

# Vevo<sup>®</sup> LAZR-X

High Resolution Multi-modal in vivo Imaging Platform



# Vevo<sup>®</sup> LAZR-X

## The world's *only* customizable imaging platform combining ultra high frequency ultrasound and photoacoustics

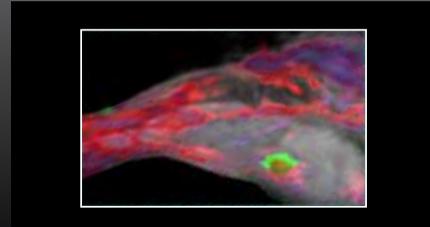
Experience the next generation of in vivo multi-modal imaging where volumetrics, hemodynamics, oximetry and biomarker detection are all at your fingertips.

- Fusion of anatomical, functional and molecular data
- Superior resolution (down to 30  $\mu\text{m}$ )
- Customizable touch-screen interface
- Compact and portable system
- Open access imaging environment

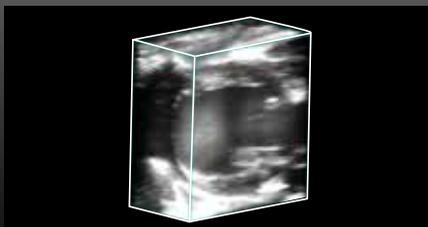
Explore the possibilities in...



