

The Jefferson Small Animal Imaging Facility: High-Frequency Ultrasound Imaging Division

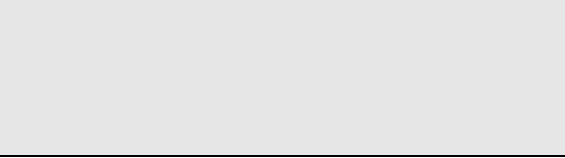
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Mission, Goals, Capabilities

The High-Frequency Ultrasound Imaging Division operates a Vevo 2100 high frequency, small animal, ultrasound imaging scanner (Visualsonics, Toronto, Ontario, Canada) with unique high frequency transducers (spanning frequencies from 24 to 70 MHz) in order to support many NIH-sponsored research projects within Thomas Jefferson University (TJU) and the Kimmel Cancer Center (KCC) as well as the Center for Translational Medicine (CTM). In particular the new instrument is equipped to provide 3D imaging, non-linear contrast imaging, color and tissue Doppler imaging as well as strain rate imaging modes that were not previously available to researchers at TJU and KCC. The Division also runs a Vevo LAZR system (Visualsonics), which provides photoacoustic imaging capabilities in conjunction with the Vevo 2100. Photoacoustic imaging provides high optical contrast co-registered with high-resolution ultrasound imaging in real-time (at depths up to 1 cm and axial resolution down to 45 μ m) using a 20 Hz tunable laser (680 - 970 nm). The Vevo 2100 represents a major upgrade for the small animal imaging capabilities of NIH-funded investigators at both TJU and KCC and has provided state-of-the-art, high resolution, real-time, live animal imaging in their research studies. Our current "critical mass" in the fields of cancer biology, cardiac biology and vascular pathology will continue to build upon their success with this advanced Vevo 2100 imaging system. Moreover, emerging studies at the Small

	<p>Animal Imaging Facility on neuroscience will also benefit from this unique and powerful piece of equipment. Additionally, the Vevo LAZR system is a new imaging modality for the entire region and will provide not only TJU and KCC investigators but also researchers throughout the city of Philadelphia and the surrounding area with access to a novel tool for small animal imaging in cancer and cardiac biology as well as vascular pathology. These three disease areas for which the Vevo 2100 system is best equipped with specific applications encompass the major strategic research initiatives of TJU and thus, are well aligned with the Institution's long-range biomedical research goals.</p>
<p><i>Major Equipment</i></p>	<ul style="list-style-type: none"> • Vevo 2100 high-frequency ultrasound scanner • Vevo LAZR photoacoustic system • MS250: 24 MHz MicroScan transducer • MS400: 38 MHz MicroScan transducer • MS550D: 55 MHz MicroScan transducer • MS700: 70 MHz MicroScan transducer • LZ-250: 25 MHz photoacoustic probe • Small animal physiological monitoring and containment center
<p><i>Services</i></p>	<ul style="list-style-type: none"> • High frequency (24-70 MHz) ultrasound imaging • 3D imaging • M-mode imaging • Pulsed Doppler • Color and power Doppler imaging • Tissue Doppler imaging • Non-linear ultrasound contrast imaging • Strain rate imaging • Contrast quantification analysis • High frequency (25 MHz) photoacoustic imaging • Oxygenation-hemoglobin analysis • Photoacoustic signal quantification analysis

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- Animal handling and tail vein injections
 - Radio frequency (RF) data analysis
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