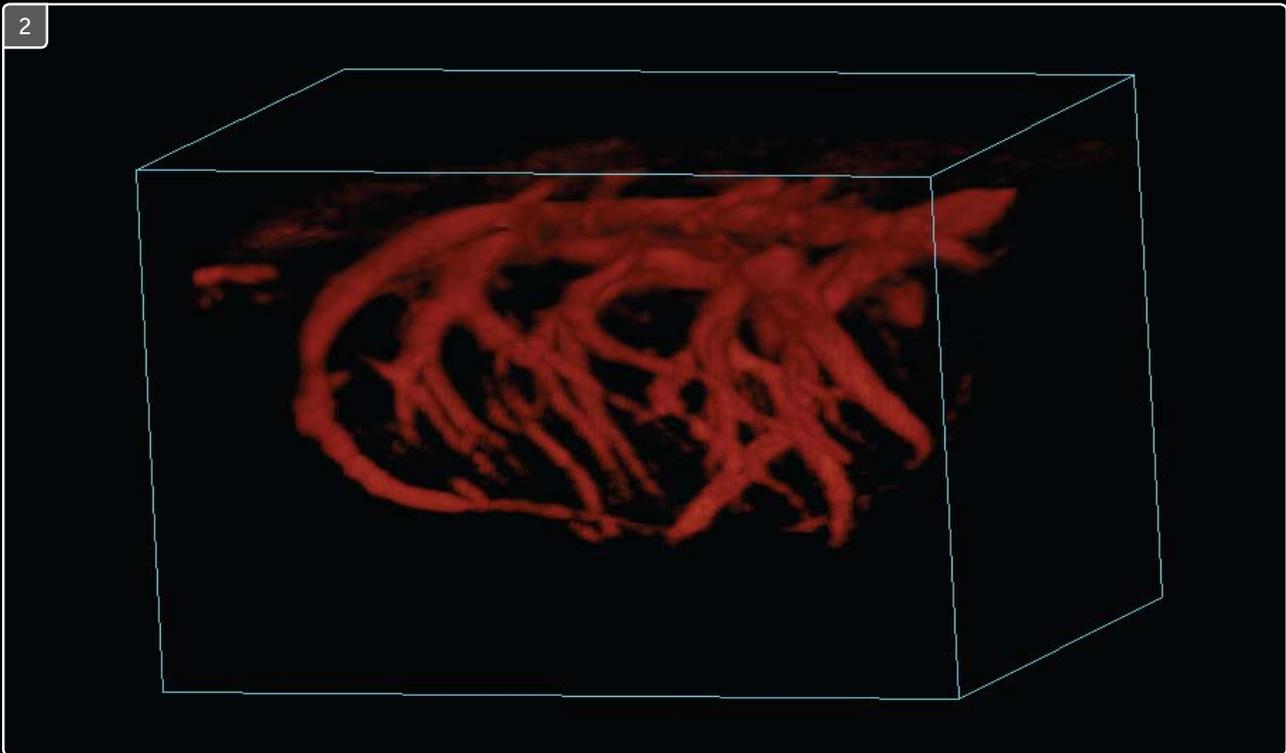
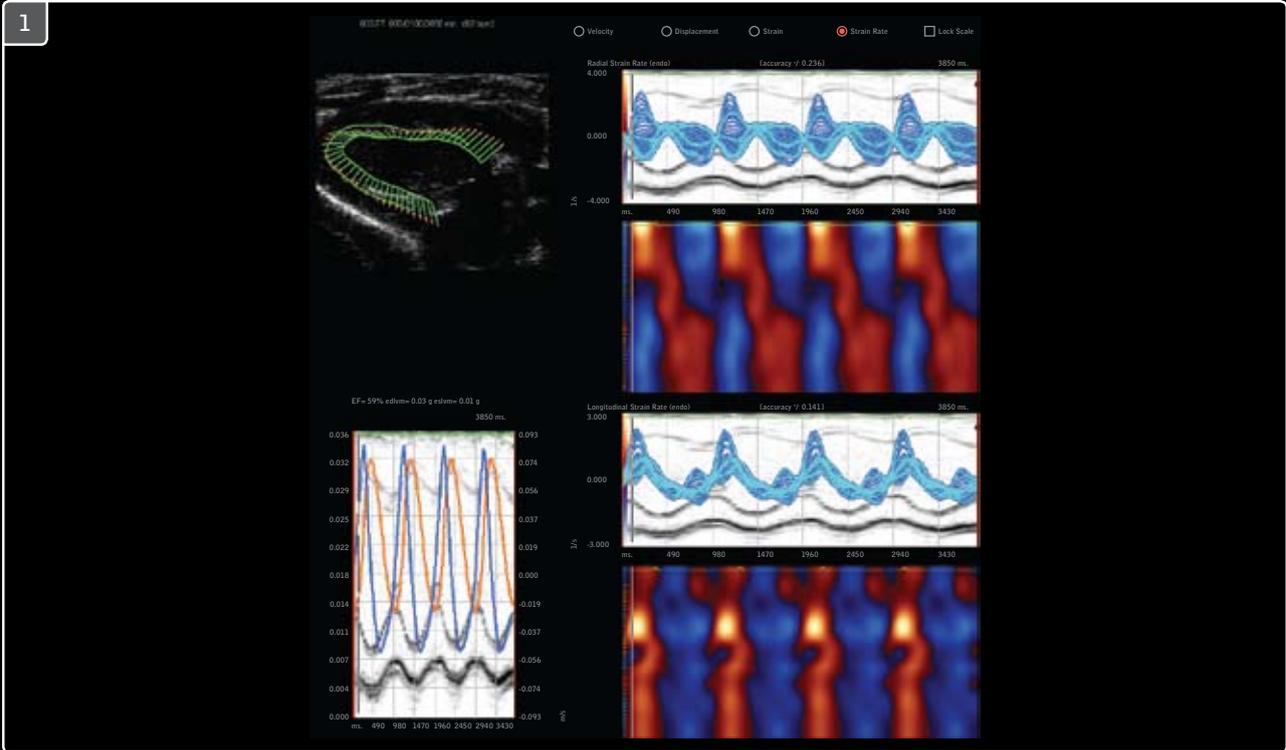




