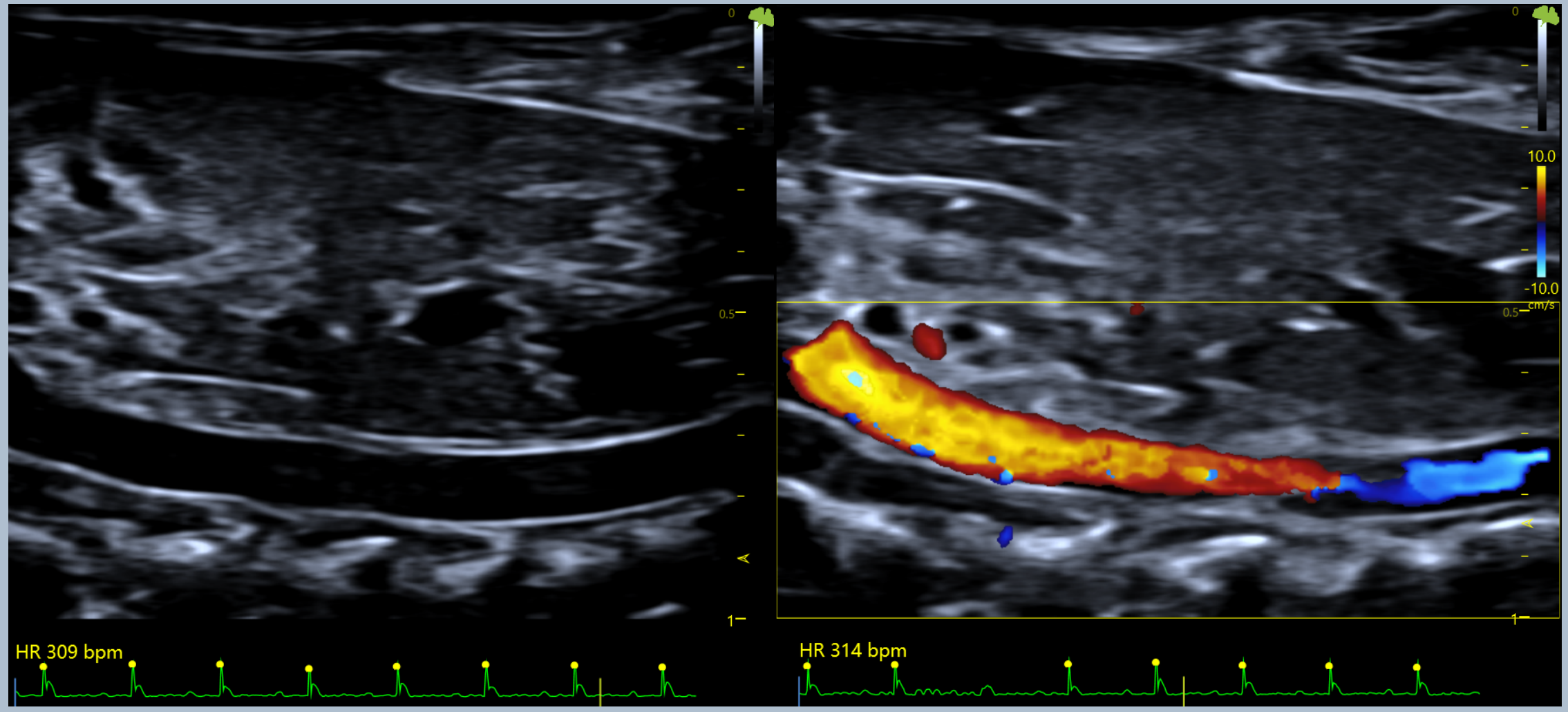
Application Examples

mouse pulmonary artery



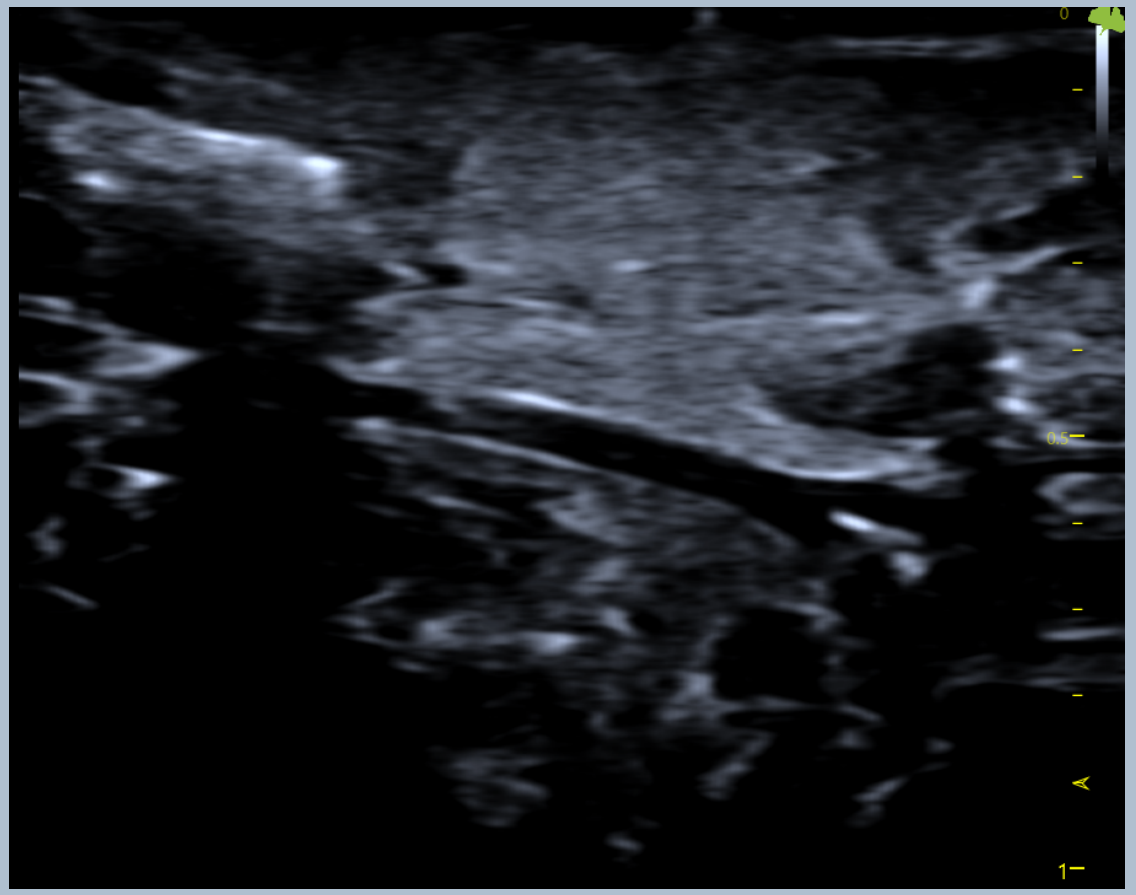
Application Examples

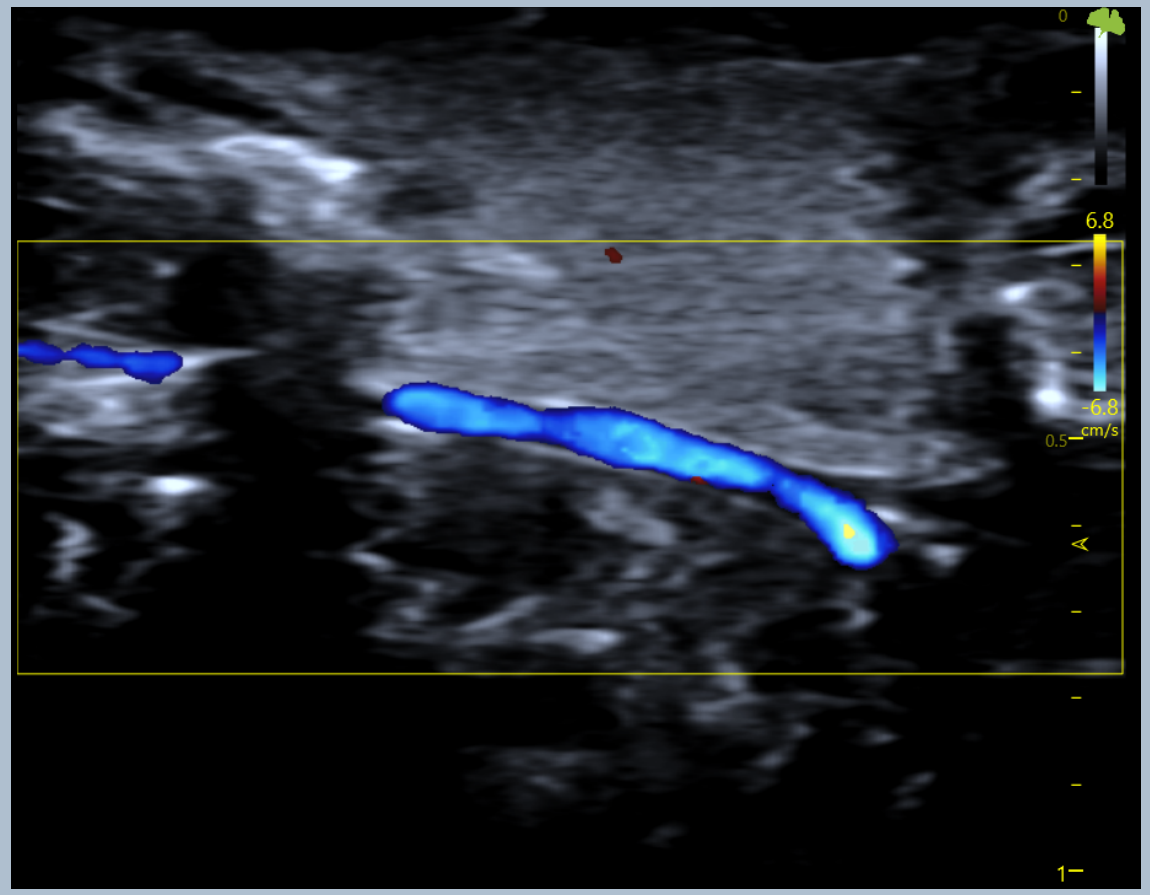
mouse abdominal aorta



Application Examples

Mouse carotid artery



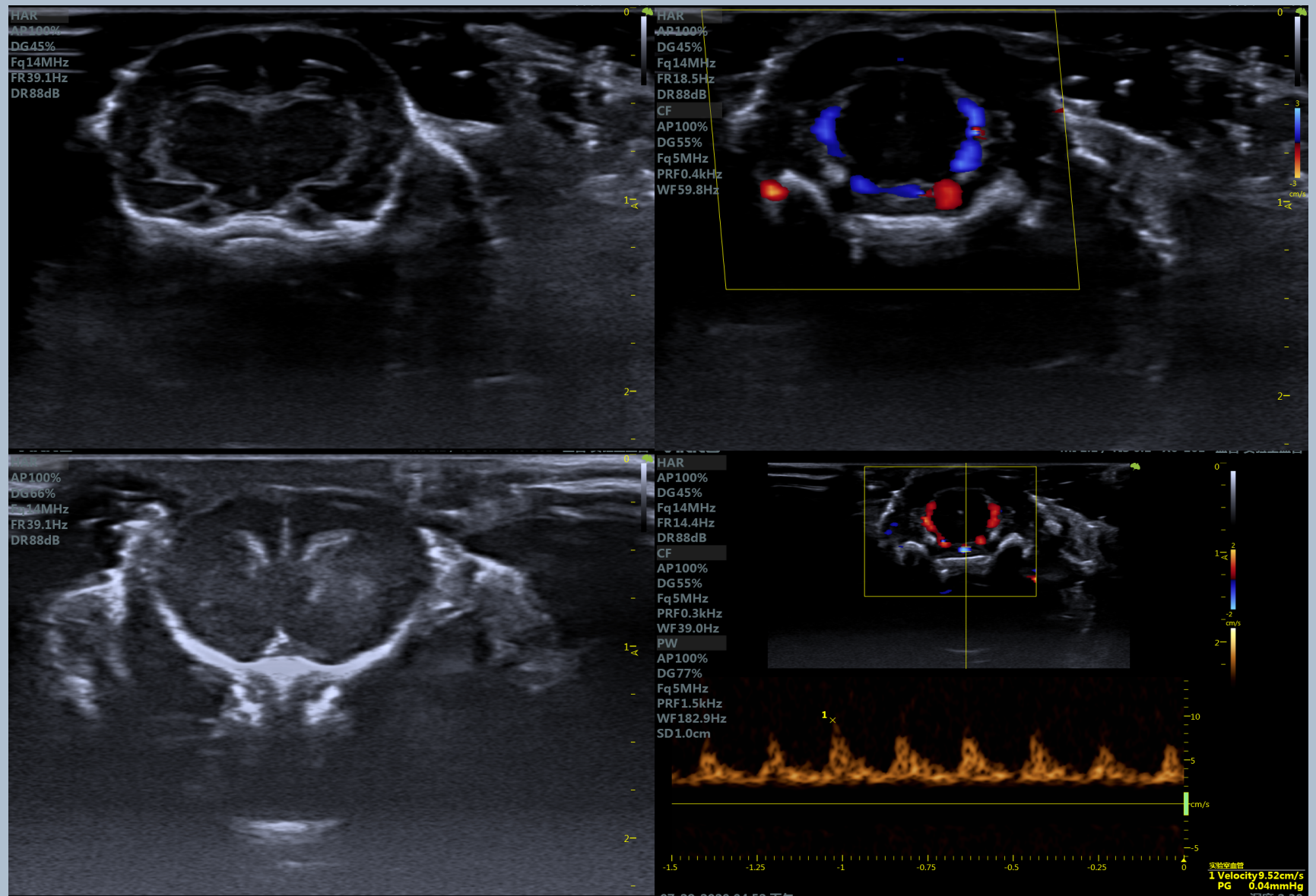


3.Brain