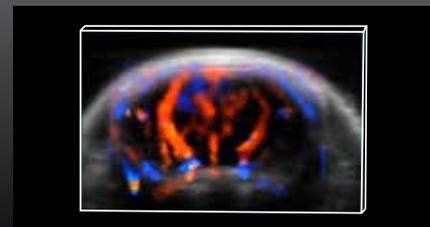
Oncology



Molecular Biology



Cardiology



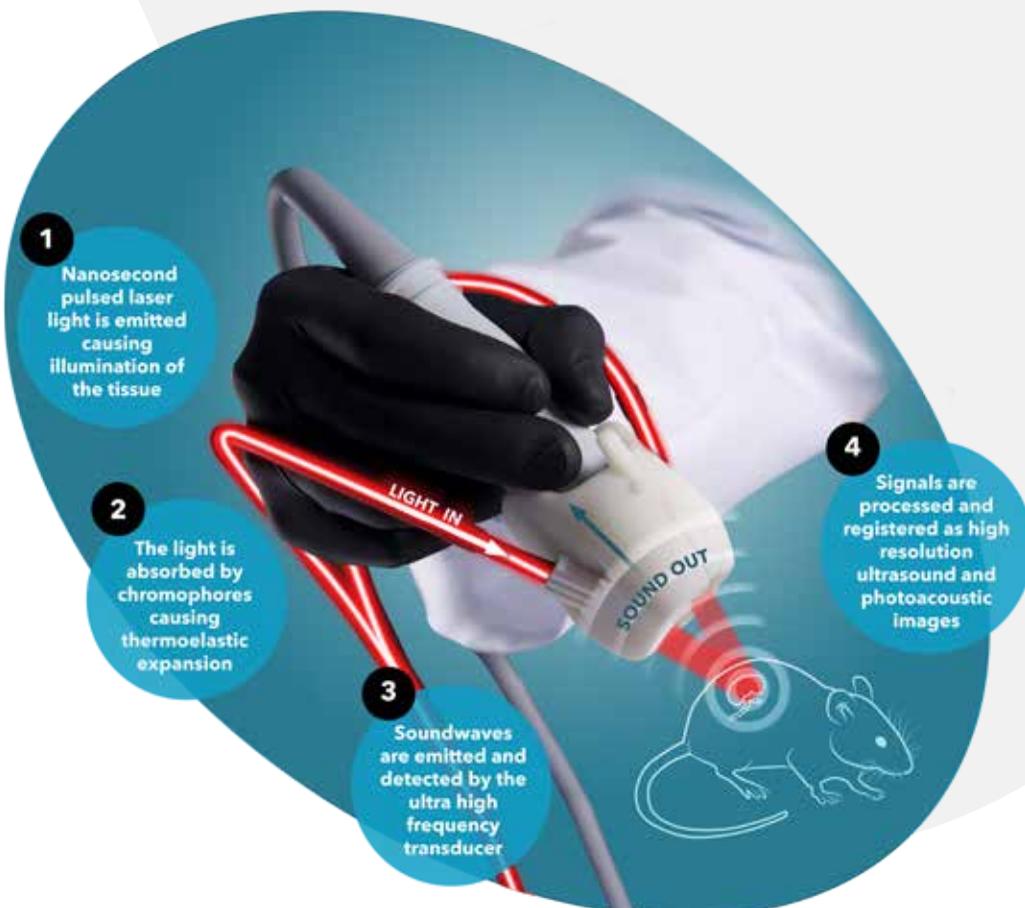
Neurobiology

(See page 6 for more details)



## What is photoacoustics?

The photoacoustic effect is the generation of sound by the absorption of pulsed light.



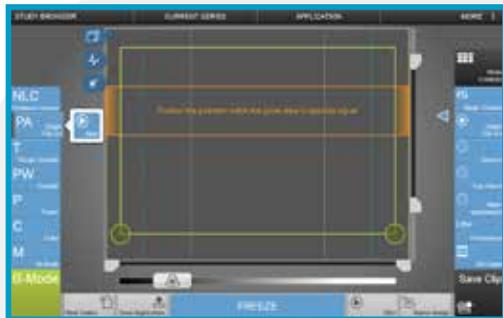
## Benefits of photoacoustic imaging with the Vevo LAZR-X

- Deep, optical signals visible with high resolution and in real-time
- Multispectral acquisition for imaging multiple components simultaneously
- Non-invasive for longitudinal studies
- Co-registration with detailed ultrasound anatomical images
- Real-time assessment of functional data such as oxygen saturation, contrast agent distribution, pharmacokinetics and more

# Vevo<sup>®</sup> LAZR-X

## Multi-Modal Imaging Platform

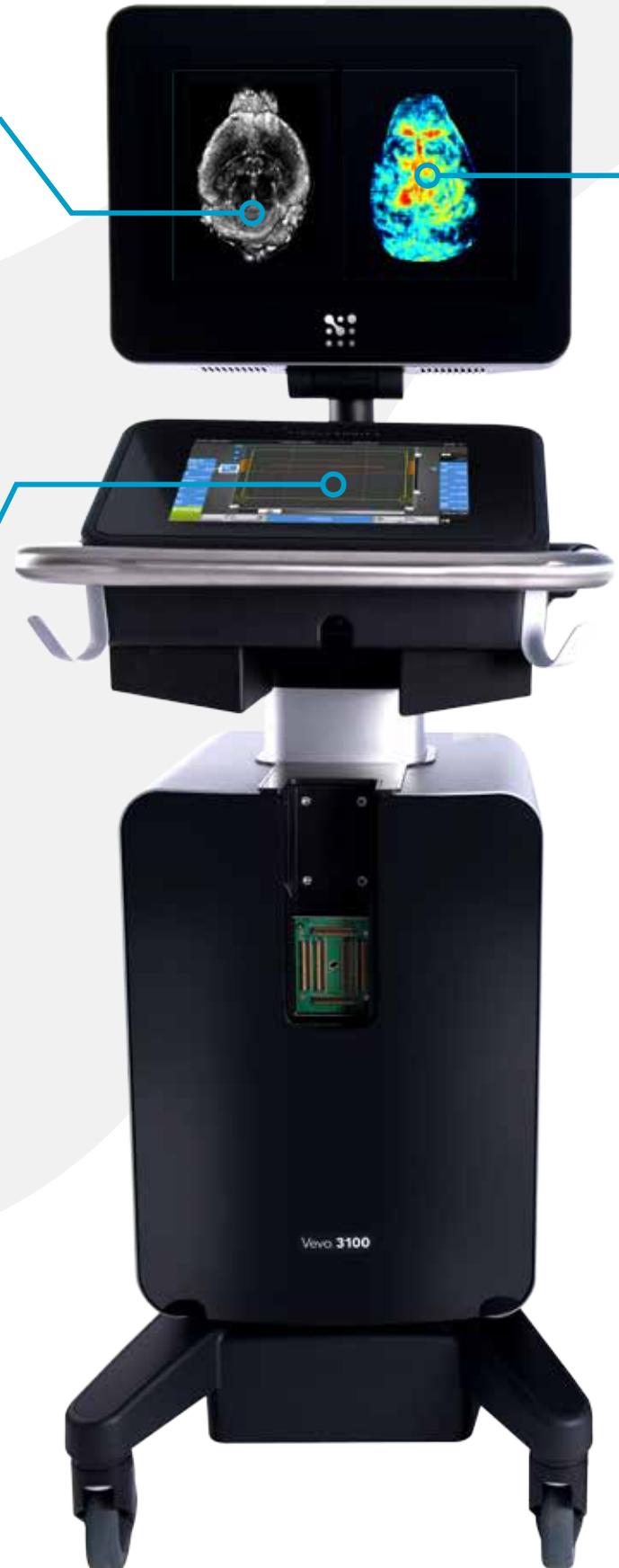
Fusion of ultrasound with nonlinear contrast, Doppler and photoacoustic modes



