

DLAR Imaging Core (DLARIC)

DLARIC located at 6th Floor of A. James Clark Hall offers state-of-the-art bioimaging equipment and irradiation services to researchers at the University of Maryland, College Park. The core is located inside the DLAR vivarium that contains rodent housing, large animal housing, procedure rooms, a dedicated surgery suite, cage wash support areas, and quarantine housing.

Imaging core has dedicated anesthesia systems for all imaging modalities, if needed. Animal prep room with biosafety cabinet is available to handle rodents as needed.

IVIS Spectrum

DLAR Imaging Core houses the IVIS® Spectrum advanced preclinical optical imaging system that enables non-invasive monitoring of cell trafficking, tumor growth and gene expression.

Image capture

Back thinned, back illuminated grade 1 CCD Camera and Lens provides high quantum efficiency scanning over the entire visible to near-infrared spectrum. The system features 10 narrow band excitation filters: 415 nm – 760 nm and 18 narrow band emission filters: 490 nm – 850 nm. Lens provides high resolution - down to 20 microns at FOV of 4 cm.

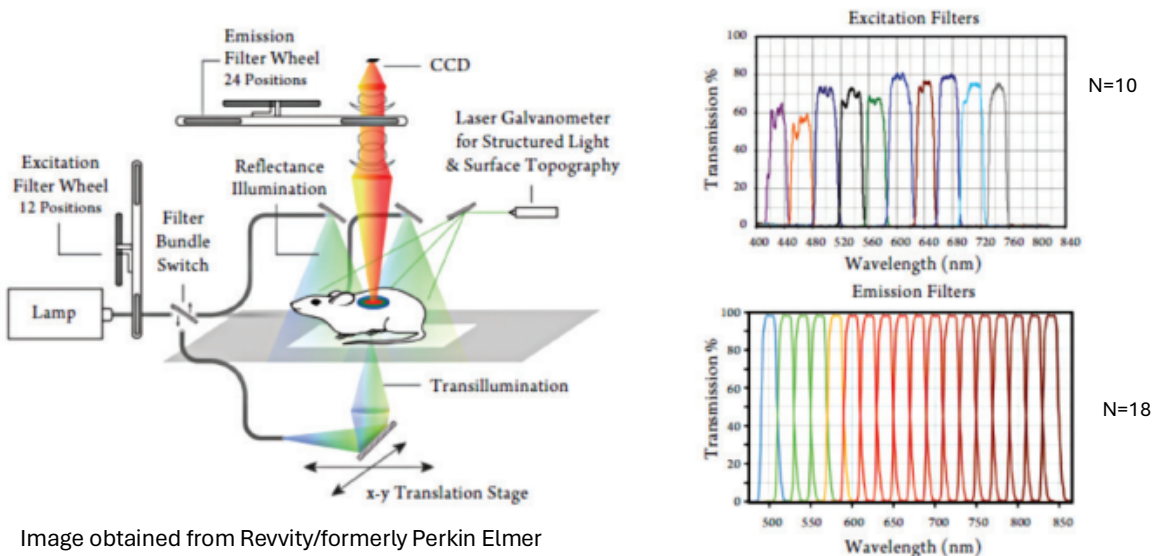


Image obtained from Revvity/formerly Perkin Elmer



Single Cells In Vitro (20 microns)

From 20 microns to localize single cells to five whole mice, the IVIS Spectrum gives you the automated flexibility, throughput and resolution required to quantitate functional developments in whole animals down to a single cell. Image obtained from Revvity/formerly Perkin Elmer

Bioluminescence imaging- best in class in vivo sensitivity

Image multiple bioluminescent reporters like firefly luciferase, Renilla luciferase and bacterial luciferase *in vivo* at depth rapidly and quantitatively. The ultra-sensitive camera optics allows the detection of as few as five cells. [Revvity](#) offers Luciferin Luciferase Cell Lines Lentivirus Particles.