For research on brain tissue, blood flow, tumors, etc.

Application Examples

mouse brain

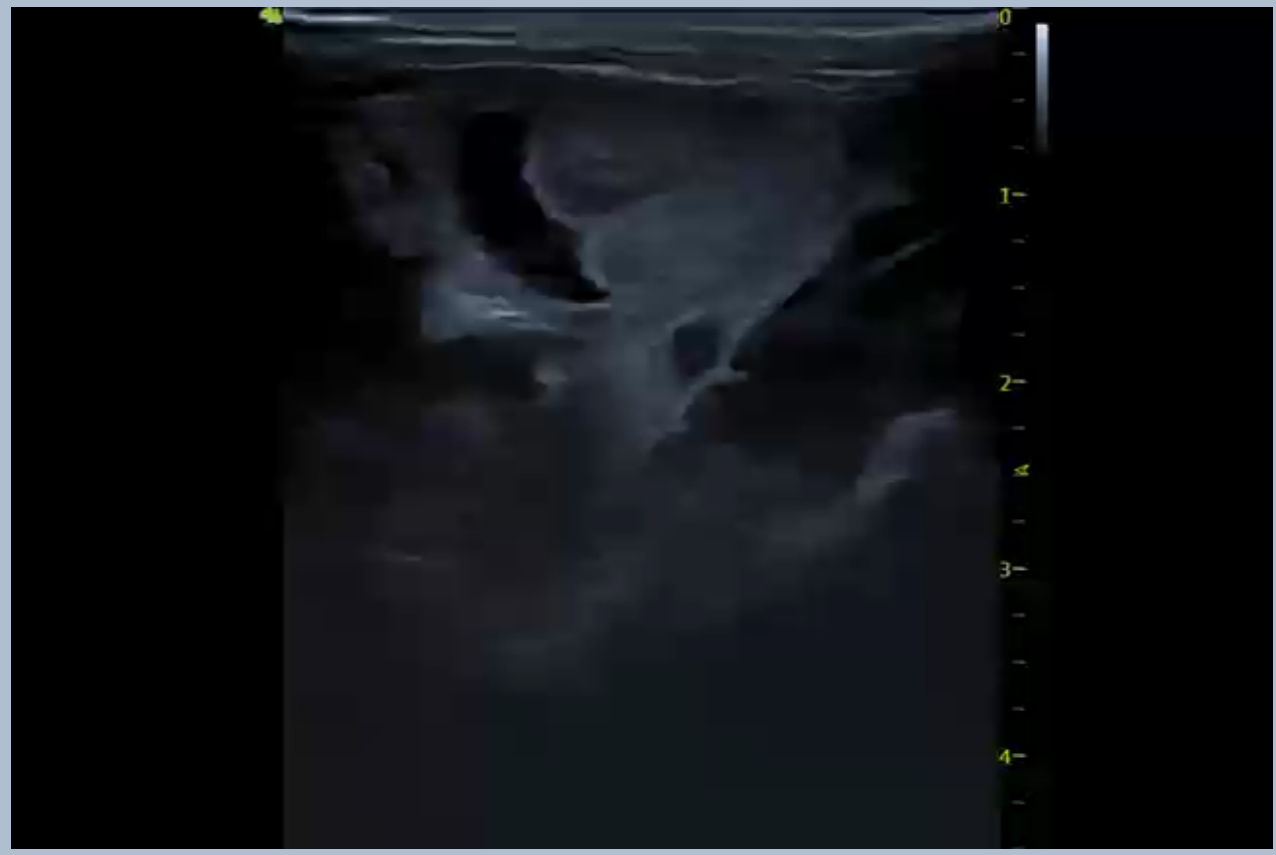


4.developmental biology

Research on embryonic development of experimental animals, using its built-in functional modules, can realize developmental research from early embryonic development to neonatal to adulthood.

