

Mouse UltraSound Imaging Core (MUSIC) Introductory User Information



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I. Overview

A. Core History: The Vevo 770 Imaging System (VisualSonics, Toronto, Canada) was acquired in 2007 via an NIH Shared Instrumentation Grant and upgraded to the Vevo 2100 in 2011 by a collaborative investment between Yale Cardiology and Vascular Biology and Therapeutics program. The purpose of bringing this unique instrument to Yale University School of Medicine was to strengthen our already well-developed core of expertise in non-invasive imaging, specifically, in small animals. Though the primary users group consists mainly of experts in cardiovascular biology, the potential uses of the equipment are broad and include imaging of multiple organ systems including assessment of bloodflow in a variety of vascular distributions. Additional uses of the equipment (e.g. image-guided microinjection) are possible with purchase of accessories that were not part of the original SIG, but could be added if adequate need and funding were demonstrated. This equipment is available for use throughout the Yale community and it is our hope that it will enhance the quality of multiple research efforts at our institution.

To ensure that this equipment is optimally utilized, we have established an administrative group and, together, we have crafted the following organizational and management plan. Herein, we have outlined this information for new users. The plan is not a static one, and we are open to input that will help improve the use of this unique piece of our small animal imaging core (<http://medicine.yale.edu/intmed/cardio/ytric/index.aspx> and <http://medicine.yale.edu/intmed/cardio/yvrc/resources/index.aspx>). Comments and suggestions are welcome.

B. Specs for Vevo 2100

We currently have the following probes and software: Vevo 2100 imaging station, MS250 and 550D probes, software for 2D, Doppler, Color Doppler, contrast and strain imaging. Additional equipment available for this setup and details regarding potential applications can be viewed at the company website: <http://www.visualsonics.com>

C. Core Services

Consultation regarding imaging needs can be performed by setting up an appointment with Dr. Young, Dr. Sinusas, or Nikki Mikush. Imaging is performed by Nikki Mikush, an RSDS-certified clinical cardiac sonographer specially trained in mouse imaging on the Vevo2100. Data analysis is performed by Nikki Mikush and data is sent to PI as Excel spreadsheets, TIFF or AVI files, as needed.

II. Location, Scheduling and Fees

A. Locations

- i. Primary Location: The machine is located primarily in LSOG 128. Animals can be transferred to this location from other animal care

facilities either by arranging transfer with YARC or by transport in covered containers by PI lab personnel (after YARC approval, please see their policy a <http://iacuc.yale.edu/policy/4442-transportation-animals-inter>) with a few exceptions as follow.

- ii. TAC and other special situations: Animals cannot leave and return to TAC. Therefore, we have arranged a portable anesthesia unit that can be scheduled to perform imaging inside TAC, or in case of rare other situations where imaging cannot be done in LSOG 128. The PI's group must provide access to one of the YARC shared procedure rooms which is approved for use by their animals.

B. Scheduling: New users should contact Lawrence Young Lawrence.young@yale.edu, Al Sinusas albert.sinusas@yale.edu, or Nikki Mikush (nicole.mikush@yale.edu) to discuss specific imaging needs. Scheduling is then done by Nikki Mikush using a shared Google calendar which can be viewed for experimental planning purposes by all users.

C. Fees

- i. In order to help cover technical, administrative, supply and maintenance service contract fees (of which the service contract alone is \$20,115/year), the following fee structure has been created. All users are billed \$140/hour for imaging and data analysis. The level of data analysis performed by the core vs. PI lab personnel is negotiable.

All users are expected to provide PTAE0 numbers at the time of application for use of the equipment to facilitate the administrative process. Questions regarding charging information should be directed to Nikki Mikush. Every effort to fairly distribute charges that will allow the optimal use and operation of the facility will be made. Alternative ideas and questions regarding operating cost structures may be submitted to the advisory board for discussion.

III. IACUC Protocol Instructions

Prior to the first imaging session, the PI should submit a protocol addendum to their own IACUC protocol that covers use of any animals that will be subjects for ultrasound imaging. This can usually be done on a rolling basis and generally takes ≤ 2 weeks. In addition, the core personnel (Nikki Mikush) should be added to this same protocol. A pre-set IACUC protocol for the imaging session, including anesthetic use, etc. is available from the core facility for use as a template by PIs (can be requested from Nikki Mikush at time of initial setup). Personnel forms for Ms. Mikush are also available for submission from the core. These can be sent to PI's at the time of initial discussion of the PI's imaging needs.