

SUNY Upstate Medical University

Confocal & 2-photon Core Facility

Syracuse, New York



Confocal & 2-photon Core Facility

- The SUNY Upstate Medical University established the Confocal and 2-photon Core Facility in 2005 as a service for research investigators.

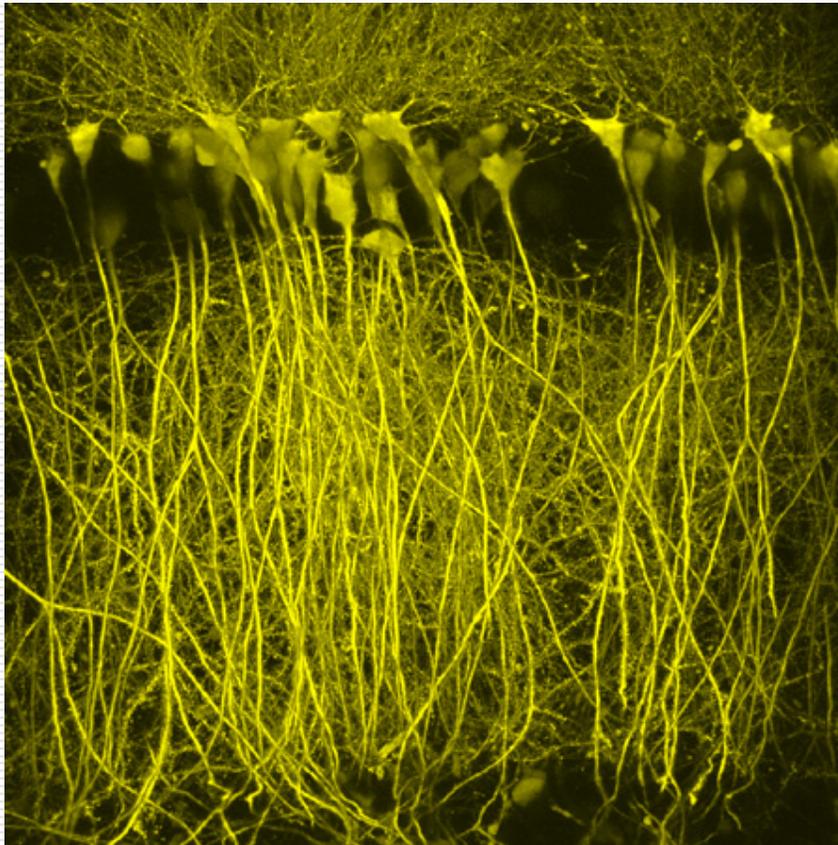
 - This facility provides neuroscientists with tools to visualize and study the 3D structure and process dynamics in the living/fixed cell/organism and has potential applications in many research areas:
 - Neuroscience
 - Ophthalmology
 - Microbiology
 - Molecular biology
 - Pharmacology
 - Cancer research
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Confocal & 2-photon Core Facility Equipment

- Zeiss LSM 510 META NLO microscope system consists of two microscopes (inverted and upright) that share a portable scanhead with multiphoton excitation imaging and spectral detector capabilities as well as four lasers: multiline Ar, 543 and 633 nm HeNe, and tunable 720-950nm femtosecond. Three independent simultaneous confocal channels for reflection and fluorescence are available as well as fourth channel for transmission (DIC) imaging. Wide variety of objectives, digital zoom, and motorized stage allow imaging broad range of specimens: from individual cell to 10 cm piece of tissue. Environmental chamber allows to image living cells.
 - 3D image reconstruction and multiple time series are also available. The Zeiss software along with image saves whole experiment configuration thus simplifying automating long or repetitive experiments.
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Imaging Example #1