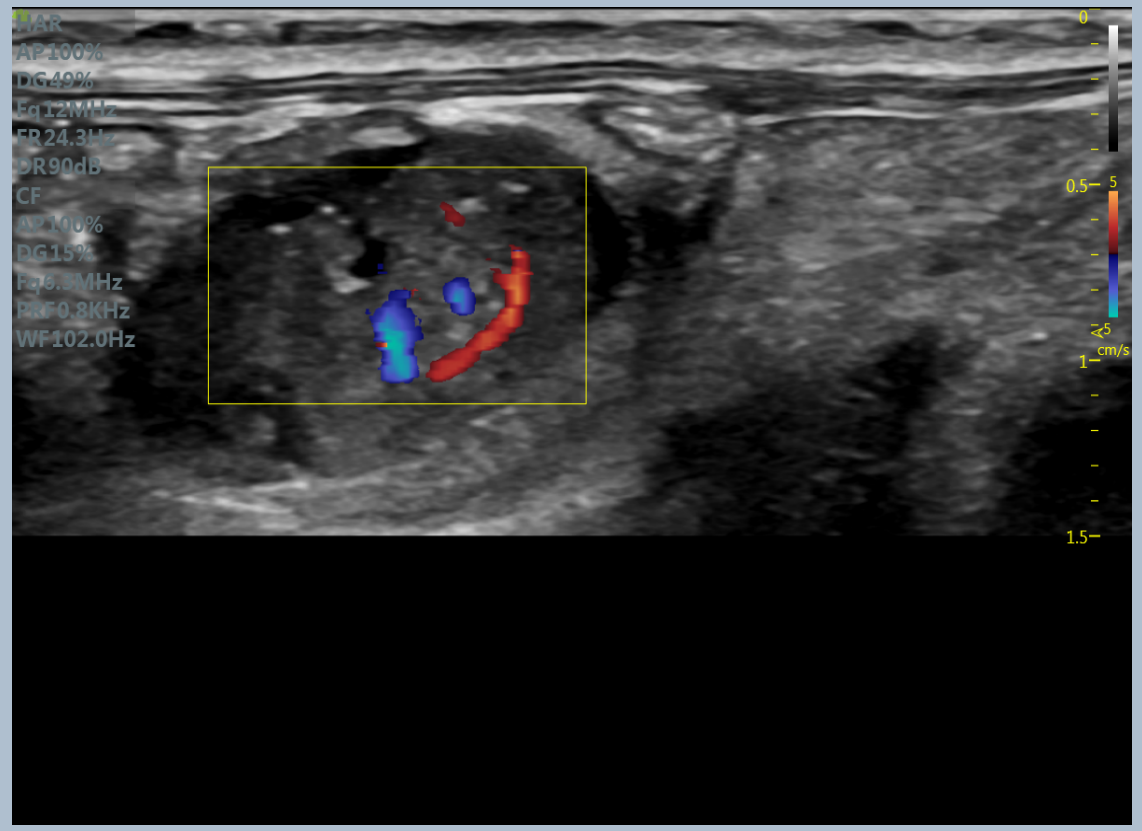
Application Examples

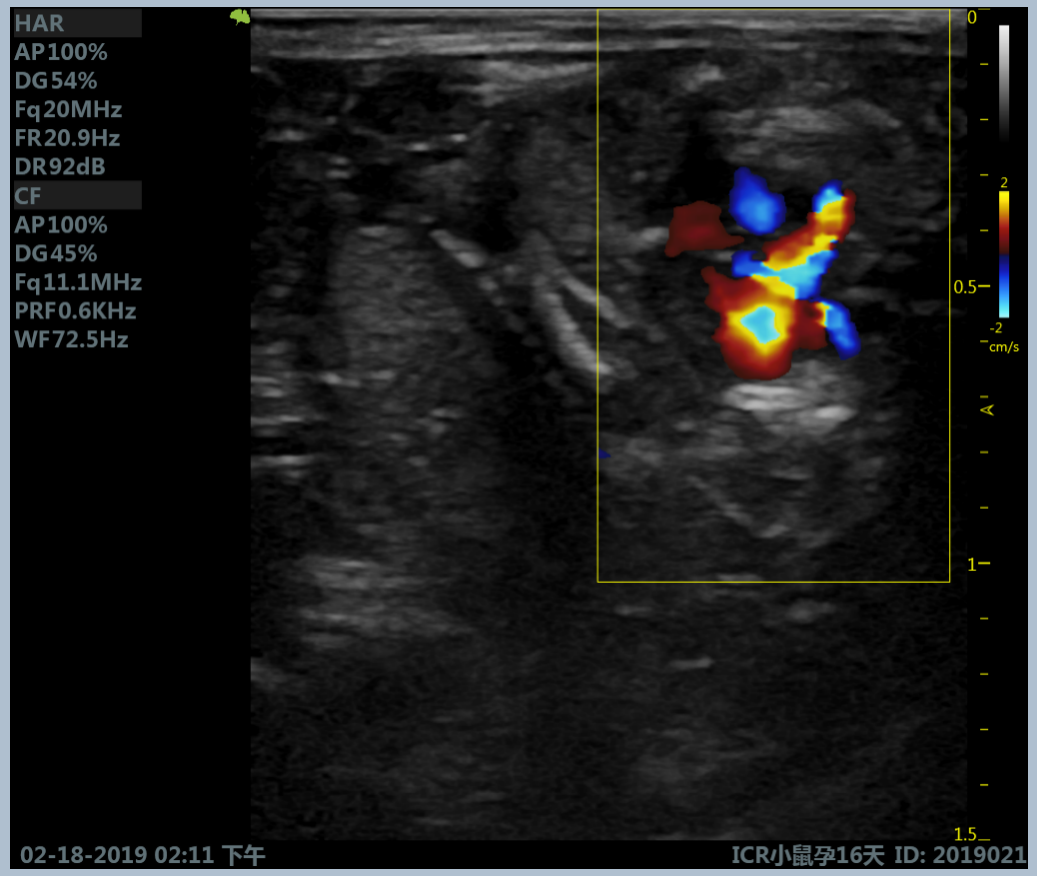
Uterine Imaging



Application Examples

Cardiac Function Evaluation of 15–day–old Fetal mouse