Customizable user interface

Ease-of-use with one-touch acquisition

User-defined workflow for high throughput



Vevo 3100

# PORTABLE, CUSTOMIZABLE, TRUSTED TECHNOLOGY

Trusted Vevo technology used  
in hundreds of research labs

State-of-the-art ultra high frequency  
electronics operating up to 70 MHz

Resolution down to 30  $\mu\text{m}$



Dual wavelength ranges  
including signal (680-970 nm)  
and idler (1200-2000 nm)

Advanced laser technology  
for fast and sensitive acquisition

Small, compact, portable design

## LAZR-X Cart

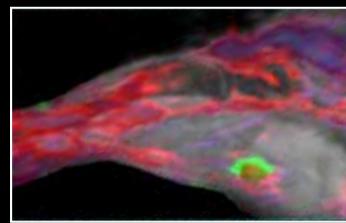
## Multi-Modal Imaging for Exceptional Translational Research



Nonlinear contrast image of a subcutaneous tumor showing vascular perfusion.

### Oncology

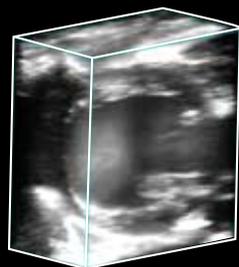
- Tumor detection and sizing in 2D and 3D
- Vascularity and perfusion
- Tumor model characterization
- Response to therapy
- Hypoxia



3D mouse hindlimb showing spectrally unmixed photoacoustic image of oxy hemoglobin (red) deoxyhemoglobin (blue) and an optical dye (green).

### Molecular Biology

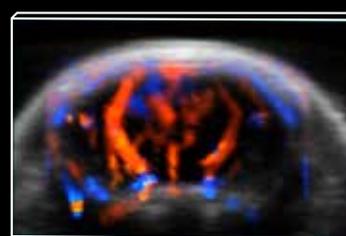
- Characterization of nanoparticles, dyes and other contrast agents
- Drug delivery and pharmacokinetic analysis
- Microdistribution of biomarkers
- Cell tracking



3D image of the mouse heart in diastole.

### Cardiology

- Cardiac function in 2D, 3D and 4D
- Hypoxia and ischemia measurement
- Hemodynamics
- Myocardial and vascular strain
- Cardiotoxicity



Coronal section of the mouse brain showing cerebral blood flow in a stroke model.