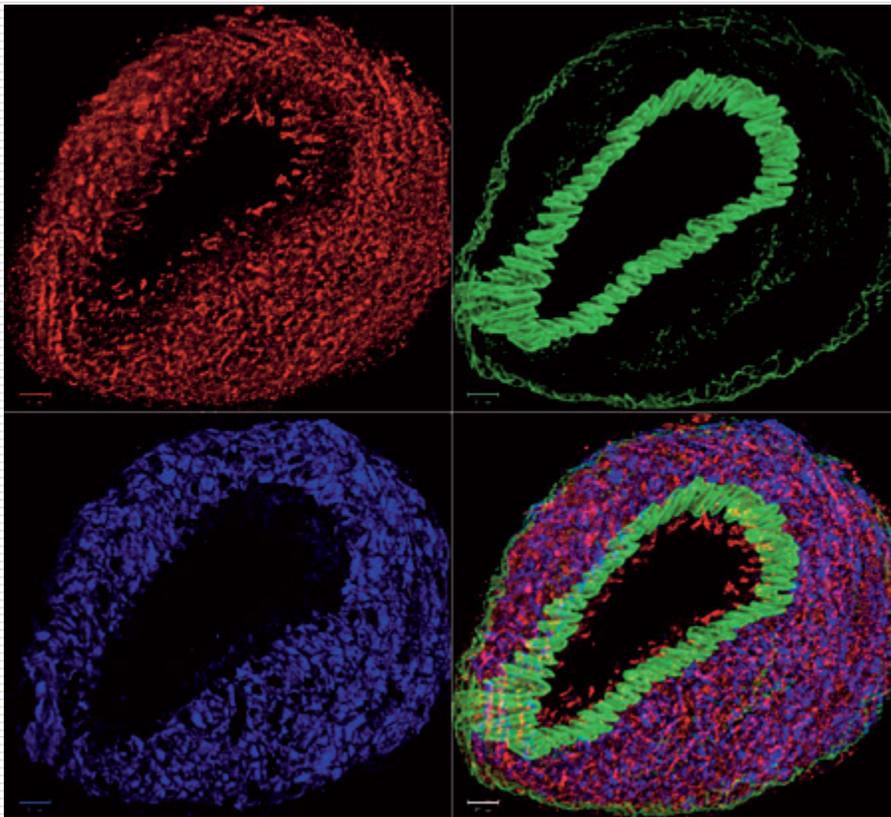
Hippocampus Pyramidal neurons



The specimen is a 300 μm thick living brain slice prepared from a mouse stably expressing YFP in a subset of neurons (YFP-H line; Jackson Laboratories). A frame in the hippocampus containing a subset of CA1 pyramidal neurons was imaged. A z-stack over a range of nearly 80 μm . The image impressively depicts the huge number of dendritic spines existing on CA1 pyramidal cells. Width 325, height 325 μm .