Application Examples

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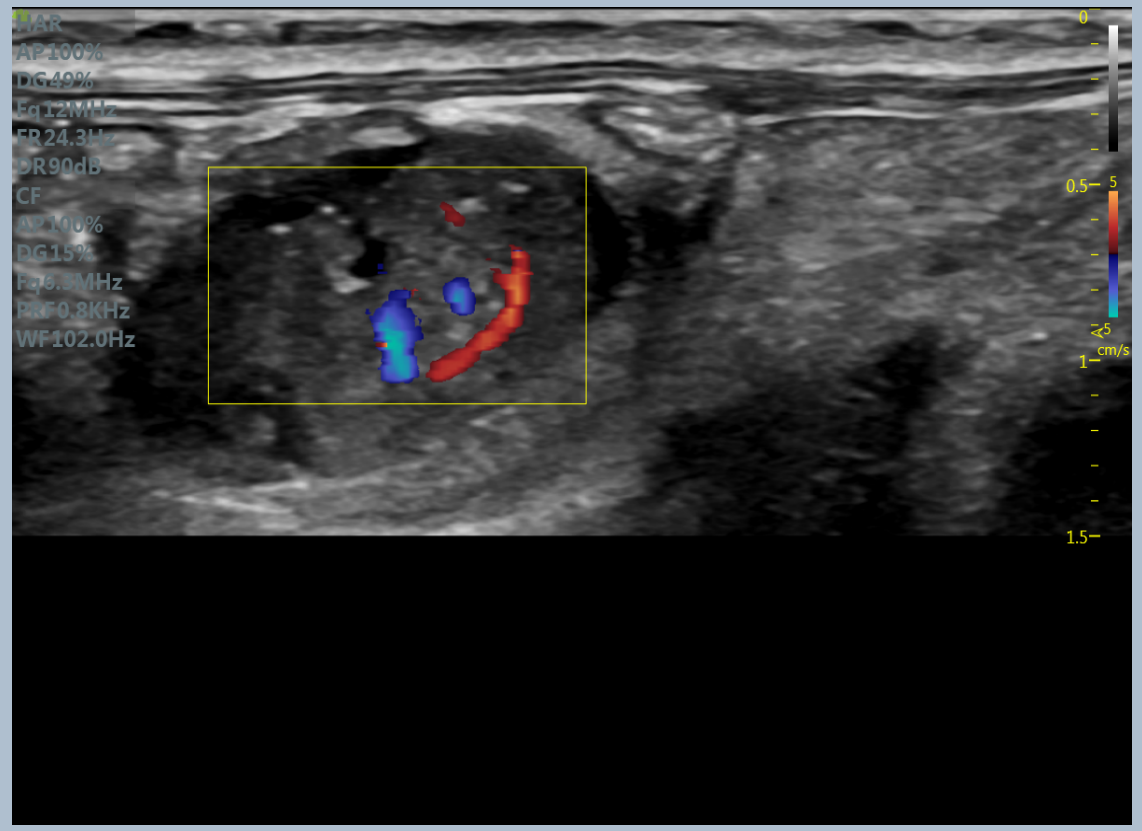
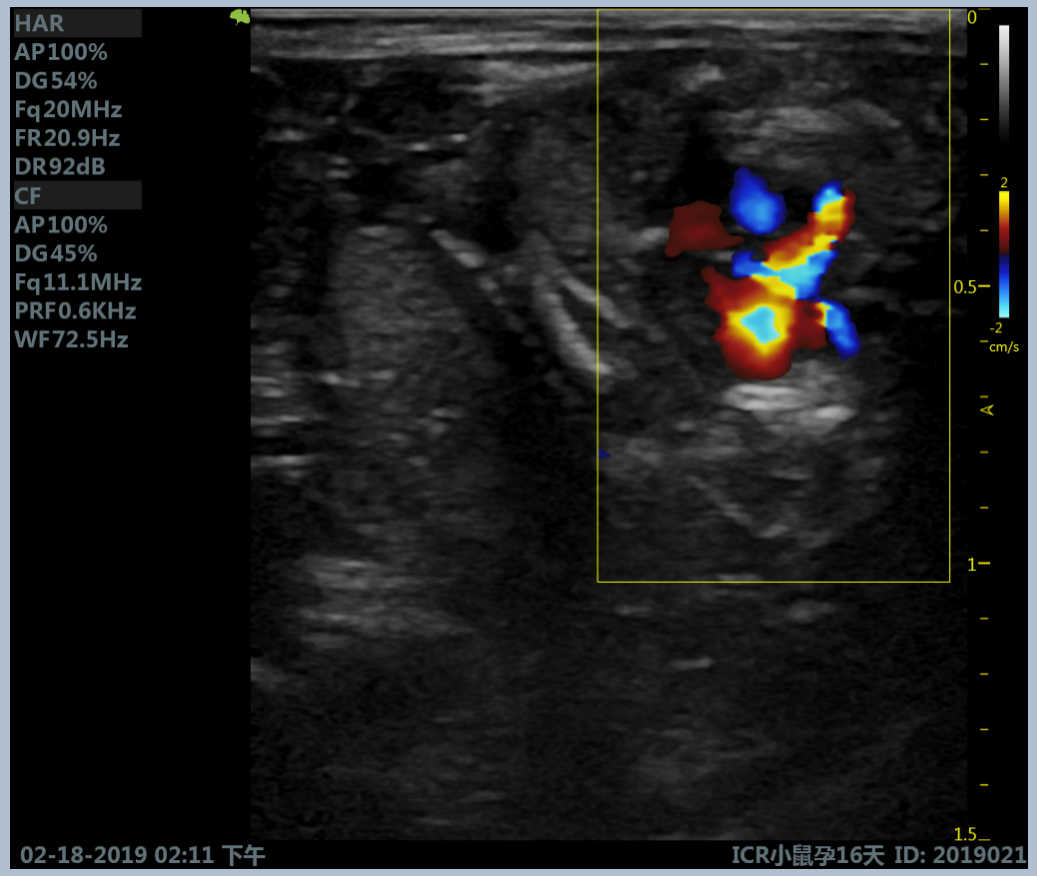
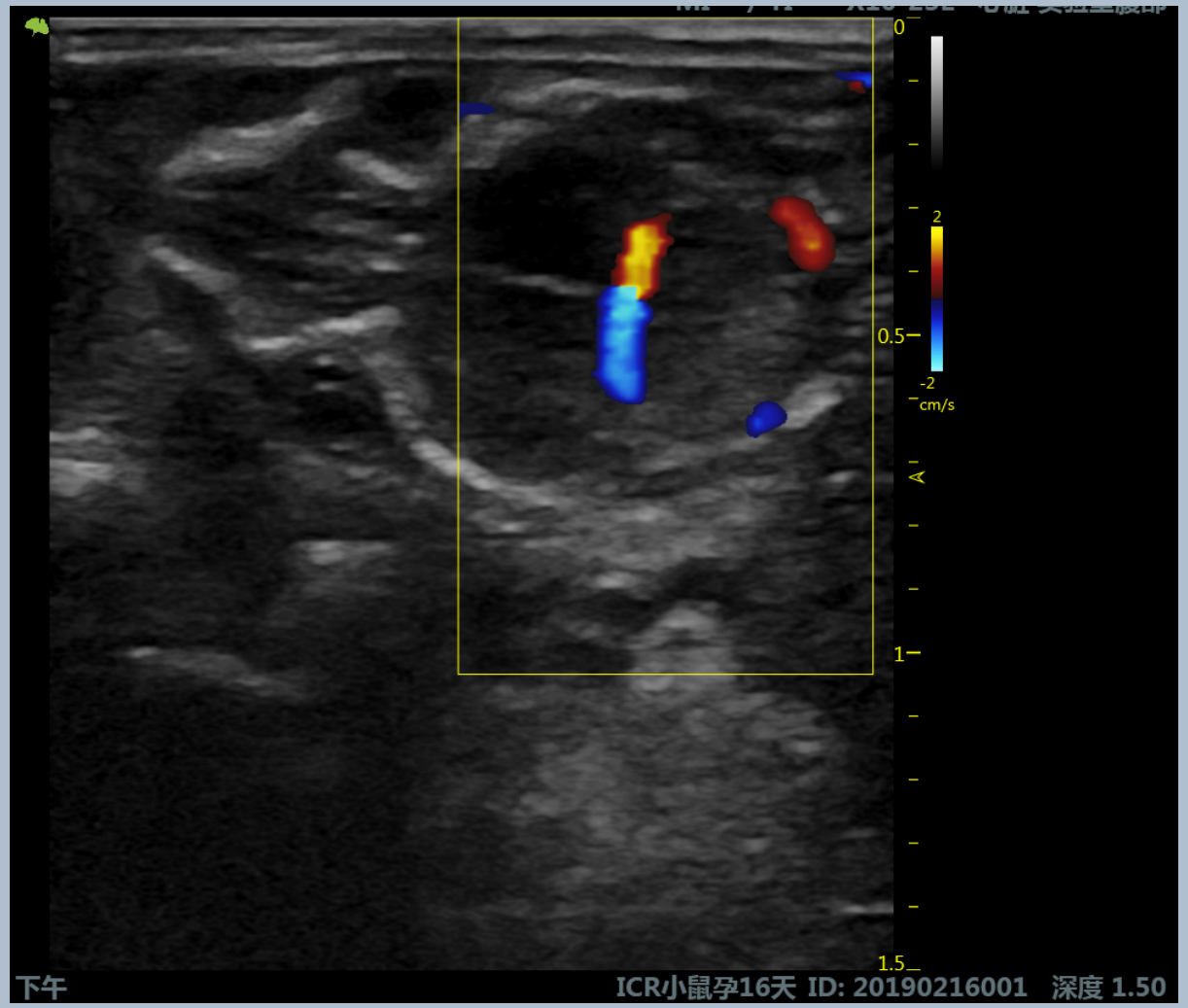