VISUALSONICS

# Redefining Preclinical Imaging





1. VevoStrain Analysis tracks the motion of the myocardium and aids in quantification of function and contractility. Semi-automated analysis of a mouse parasternal long-axis view shows magnitude vectors of segmental motion, the radial and longitudinal components of strain rate, M-Mode calculation of LV volume with % ejection fraction and LV mass.

2. 3D Power Doppler highlights the vasculature of this mouse testicle. 3D provides greater orientation to surrounding anatomy.

“ A whole new dimension in preclinical imaging intelligence ”

## VisualSonics

VisualSonics was founded to develop advanced imaging platforms for small animal research. High anatomical resolution, physiological and microcirculation quantification, and molecular data have enabled scientists worldwide to visualize and measure what was previously unattainable.

As the undisputed leader in realtime *in vivo* micro-imaging systems, VisualSonics once again advances the most widely accepted imaging modality in preclinical research today.

VisualSonics redefines state-of-the-art with a new digital platform delivering outstanding performance in a wide range of applications and models.

The Vevo<sup>®</sup> 2100 expands the functionality, flexibility and image quality while operating at frequencies never before achieved with solid-state array transducers.

The new MicroScan transducers provide increased frame rates, superb contrast and unrivaled detail resolution, a wider field of view and comprehensive analytics. The system is easy to use, non-invasive and fast, providing extremely high throughput when needed. The best in class digital imaging platform also has built-in expansion for future capabilities.



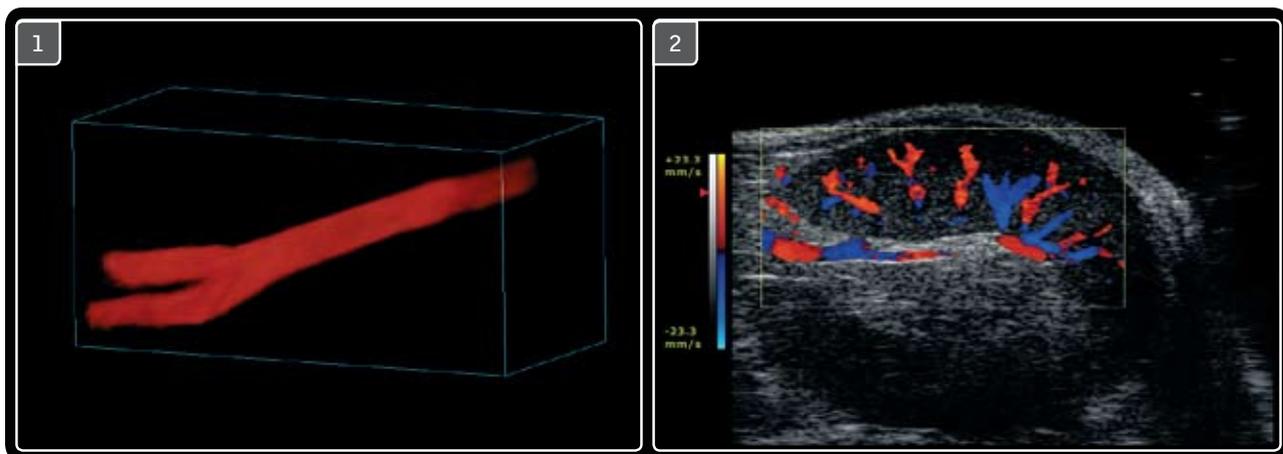
Study a wide range of models from embryos to adults