Fluorescence imaging – versatility in fluorescence

The IVIS Spectrum can image and quantify all commonly used fluorophores, including fluorescent proteins, dyes and conjugates. [Revvity](#) offers the broadest portfolio of fluorescent agents and dyes for *in vivo* applications. The IVIS Spectrum is the most sensitive system to visualize these fluorescent agents in various in vivo applications.

Multispectral Imaging with Advanced Spectral Unmixing Algorithms

Advanced spectral-unmixing algorithms and a broad range of high spectral resolution filter sets minimize autofluorescence and provide the opportunity to image a wide variety of targeted and activatable fluorescent probes and reporters.

Absolute localization in optical imaging – 3D analysis

3D diffuse tomography utilizes structured light data with bioluminescence or fluorescence images to reconstruct three dimensional representations of light emitting reporters and compute signal strength.

Determine geometry and quantify the depth and intensity and of fluorescent sources in 3D space using FLIT (Fluorescent Imaging Tomography) or bioluminescent sources using DLIT (Diffused Luminescent Imaging Tomography).

XIC-3 Animal Isolation Chamber Kit

The chamber is available at DLAR, provides biological isolation of anesthetized mice or small rats before they are imaged in an in vivo imaging system.



Living Image (LI) Acquisition/Analysis Package software allows for advanced quantification and analysis of data. LI SW can be downloaded to your machine for no additional cost.

Vevo 3100 Ultrasound

Vevo 3100 Imaging System along the Vevo® Integrated Rail System and peripheral equipment for ultrasound imaging of rodents. The Vevo 3100 micro-ultrasound imaging system combines ultra high-frequency ultrasound imaging operating up to 70 MHz and imaging up to 300 frames per second.

The system is equipped with complete animal setup and handling to achieve noninvasive in vivo imaging under accurate physiological conditions (temperature-controlled heated stage, gas anesthesia, with EKG, temperature, and respiratory rate monitoring). The system has an injection setup mounted on dedicated rail-system extensions to enable Y-axis stage adjustment that can be used to assist in image-guided injections.

DLAR imaging core three transducers are available to work with Vevo 3100 micro-ultrasound system:

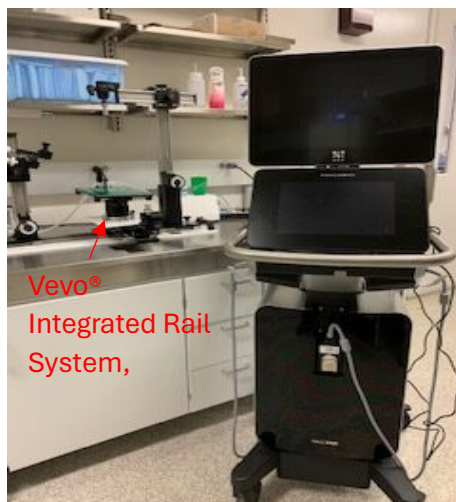
- MX201 (axial resolution-100 μm ; FOV- up to 23 mm width; scan depth- 36 mm and band width-10-22 MHz), can be used for all contrast applications, Rabbit cardiovascular, Rat cardiology and abdominal (> 400g).
- MX250 (axial resolution-75 μm ; FOV- up to 23 mm width; scan depth- 30 mm and band width-15-30 MHz), can be used for all contrast applications, Rat cardiology and abdominal (<400) and
- MX550D (axial resolution- 40 μm ; FOV- up to 14 mm width; scan depth- 15 mm and band width-25-55 MHz) can be used for mouse abdominal, Mouse reproductive, Mouse vascular, Mouse & rat embryology, Small rat vascular, Tumor imaging (<14mm diameter).

The animal handling and physiological monitoring platforms (a mouse and a rat platforms)

Enables to position the animal, to monitor physiological parameters.

Vevo® Integrated Rail System

Position the transducer scan head system to set the image plane and undertake the imaging session.



