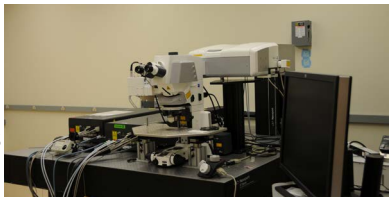
CONFOCAL MICROSCOPY CORE FACILITY
DEPARTMENT OF PHYSIOLOGY
CIBR: Center for Innovative Biomedical Resources

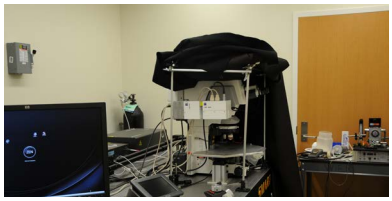
CORE INSTRUMENTATION

Zeiss 710 NLO & Zeiss 7MP

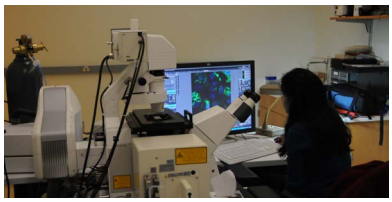


- Upright confocal microscope with single photon and multiphoton excitation capabilities for imaging live cells, slices and whole animals
- Excitation wavelengths 730 to 1300 nm; 2 PMT and 2 sensitive GaAsP detectors
- Can be combined with electrophysiology or other measures

Zeiss 5Live & Zeiss 510



- Point-scanning and slit-scanning confocal microscope
- Fast acquisition frame rates for studying dynamic cellular processes at physiological temperatures
- Dual scan heads (5Live) allow simultaneous imaging and optical manipulation
- Excitation (488, 543, 560, 633, Ti:Sapphire laser)



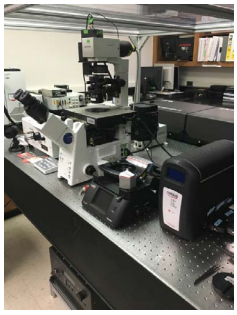
Olympus LCV Incubated Microscope

- Widefield inverted microscope allowing continuous imaging of cells for hours or days
- Fluorescence and DIC imaging on multiple positions
- Cell migration, cell division, wounding and repair processes, phagocytosis

Olympus FV300/Atomic Force Microscope

- Inverted confocal microscope capable of multicolored imaging
- Equipped with an Atomic Force Microscope accessory (AFM, Bruker)

The new microscope combines the capabilities of confocal imaging with atomic force microscopy for your experiments.



MISSION

The Confocal Core's mission is to provide researchers with a wide array of state-of-the-art confocal imaging equipment to enable acquisition of high resolution images (both *in vivo* and *in vitro*). The Confocal Core offers training and assistance in the use of multiple confocal microscopes housed in our facility. Optimization of data acquisition and image processing are both part of the training, thus enabling researchers to efficiently design studies, acquire image data and extract relevant data features. The confocal facility is available to all UMB researchers and extramural users on a fee-for-service basis.

CORE SERVICES

The facility provides individual instruction on an array of confocal microscopes. The needs of the researcher are considered in choosing which microscope will best suit the experimental design. Facility users can be trained to utilize the machine best matching their respective imaging requirements. In general, imaging of fixed samples, cultured cells, organ slices and small animals can be accommodated. Imaging techniques including FRET, FRAP, photoactivation and uncaging are readily implemented. The microscopes have excitation sources that cover most fluorophores with excitation ranging from 355-633 nm. Multiphoton excitation of fluorophores is also available on select instruments. An image analysis workstation equipped with software packages is available to users.

The Core also has a culture room with an incubator, culture hood and a widefield fluorescence microscope for use in preparation of cultured and live samples. Preparation of live animals for imaging experiments can also be done in this newly renovated space.

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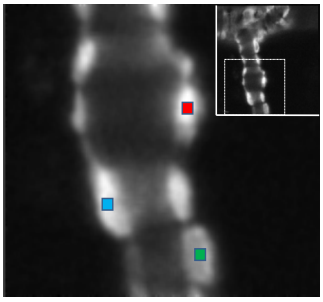
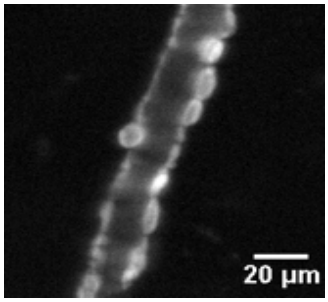
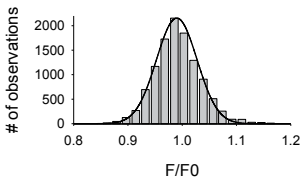
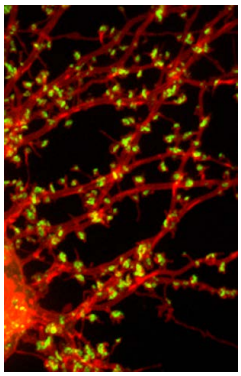


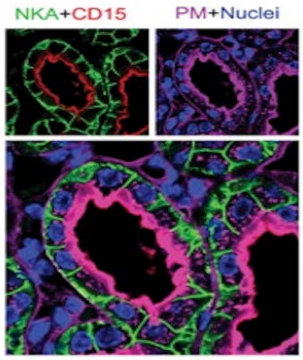




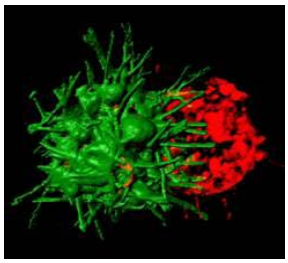
Imaging of vascular tone and Ca^{2+} signaling in murine cremaster muscle arterioles *in vivo*
Mauban *et al.* (2013) Microcirculation



Cultured neuron expressing tdTomato (red) and the synaptic marker PSD-95-GFP (green)
courtesy of Blanpied Lab



Fixed Kidney Sections
courtesy of Dr. A. Villar



Microtentacles on a live, free-floating breast tumor cell labeled with membrane-localized GFP (green) encircle a neighboring tumor cell (red)
courtesy of Martin Lab

CONTACT

Thomas Blanpied, PhD, Director
Department of Physiology
Room 505, Howard Hall
tblanpied@som.umaryland.edu
410-706-4769

Joseph Ryan H. Mauban, PhD
Confocal Core Manager
Department of Physiology
Room 523, Howard Hall
jmauban@umaryland.edu
410-706-3925

LOCATION

Room 610, Health Sciences Facility I
685 West Baltimore Street
Baltimore, MD 21201
410-706-3925

Web Address
http://medschool.umaryland.edu/confocal