## High-Resolution Ultrasound Imaging

### Anatomical, Functional, Molecular Data

- Highest available resolution in realtime, dynamic screening with unmatched temporal resolution
  - » Greater accuracy & reproducibility
  - » Image anatomy & hemodynamic detail
  - » Allows increased throughput
- Non-invasive
  - » Longitudinal studies with same animal as control
- Reliable, quantifiable, repeatable data
  - » Extensive measurements & capabilities
  - » Quantify with precision
- Simple to use. Easy to learn.
  - » Instantaneous imaging
  - » Reproducible across operators
- Flexible, expanded applications across research areas
- Precision-targeted image-guided interventional procedures for greater accuracy
- Translational – mouse to man



3D Power Doppler of mouse carotid artery and branches

Color Doppler helps assess blood flow direction and mean velocity in this mouse spleen





“ See things you haven't seen before ”

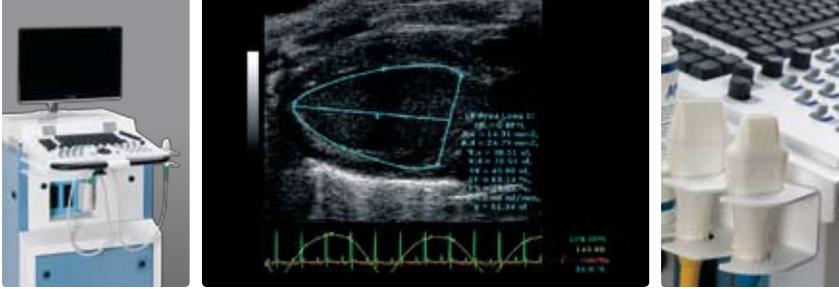
## The Vevo 2100 Imaging Platform

Sophisticated technology. Simple to use.

The first high-frequency, high-resolution digital imaging platform with linear array technology and Color Doppler

- Superior resolution and image uniformity through entire field of view
- 30 micron resolution
- Frame rates up to 1000 fps
- Wide field of view for better orientation & to see larger structures
- Color & Power Doppler for blood flow quantification & anatomical identification
- Versatile
  - » Multiple research areas: Cardiovascular, Cancer, Developmental Biology, Contrast Imaging, Regenerative Medicine, Drug Development, Urology, Reproductive Medicine
  - » Multiple animal models: mouse, rat, rabbit, zebra fish, chick embryo & others
- 3D Imaging & Volume Analysis
- Advanced measurements & quantification
- Open architecture data management
- Mobile—true plug & play for any lab
- Upgradable platform





“ A new era in *in vivo* realtime high-resolution preclinical imaging ”

## The Vevo 2100 Imaging Platform

Easy to use and quickly setup in any lab.

Smart interface — rapid imaging with one button presets.

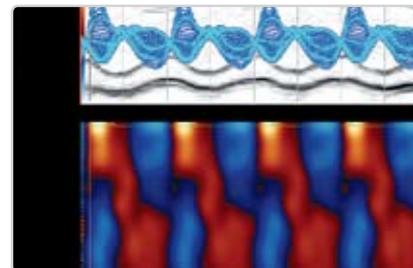
### Imaging

- Superb B-mode (2D) imaging with frame rates up to 1000 fps with multiple focal zones for enhanced image uniformity
- M-mode assesses motion in cardiovascular applications
- Pulsed-wave Doppler (PW) for blood flow quantification
- Color Doppler shows flow direction, mean velocities & identifies small vessels not seen in B-mode
- Power Doppler for relative quantification of blood flow
- Simultaneous modes and steering for easier & faster studies
- MicroMarker™ Contrast Imaging – for relative perfusion & targeted molecular data
- 3D Imaging, rendering, reconstruction & volume analysis



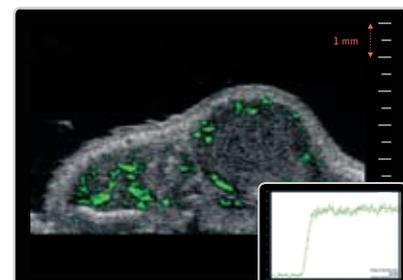
### Analysis Software

- Extensive measurement packages
- Premium Cardiac Analysis Package
  - » ECG Triggering/Respiration Gating
  - » VevoStrain™ analysis for the assessment of global & segmental myocardial function
- 3D volume analysis



### Data Management

Analyse, annotate and archive images and studies through a flexible, open-architecture system. Track and trend imaging and measurement data, compare studies side-by-side. Vevo workstation and software supports industry standard Dicom 3.0, providing fast analysis and production of research data.