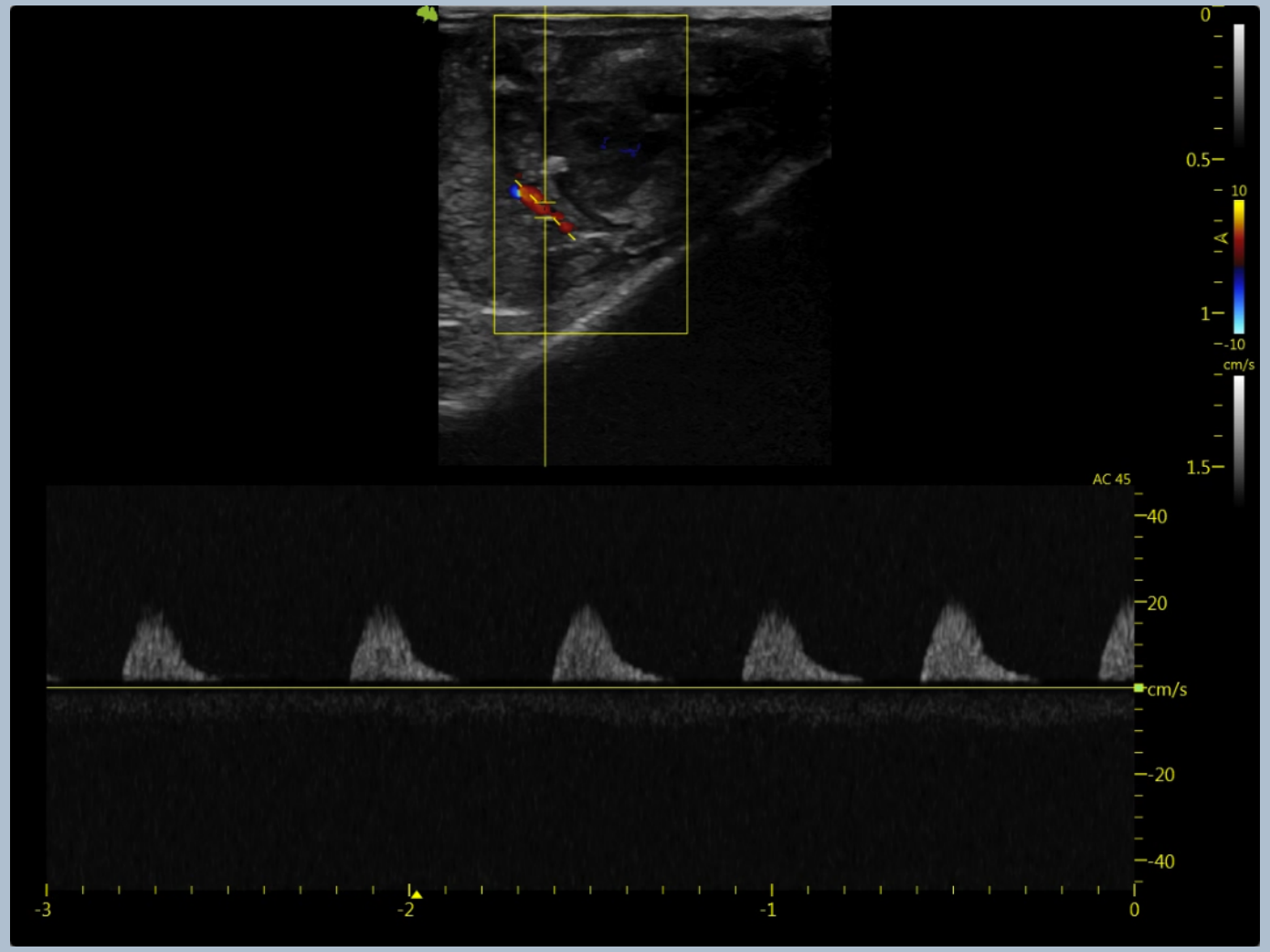
Application Examples

Cerebral blood flow images of fetal mouse



Application Examples

Umbilical Artery Spectrum



Application Examples

Related Articles

frontiers in Immunology

ORIGINAL RESEARCH
published: 04 February 2022
doi: 10.3389/fimmu.2022.821542

Human-Induced CD49a$^+$ NK Cells Promote Fetal Growth

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Specialty section:
This article was submitted to NK and Innate Lymphoid Cell Biology,

CD49a$^+$ natural killer (NK) cells play a critical role in promoting fetal development and maintaining immune tolerance at the maternal-fetal interface during the early stages of pregnancy. However, given their residency in human tissue, thorough studies and clinical applications are difficult to perform. It is still unclear as to how functional human CD49a$^+$ NK cells can be induced to benefit pregnancy outcomes. In this study, we established three no-feeder cell induction systems to induce human CD49a$^+$ NK cells from umbilical cord blood hematopoietic stem cells (HSCs), bone marrow HSCs, and peripheral blood NK cells *in vitro*. These induced NK cells (iNKs) from three cell induction systems display high levels of CD49a, CD9, CD39, CD151 expression, low levels of CD16 expression, and no obvious cytotoxic capability. They are phenotypically and functionally similar to decidual NK cells. Furthermore, these iNKs display a high expression of growth-promoting factors and proangiogenic factors and can promote fetal growth and improve uterine artery blood flow in a murine pregnancy model *in vivo*. This research demonstrates the ability of human-induced CD49a$^+$ NK cells to promote fetal growth *via* three cell induction systems, which could eventually be used to treat patients experiencing adverse pregnancy outcomes.

Keywords: maternal-fetal interface, decidual tissue-resident NK cells, CD49a, low cytotoxic, fetal growth

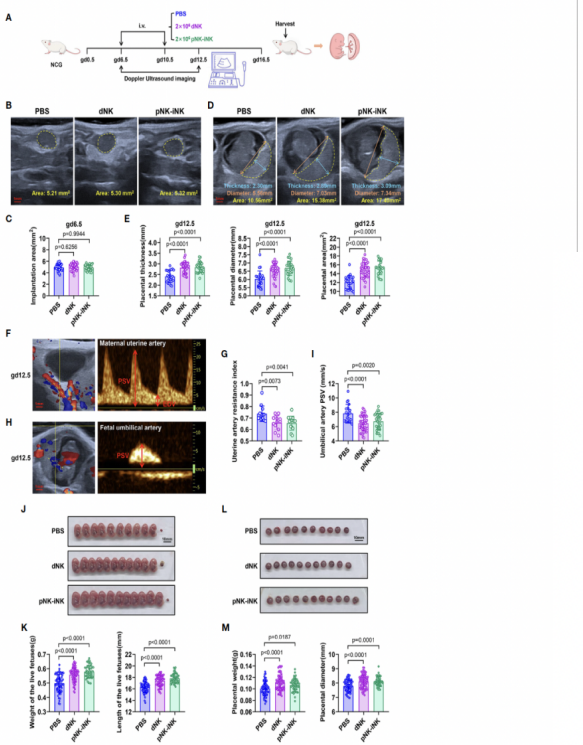


FIGURE 5 | Adoptive transferred pNK-iNK cells promote fetal growth. **(A)** Schematic diagram of adoptive transferring pNK-iNK cells in pregnancy mice model, n=6 pregnancy mice per group. The experiment was performed twice and the results were shown only once. **(B, C)** Implantation areas of pregnancy mice before being transferred cells at gd6.5. Bar, 1 mm. Representative ultrasound images from the three groups **(B)** and statistical calculations **(C)** are shown. Results are presented as individual values for each implantation and mean. **(D, E)** Placental measurements at gd12.5. Bar, 1 mm. **(D)** Representative ultrasound image of the single fetus, showing placental thickness, placental diameter, and placental area. **(E)** Statistical calculation of the measurements is shown. Results are presented as individual values for each placenta and mean. **(F–I)** Analysis of blood flow velocities at gd12.5. Bar, 1 mm. Representative CF (left) and PW (right) doppler images showing PSV and EDV of UA **(F)** and UmA **(H)**. **(G)** Statistical calculation of UA resistance index (2 experimental repeats were combined). **(I)** Statistical calculation of UmA peak systolic velocities. **(J–M)** The pregnancy outcome of adoptive transferring NK cells in mice. Bar, 10 mm. **(J)** Representative pictures of fetuses from NK-cells transferred mice and control mice (PBS transferred) at gd16.5. **(K)** Statistics were calculated by the weight and length of the live fetus in different groups. **(L)** Representative pictures of the placenta correspond to the fetus in **(J)**. **(M)** Statistics were calculated by the weight and diameter of the placenta. Data represent means ± SD. Data were analyzed by one-way ANOVA **(C, E, G, I, K, M)**.

Doppler Ultrasound Imaging

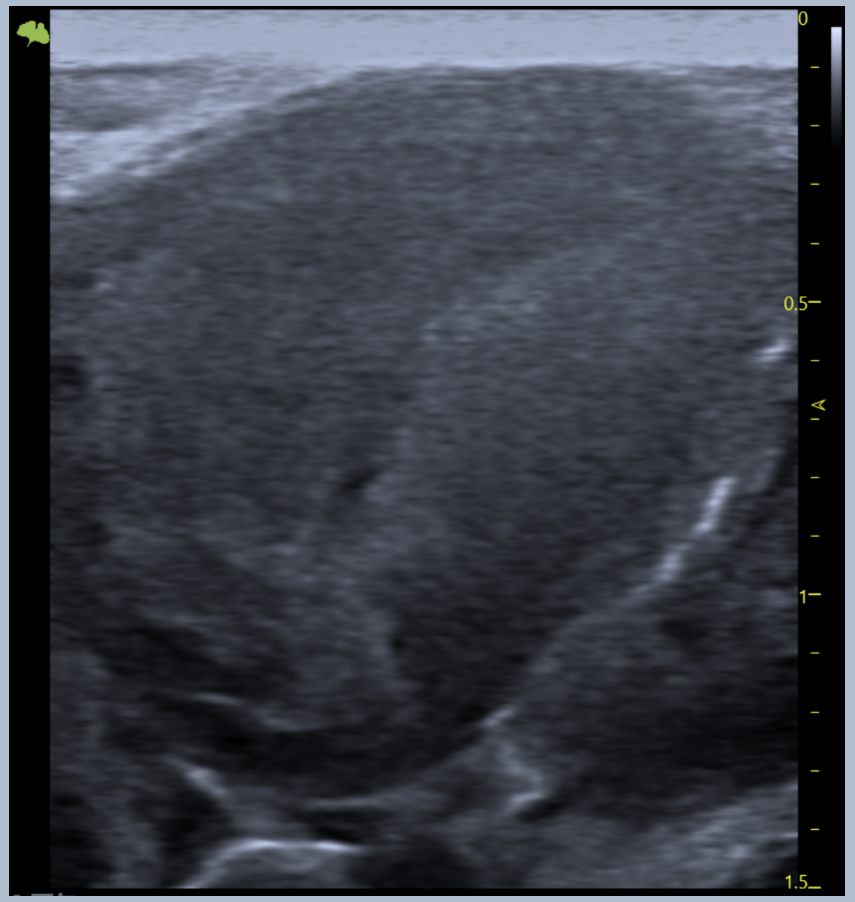
A Vinno 6 performance real-time ultrasound scanner (Vinno Corporation, Suzhou, China) was used for ultrasound measurements. The pregnant mice were anesthetized *via* intraperitoneal injection of 2% pentobarbital sodium and positioned on a warm platform to maintain euthermia. The abdominal hair was removed with a depilatory agent. Pre-warmed ultrasound gel was applied to the depilated abdomen skin, while the bladder was used as a reference point to move the transducer to the abdomen and trace implantations. B-Mode was used to measure implantation areas at gd6.5 and placental conditions (thickness, diameter, and area) at gd12.5 in a 2D grayscale image. CF-Mode was used to visualize blood flow in the maternal uterine artery (UA) and fetal umbilical artery (UmA) at gd12.5. The pulsed wave doppler sample volume was adjusted and subtle positional changes of the transducer were made to obtain the blood flow