### Neurobiology

- Functional imaging with oxygen saturation, total hemoglobin and blood flow velocity
- Molecular imaging & cell tracking with dyes, nanoparticles or other agents
- Glioma research, Stroke assessment, Image-guided injection
- On-board neuroanatomical reference

NON-INVASIVE | REAL-TIME | LONGITUDINAL

# FUSION OF **ANATOMICAL,** **FUNCTIONAL AND MOLECULAR DATA**



Vevo<sup>®</sup> LAZR-X

## MX Transducers & Interchangeable Vevo Optical Fibers

The high-resolution MX linear array transducer technology can now be paired with high-efficiency fiber optics in a flexible way to optimize photoacoustic imaging for a specific application.



CUSTOMIZE **DEPTH, SENSITIVITY** AND  
**RESOLUTION** FOR YOUR RESEARCH

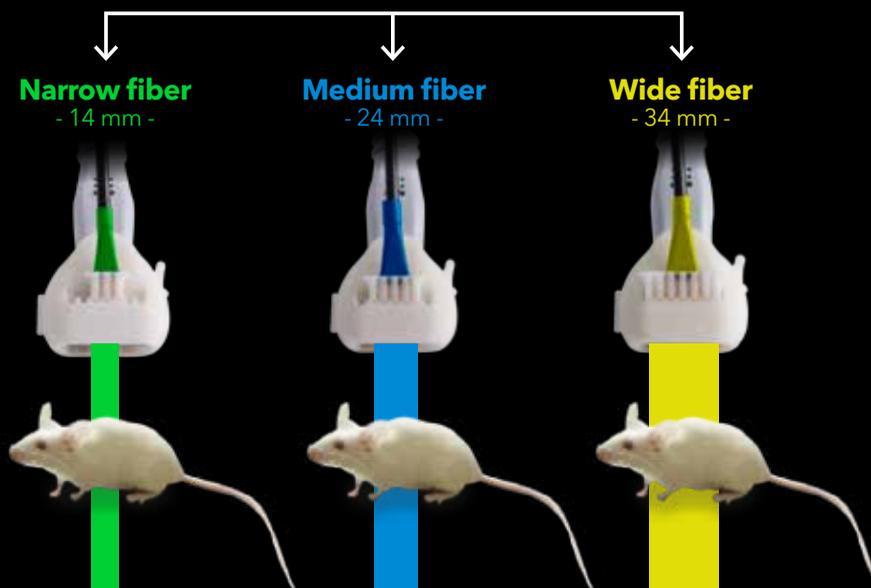
# CUSTOMIZE YOUR IMAGING NEEDS IN **TWO EASY STEPS**

## SELECT TRANSDUCER

Select an MX series transducer with Vevo Fiber Jacket suitable for the desired **animal**, **anatomy** and **resolution**.

## SELECT VEVO OPTICAL FIBER

Select a high-efficiency Vevo Optical Fiber (3 widths available) for the desired **width**, **depth** and **sensitivity** of photoacoustic imaging and insert into jacket to begin imaging.



## APPLICATION EXAMPLES

<b>MX201</b> 10-22 MHz Axial Resolution: 100 $\mu\text{m}$	Mouse brain, rat cardio	Rat deep abdominal, rabbit superficial tumor	Mouse whole body, pig skin, subcutaneous tissue
<b>MX250/250S</b> 15-30 MHz Axial Resolution: 75 $\mu\text{m}$	Mouse deep abdominal, orthotopic rat tumor	Rat abdominal, mouse abdominal	x
<b>MX400</b> 20-46 MHz Axial Resolution: 50 $\mu\text{m}$	Orthotopic mouse tumor, mouse cardio	x	x
<b>MX550D/550S</b> 25-55 MHz Axial Resolution: 40 $\mu\text{m}$	Subcutaneous tumor	x	x