## The Vevo MicroScan Transducers

A new perspective with color.

VisualSonics presents the world's first ultra-high frequency linear array technology. The solid-state, patented transducers are customized specifically for animal research. The ergonomic design provides the ultimate in high-resolution imaging and maximum utility for small animal data acquisition.

### MicroScan transducers:

- Fast image acquisition
- Wide field of view – screen multiple organs
- Dynamic electronic focusing
- Multiple focal zones – uniformity through image
- Allows direct contact scanning of animal for enhanced imaging
- Doppler steering – allows better detection & quantification of vessels
- Scan conscious animals

Multiple MicroScan transducers, ranging in frequency from 9 – 70 MHz, are available and optimized for specific research applications.

Animal	Transducer	Application
	<b>MS200</b> 9–18 MHz	Cardiovascular, Abdominal; Larger Animal > 500g
	<b>MS250</b> 13–24 MHz	Large Tumor (< 23mm); Cardiovascular, Abdominal < 250g
	<b>MS400</b> 18–38 MHz	Cardiovascular, Abdominal; Rabbit Eye
	<b>MS500D</b> 22–55 MHz	Abdominal, Embryo, Vascular Tumors (Up to 14mm)
	<b>MS550S</b> 32–56 MHz	Embryo, Abdominal, Vascular, Epidermal Imaging, Tumors (< 13mm), Ophthalmology
	<b>MS700</b> 30–70 MHz	Epidermal Imaging, Superficial Tissue, Subcutaneous Tumors (< 9mm), Vascular, Ophthalmology



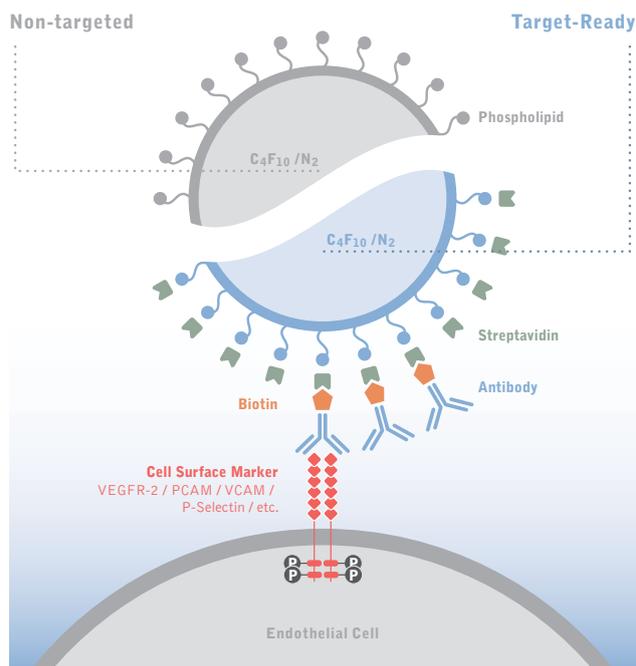


## MicroMarker™ Contrast Agents

Optimized for Quantitative, Reproducible Results

MicroMarker contrast imaging is a major breakthrough for perfusion and targeted molecular imaging. Providing enhanced perfusion studies of anatomy and microvasculature, researchers now have the ability to target and quantify molecular biomarkers of disease *in vivo* longitudinally.

MicroMarker Contrast Agent Kits are optimized for small animal imaging. The complete kits provide a turn-key solution with contrast agents, reagents and detailed protocols to support research and drug development efforts.