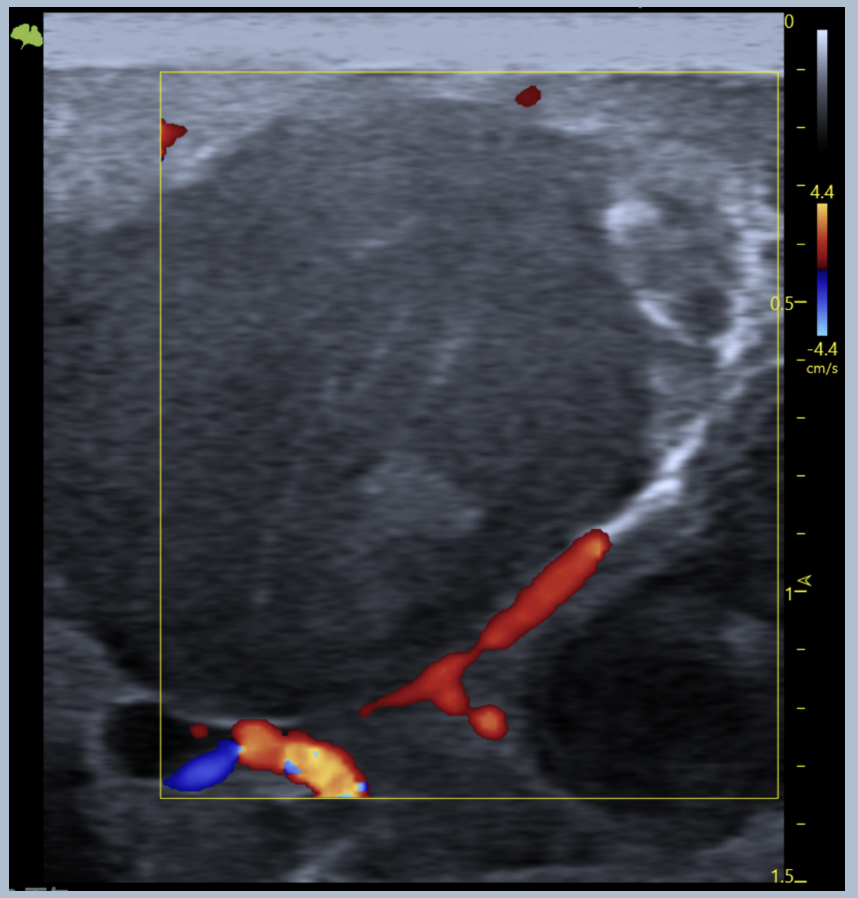
5.oncology

The tumor tissue can be accurately detected without any markers, and its arbitrary radial distance, area and volume can be measured.

Application Examples

Mouse Abdominal Tumors



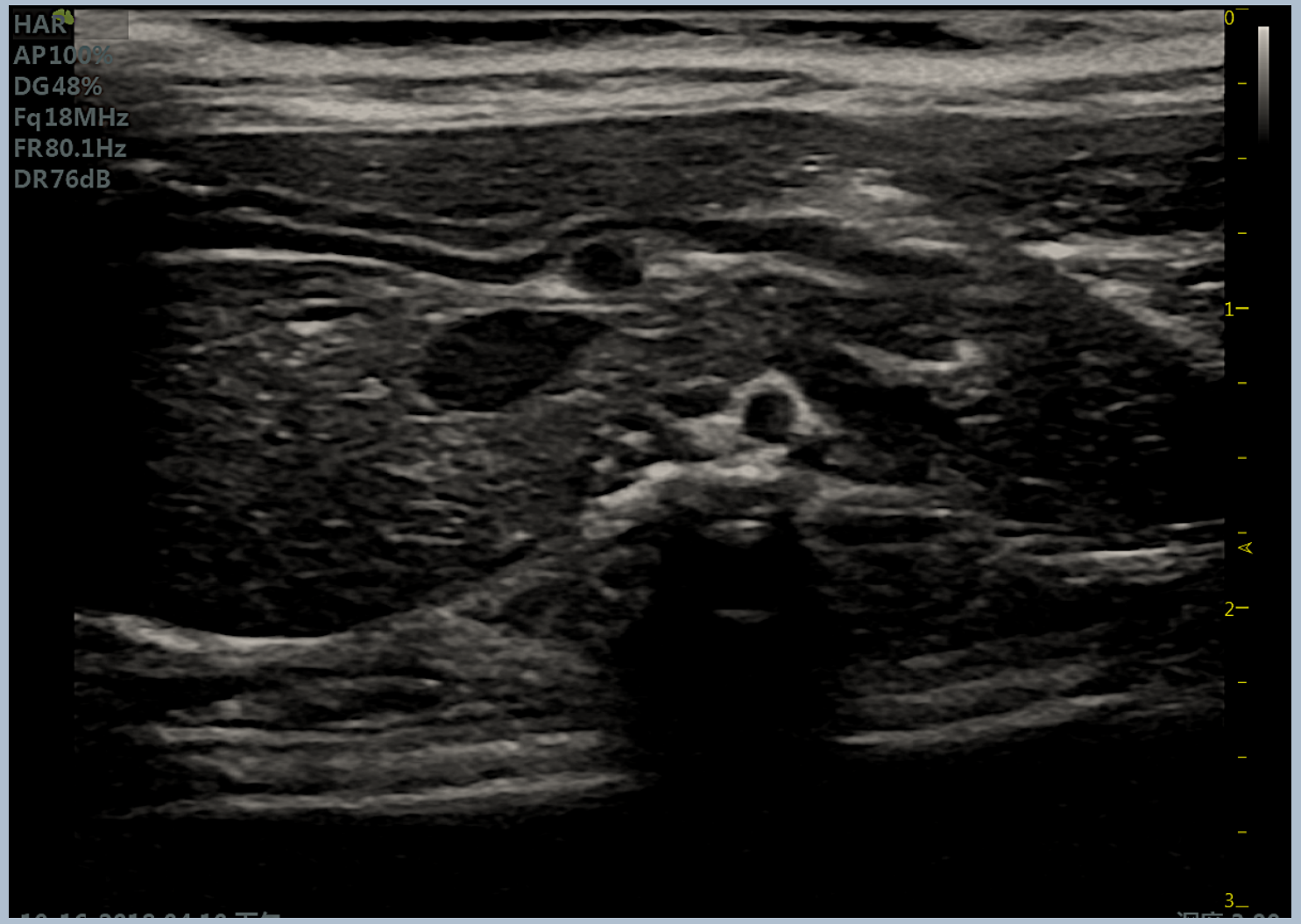


6.Abdominal viscera

High-resolution two-dimensional imaging of liver, kidney, intestinal tract and other tissues and organs of various animals such as rats and mice, real-time detection of blood flow and perfusion imaging in vivo.

