

NRI-MCDB Microscopy Facility General Statement

The Neuroscience Research Institute (NRI) and the Department of Molecular, Cellular and Developmental Biology (MCDB) jointly operate a shared core microscopy facility. Dr. Benjamin Lopez, a highly accomplished researcher with extensive expertise in microscopy, serves as the full-time Director of the Facility. Our instrumentation includes four high-end imaging instruments: (1) a Leica SP8 resonant scanning confocal with live-imaging chamber, white light laser, fluorescence lifetime imaging, and integrated deconvolution processing, (2) an Abberior Instruments Facility Line STED super-resolution microscope capable of 30-50 nm resolution of live and fixed samples with 5 excitation laser lines, 2 STED depletion lasers, a special MATRIX detector, and adaptive optics, (3) a Zeiss Z.1 Lightsheet microscope with 6 laser lines and dual sCMOS camera system, and (4) a JEOL transmission electron microscope.

Additionally, there are 4 research grade compound microscopes equipped with fluorescence, phase, DIC, darkfield, and bright field capabilities. All compound microscopes are equipped with monochrome or color cameras. A novel instrument, the Nanolive 3D Cell Explorer, offers label-free low photodamage imaging for long-term timelapse imaging.

There are three sample sectioning instruments: (1) a cryostat for sectioning frozen samples at 5-50 μm thickness, (2) a vibratome for sectioning tissues at 50 μm to 1 mm thickness, and (3) an ultratome for sectioning of resin embedded samples at 80 nm to 2 μm thickness. For data storage there is a 40 TB data server with 10Gbit connections to the campus network and for data analysis there are two high-end computer workstations for 3D image processing and analysis using IMARIS and other software applications.