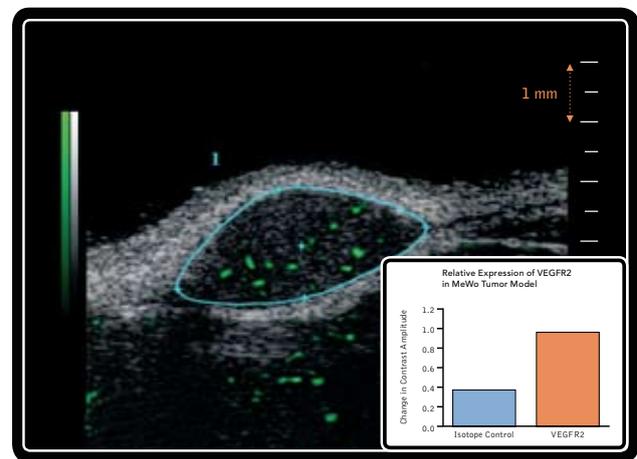
### Relative Perfusion

- Vevo MicroMarker Non-Targeted Contrast Agents – tissue enhancement, perfusion & micro-circulation applications
- Vevo MicroMarker DEPO® Contrast Agents assess myocardial viability and quantify infarctions

### Target-Ready Molecular Imaging

- Vevo MicroMarker Target-Ready Contrast Agents – quantify biomarker expression

The Vevo 2100 shows resolution to 30 microns. MicroMarker contrast agents extend the detectability to 2-3 microns.



Quantification of relative expression of VEGFR2 in a subcutaneous tumor on the hindlimb. The isotype control antibody was included to assess the level of non-specific binding in this assay.



# Vevo Imaging Station



Comprehensive Imaging Station

The Vevo Imaging Station simplifies animal handling and positioning. Combining integrated physiological monitoring with animal body temperature maintenance and controlled anesthesia delivery, optimal conditions are maintained throughout the imaging session. This total imaging station standardizes image acquisition and quantification to ensure repeatable, reproducible results and high-throughput workflow for multiple animal studies.

- Warmed platform for maintaining optimal physiological conditions for mice and rats
- Integrated & displayed physiological monitoring – ECG, heart rate, core temperature, respiration, blood pressure
- Transducer mounting system – for precision, accuracy and hands-free scanning
- 3D positioning system
- Reduces time administering anesthesia
- Capture reproducible results in a controlled environment

## Dedicated micro-injection system

The image-guided precision micro-injection system provides a simple and efficient method for injections or extraction procedures.

## Integrated anesthesia system

A table-top or mobile compact isoflurane-based anesthesia system is available. Optimized for small animal anesthesia, the system includes rodent induction chambers, nose cone application and is integrated into the Vevo Imaging Station.

## Easy to use

- Fine-tune acquisition with precise control
- Reproducible for large cohort studies
- Reduce intra-operator variability



Anesthesia System



Mouse & Rat Table



Image Acquisition

“ Visualize. Analyze. ”



# Vevo SoniGene™ System

## Low-Frequency Sonoporation Device

Enhance Gene Delivery – the SoniGene system delivers a low-frequency/high-powered ultrasound pulse that allows the gene or drug to transfect.



## Vevo Scientific Support

The advanced technology of the Vevo 2100 high-resolution imaging system is supported by an equally sophisticated approach to service and support. The VisualSonics team provides expert training and applications support and is committed to maintaining system performance. VisualSonics offers a broad range of service solutions that meet your needs.

### Applications Support and Training Customized to Your Needs

- Customer training
- Vevo Imaging Courses
  - » MicroMarker contrast imaging
  - » Abdominal and 3D techniques
  - » Cardiovascular imaging
  - » Doppler and vascular techniques
- Symposia – associated with major conferences

### Online Learning Center and Customer Website <http://www.visualsonics.com>

- Find publications, protocol guides, imaging guides & training videos
- Private, secure
- VisualSonics moderated forums allows users to ask questions and share their experience with the Vevo systems

### Technical Support

VisualSonics provides on-going Service and Technical Support with our team of experienced and certified professionals.

[support@visualsonics.com](mailto:support@visualsonics.com)



Performance and Reliability You Expect







## VISUALSONICS

Advancing preclinical research

### CORPORATE HEADQUARTERS >

3080 yonge street suite 6100  
box 66 toronto canada M4N 3N1

### U.S. >

100 Park Avenue, Suite 1600  
New York, NY 10017

### EUROPE >

VisualSonics BV  
Science Park 406  
1098 SM AMSTERDAM  
The Netherlands

### WEBSITE >

[www.visualsonics.com](http://www.visualsonics.com)

### TELEPHONE >

+1 416 484-5000

### TOLL FREE >

North America

1.866.416.4636

Europe

+ 800.0751.2020

Cardiovascular  
Cancer  
Developmental Biology  
Diabetes  
Neurobiology  
Reproductive Biology  
Regenerative Medicine  
Ophthalmology  
Molecular Imaging  
Orthopedic  
Gene Delivery