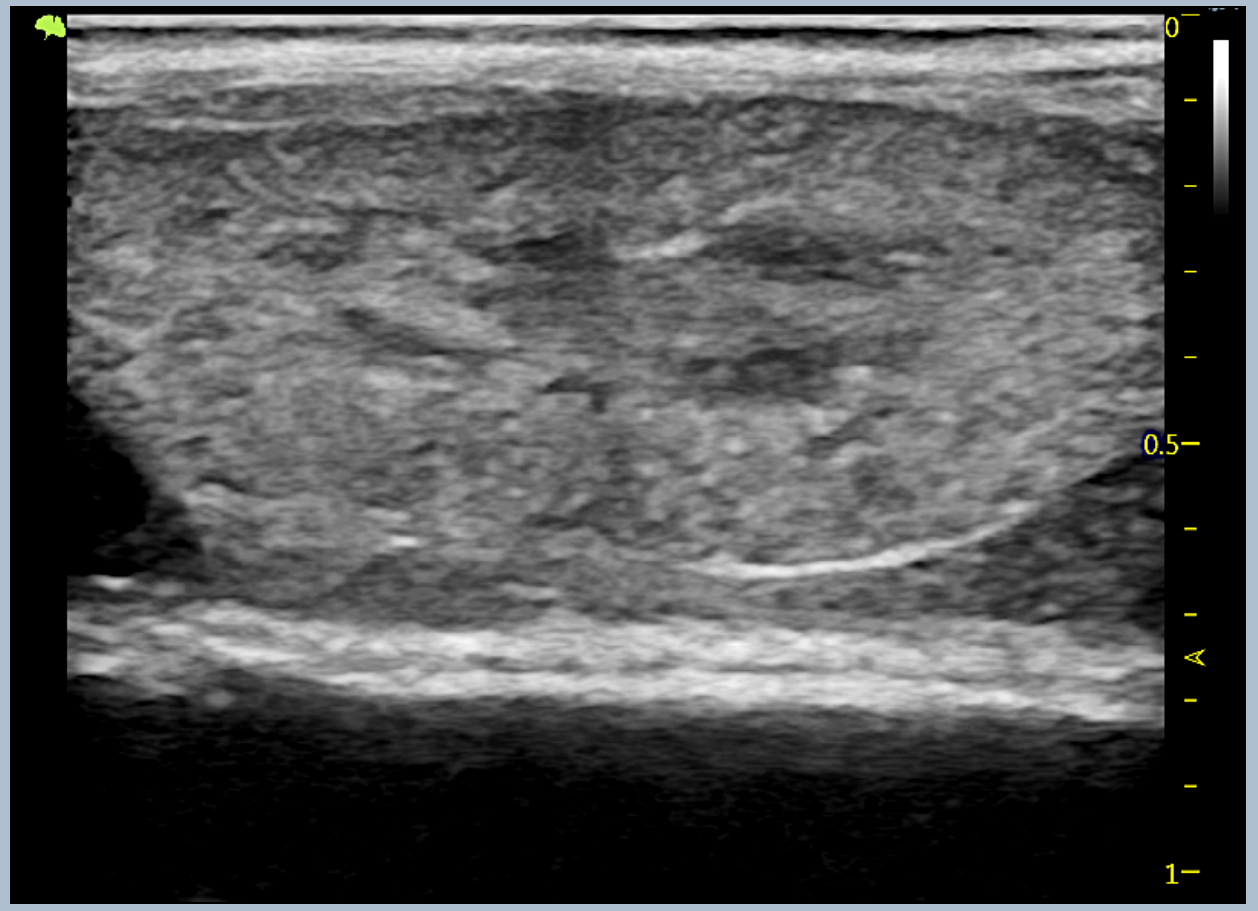
Application Examples

Rat liver



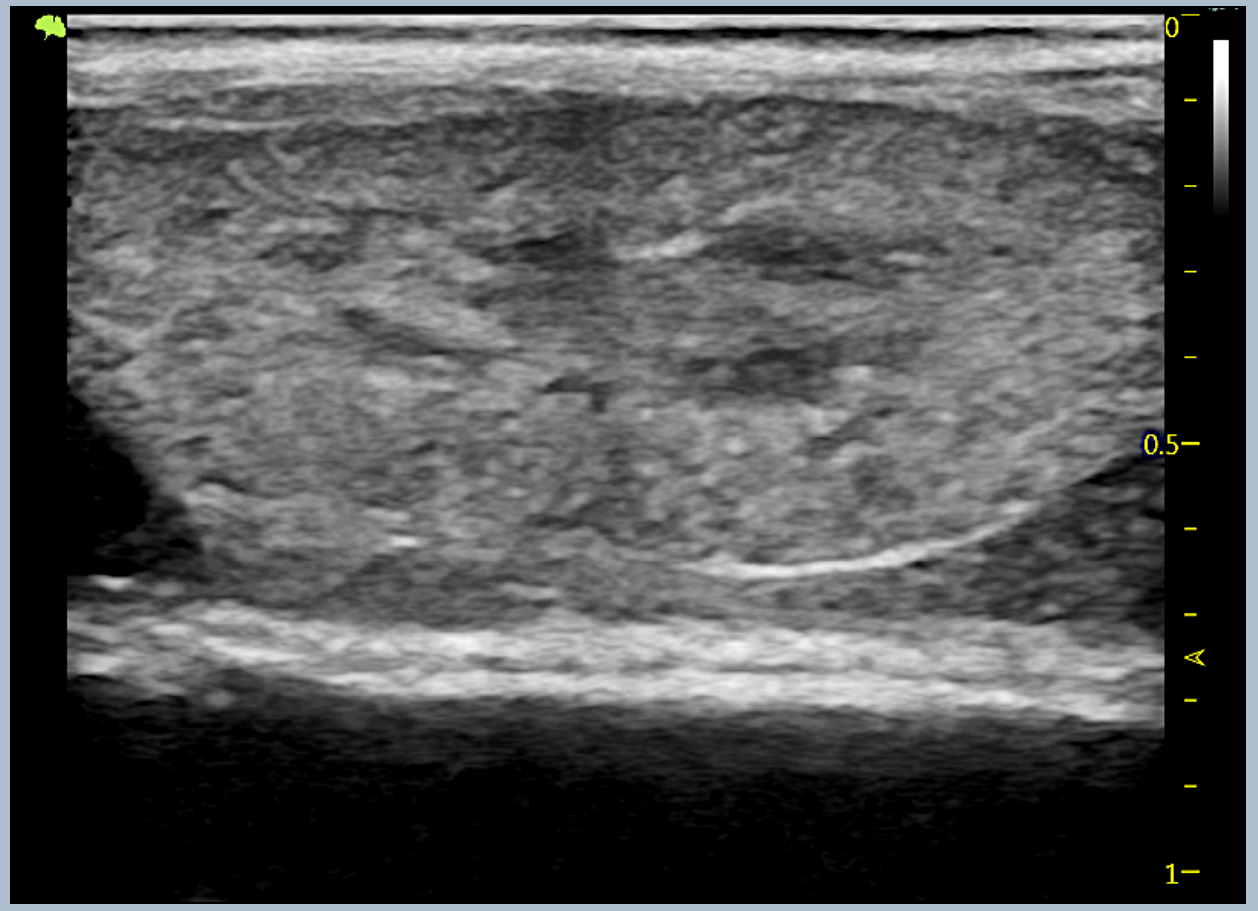
Application Examples

mouse kidney



Application Examples

mouse kidney



7.Respirology

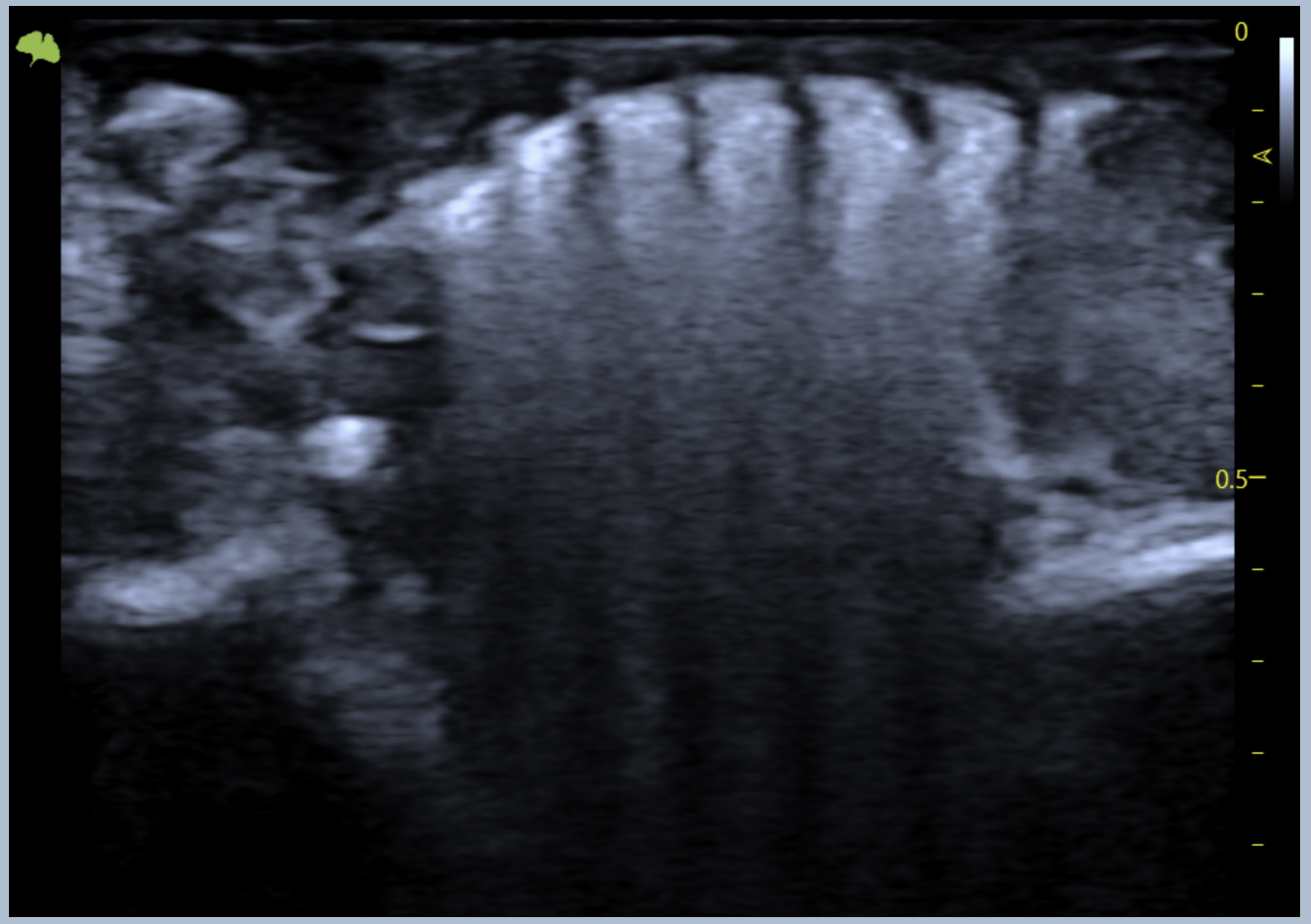
Pulmonary ultrasound can be used for assessment：

1. breathe hard 2.pneumonia or other recurring infections 3.cardiogenic pulmonary edema 4. acute respiratory distress syndrome 5. COPD/Asthma