Imaging Example #2

Endothelin B (ETB) Receptor staining

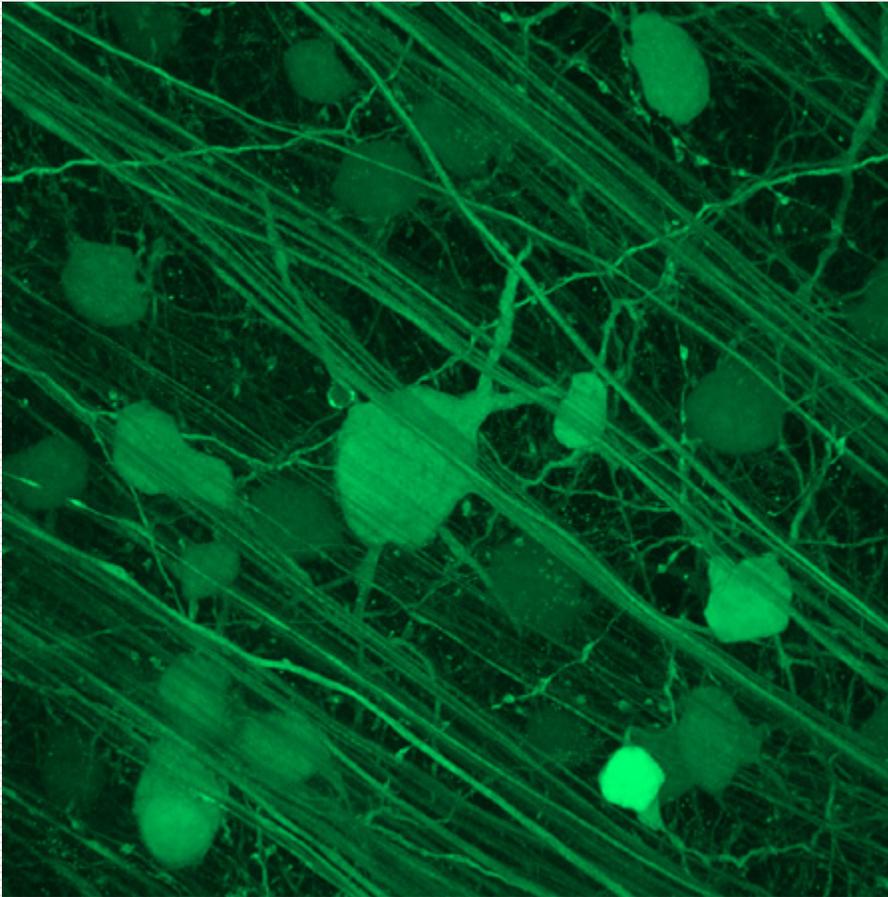


ETb(red), smooth muscle alpha-actin (SMA,blue) and elastic fibers (green) staining in a resistance artery of a rat lung.

Autofluorescence of the elastic fibers was collected between 505-530nm with a 488nm Argon excitation. Width 142.5, height 129.6 μm

Imaging Example #3

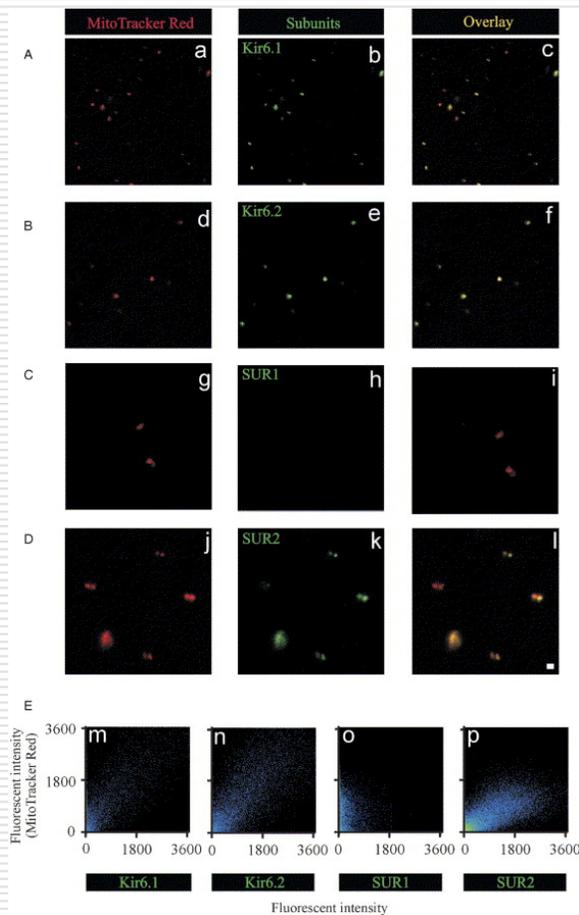
GFP expressing retinal ganglion cells



Recombinant adeno-associate virus was used to infect rat retinal ganglion cells by intravitreal injection. A wholemount was prepared after perfusion fixation and the sample imaged. Width 0.14, height 0.14 mm .

Imaging Example #4

Investigating subunit composition of ATP-sensitive potassium channels



Fluorescence-based immunoassay of mitoKATP channel subunit composition. Mitochondria labeled with Alexa Fluor 488 secondary antibody were brightly fluorescent in the samples that were incubated with anti-Kir6.1 (A), anti-Kir6.2 (B), and anti-SUR2 (D) antibodies. By contrast, no fluorescent signal was detected in samples that were incubated with anti-SUR1 antibody (C). Scale bars = 2 μm.

Hours and cost

- ❑ Our facility is open Monday through Friday, 9:00 am to 5:00 pm for your convenience.
 - ❑ Unsupervised usage is allowed on nights and weekends for certified users.
 - ❑ Project consultation, training, and technical assistance are available from Core Director (a Zeiss certified microscopy specialist).
 - ❑ Usage fee is \$33-\$40/hr. Please contact our Core Facility for current rates for in-house SUNY Upstate Medical University customers and for outside customers.
 - ❑ For additional information visit our website or contact Dr. Matiukas.
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<http://www.upstate.edu/researchadmin/facilities/confocal.php>