Vevo 3100 Ultrasound with Mouse animal handling and physiological monitoring platform



Mouse animal handling and physiological monitoring platform and physiological Controller

FVMPE-RS Multiphoton Laser Scanning Microscope

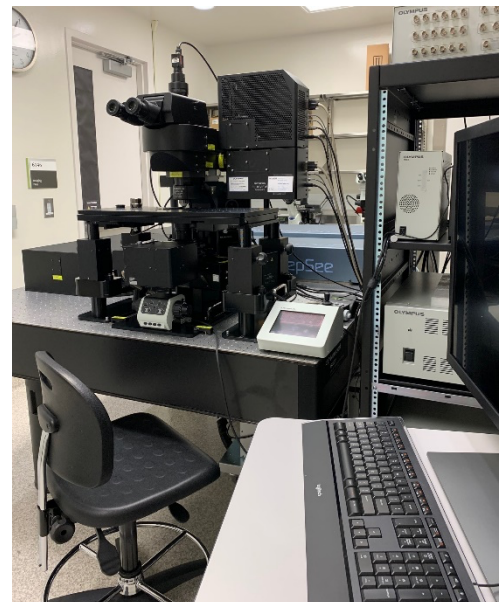
The FVMPE-RS multiphoton microscope employs advanced technology and optical design to enhance sensitivity and resolution during deep imaging of biological specimens.

- The FVMPE-RS imaging platform supports a dual wavelength infrared pulsed laser or two independent tunable infrared lasers for multichannel, multiphoton excitation imaging. DLARIC has two laser sources that provide excitation wavelengths in the range of 690 nm to 1300 nm.
- broad 400 nm to 1600 nm spectral transmission window efficiently delivers near-infrared excitation without compromising short wavelength detection
- Large-area detection path collects more emission signal, especially large-angle scattered photons
- TruResolution objectives offer automated spherical aberration compensation to increase brightness and resolution, revealing fine details at every plane within a deep image stack

High-Speed resonant (438 fps maximum imaging speed) scanner is available for you to capture rapid, dynamic phenomena, such cell transport during blood flow and calcium signaling events in neurons and other cells.

The dedicated high NA condenser detects transmitted fluorescence as well as transmitted second harmonic generation (SHG) signals

The FVMPE-RS Multiphoton Laser Scanning Microscope imaging at DLARIC is assisted use service. All microscope users are required to take laser safety training with ESSR.



X-RAD Biological Irradiator

The X-Rad 320 is a self-contained x-ray system designed to deliver a precise radiation dosage to biological samples including cell lines and rodents. The maximum output is 320kV with a maximum current of 30mA.

- Defined dose of x-rays can be delivered to biological samples.
- The chamber contains an adjustable multi-position shelf with rotating platform to provide uniform radiation administration.



- Beam hardening filters are available to ensure low energy photons are filtered out delivering only desired photons to the specimen.
- DLARIC accommodates irradiation of immunodeficient mouse models.
- Authorized DLARIC staff will perform all the irradiation of all biological samples.

Albira Si PET/SPECT/CT imaging system

The Albira Si is a trimodal imaging system that integrates Positron Emission Tomography (PET), Single-Photon Emission Computed Tomography (SPECT), and X-ray Computed Tomography (CT) within one fully x-ray shielded and stand-alone imaging platform. The fully automated animal handling system enables automatic co-registration of images.

DLAR is in the process of getting the equipment online and available for imaging studies.



Additional Imaging Study Support Equipment

OEC One Mobile C-arm Fluoroscopic X-ray System

The OEC One Mobile C-arm system uses X-rays to provide fluoroscopic and digital spot/film images of the subject anatomy, surgical tools/devices, and/or contrast agents.

The maximum field of view is 9 inches and maximal output is 110kVp/20mA



Contact: DLARIC Email: dlaric@umd.edu

Links:

The Imaging Core URL: [DLAR Imaging Core \(DLARIC\)](#)

For scheduling Training and Services: [DLAR Imaging Core](#)