6.pneumothorax

Application Examples

Mouse Lung Ultrasound



05

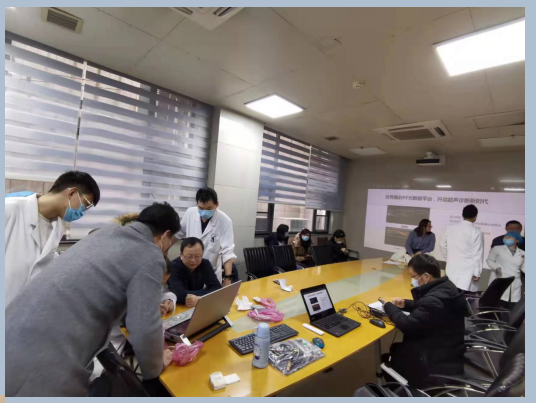
Customer Service

Demonstration and Trial

Installation Training

Advcanced Training



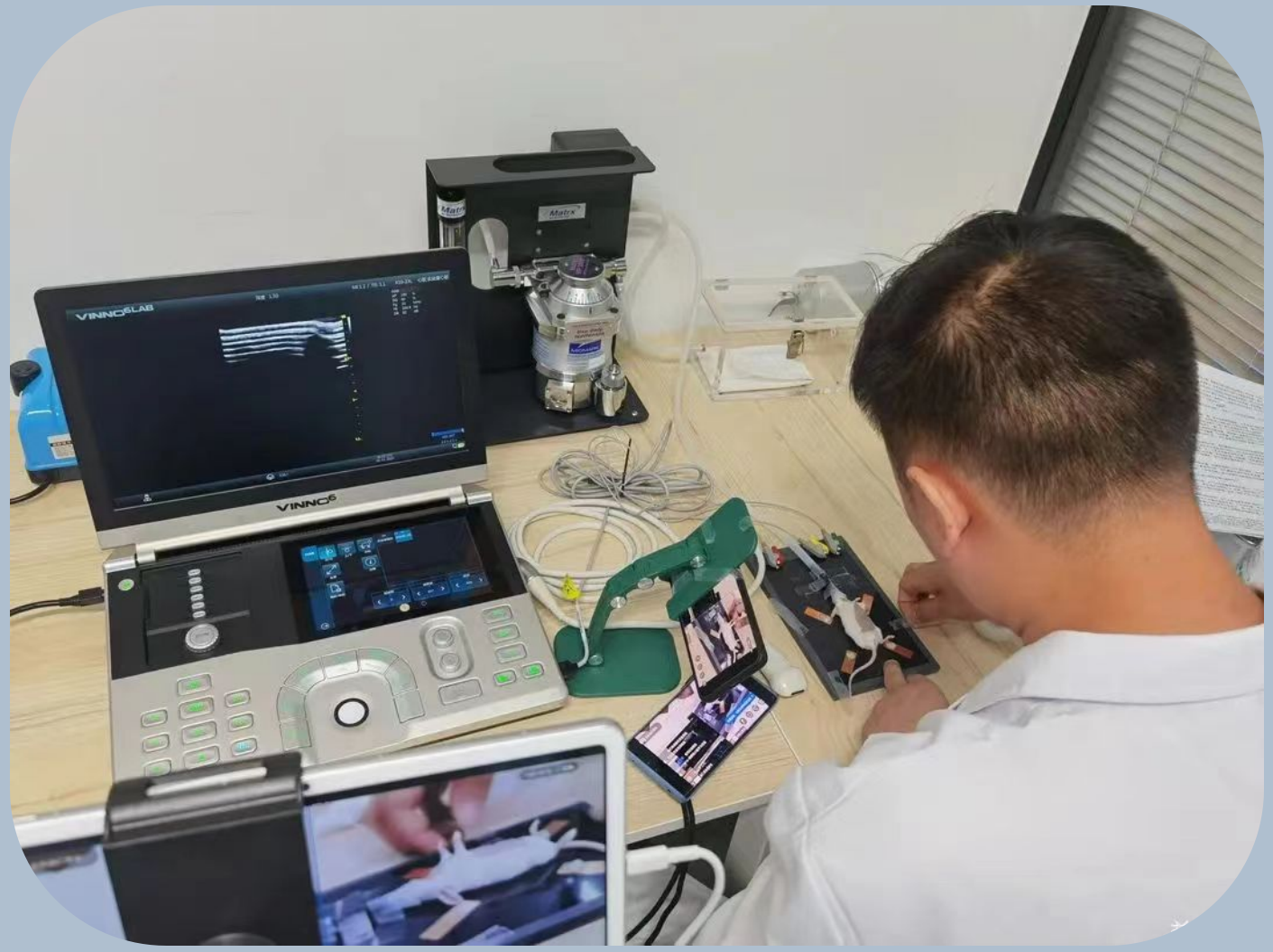



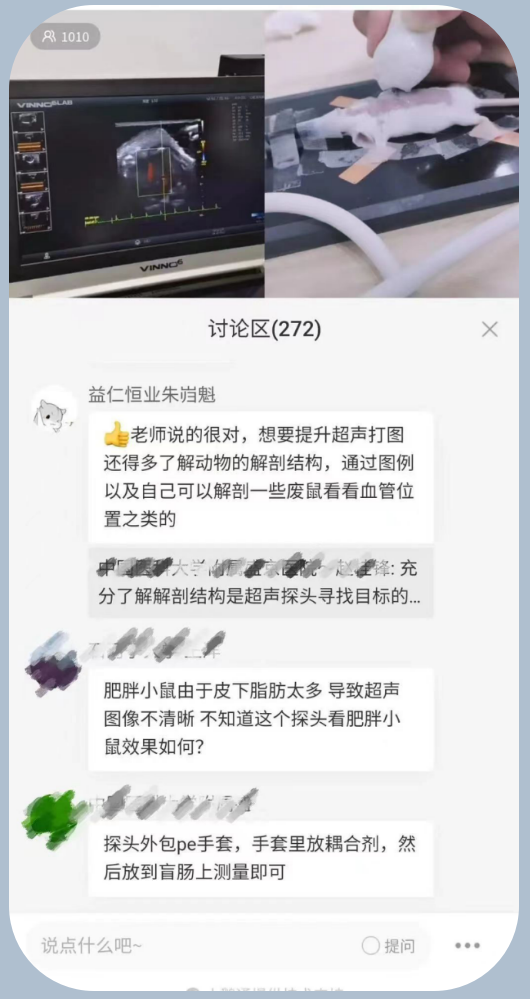







● 1V1 on-line Training ●





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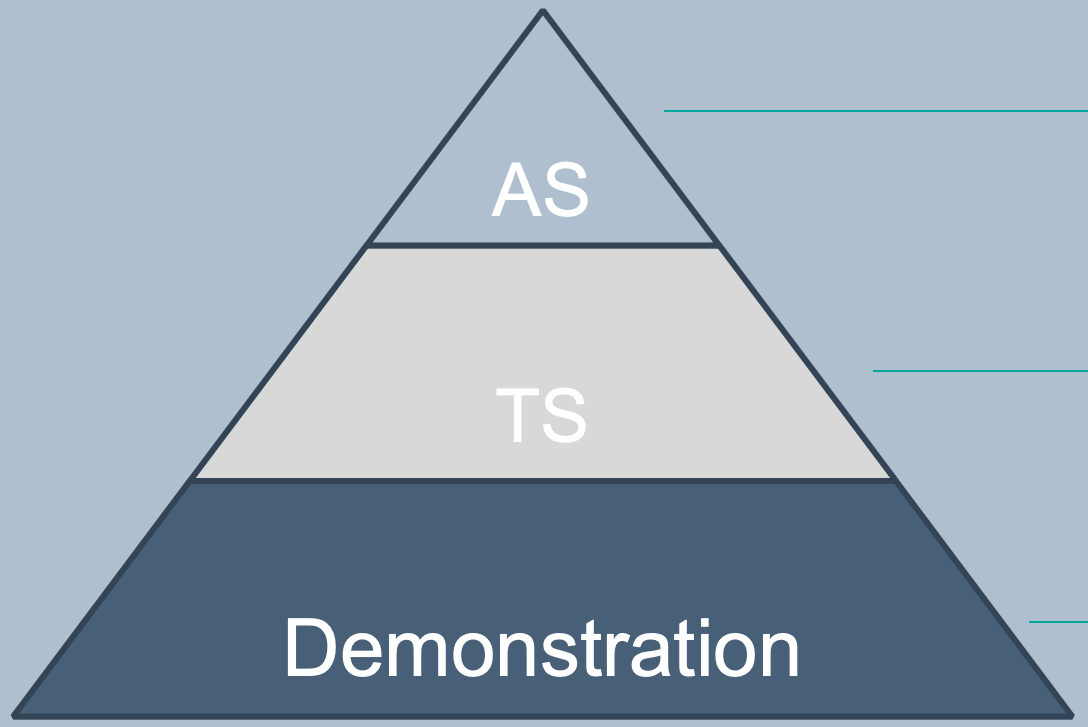

1 Aftersales Service

2 Technical Support

3 Demonstration

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Thanks