# Vevo<sup>®</sup> LAZR-X

## Powerful Quantification Tools with Vevo<sup>®</sup> LAB Software

Post-processing and quantification of imaging data including:

- Percent oxygen saturation and total hemoglobin measurement
- Spectrally unmixed data for component analysis
- Onboard graphing capabilities for pharmacokinetic analysis and 3D distribution
- Contrast quantification software for relative blood volume, blood flow and perfusion parameters
- Myocardial and vascular strain analysis
- Onboard 3D and 4D rendering capabilities including segmentation and volume measurements

## Accessories

Vevo PHANTOM



- For characterization of photoacoustic contrast agents for multispectral imaging
- Spectral curves can be saved for in vivo spectral unmixing

Vevo Infusion Pump



- For automated in vivo bolus injection of drugs or contrast agents
- Quantification including graphing of time-intensity data

Vevo BRAIN



- Mouse stereotactic frame for reproducible animal positioning
- Includes high resolution ultrasound mouse brain anatomical atlas

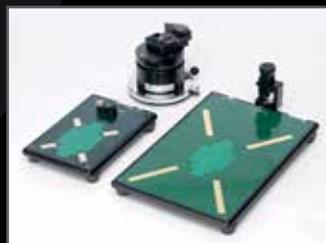
Vevo LAZRTight Enclosure\*



Vevo Imaging Station



Mouse & Rat Table

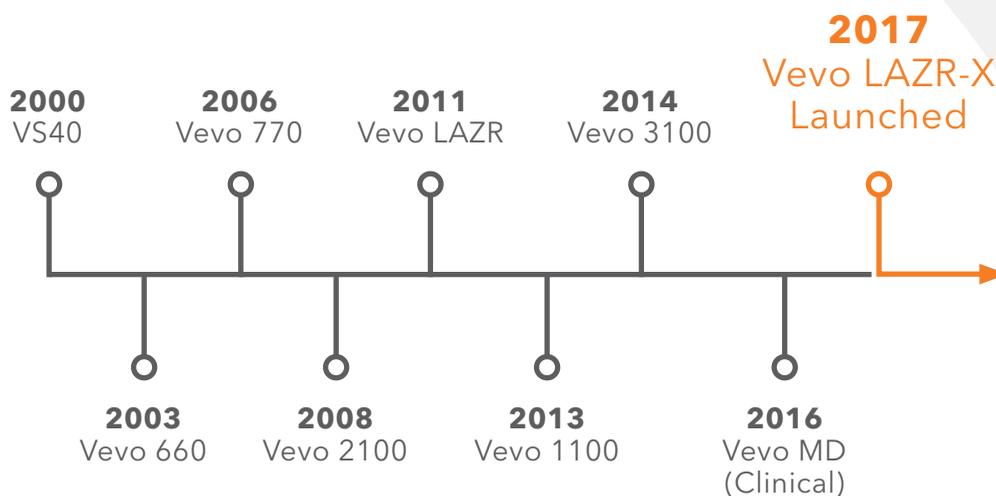


Anesthesia System



\* OPTIONAL: enclosure for operation without exposure to laser light. Ideal for imaging cores and multi-use labs.

“Through **bold innovation**, we empower those dedicated to the advancement of human health.” - FUJIFILM VisualSonics Purpose Statement



## Vevo Support

The Vevo LAZR-X Photoacoustic Imaging Platform is accompanied by support you can count on.

### Applications Support and Training

- Customer on-site training
- Customized hands-on education

### Technical Support

- On-site & online support
- Scientific applications expertise

### Online Resources

- Live and on-demand webinars
- Imaging guides and videos
- Grant support program
- Publication library
- Exclusive customer portal

For additional resources, support or service requests, visit our website [visualsonics.com](http://visualsonics.com)



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Seeing More Matters

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