Located on the 5th floor in the Life Science Laboratories the Light Microscopy facility provides powerful resources for imaging model organisms, tissue, cells, biomaterials, and artificial structures and houses state-of-the-art equipment including almost every light microscopy imaging modality currently available. Cell culture facilities are also available as well as other routine needs for biological imaging. This facility is one of a few designated Nikon Centers of Excellence providing a unique opportunity for training, demonstration, instrument development, and research.

The facility accepts samples and will perform requested analysis. We offer training to users to conduct experimentation for use on a fee for service basis to both internal and external researchers, academic or industry based. Following an initial consultation, covering experimental parameters training and access is arranged through the director.

**ACCESS**

To request access, training, or additional information please contact James Chambers at jjchambe@umass.edu or (413) 577-4580. Our rates are competitive and tiered based on needs and usage. Visit our website at umass.edu/ials/light-microscopy for current listing.

**TRAINING**

Training for new users consists of:

- lab safety training,
- operation of the instrument and associated software,
- use of data analysis software,
- exporting or presenting data,
- clean up and shutdown of the instrumentation.

Once the training is complete, researchers may schedule their experiments through the director of Light Microscopy (James Chambers) or online through FOM (Facilities Online Manager) at fom.umass.edu/fom.

**PARTNER WITH US!**

UMass Amherst | Core Facilities
Institute for Applied Life Sciences
University of Massachusetts Amherst
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**Research and Innovation to Translate Basic Science into Product Candidates**

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[umass.edu/ials/core-facilities](umass.edu/ials/core-facilities)
EQUIPMENT

A1R: Nikon A1 Resonant Scanning Confocal with TIRF Module
This microscope is highly versatile and can be used for live or fixed samples. The resonant scanner allows for very fast acquisitions and the GaAsP detectors are extremely sensitive. This microscope has 6 lasers and the full gamut of objectives and software modules.

SD: Nikon with Yokogawa Spinning Disk Confocal and Orthogonal Stimulation
This microscope is great for live cells as it is a low-light technique. With four laser lines and an additional mini-scanner for PA/FRAP/etc., we can easily image dynamic movements in live cells, stimulating/bleaching in real time.

A1SP: Nikon A1 Spectral Detector Confocal with FLIM Module
This microscope is great for fixed samples and is especially useful when experimenters may have overlapping emissions from fluorophores or auto-fluorescence. The 32-channel spectral detector can be implemented with the click of a button and allows for 32 x 2.5 - 10 nm bins of fluorescence identification.

A1R-SIMe: Nikon A1 Resonant Scanning Confocal with Structured Illumination Super-Resolution
This microscope is very versatile and can be used for live or fixed samples. The resonant scanner allows for very fast acquisitions and the GaAsP detectors are extremely sensitive. The SIM side of the microscope is extremely easy to use with no special sample preparation required for super-resolution imaging.

A1MP: Nikon A1 Resonant Scanning Multi-Photon Confocal
This microscope is an upright, manual microscope that is suited for in vivo, intra vital imaging as well as imaging in and through thick tissues and samples. It uses a tunable infrared pulsed laser to excite fluorophores at the focal volume and features a resonance scanner that can image very quickly along with a fast moving piezo nose piece. We also have visible lasers for standard upright confocal microscopy.

HCA: Nikon with High Content Analysis
This microscope is truly amazing for its ability to collect and automatically analyze data from live or fixed samples. The intuitive and adaptive software can be programmed to count cells, monitor growth, take high-resolution pictures when a certain feature is found, scan slides, scan multi-well plates, etc. A robot can even load your multi-well plates. It has two imaging paths; wide-field and spinning disk. When it is done, you can have the microscope send you a text message that contains any key variables that you need to know right away.

A1R-STORM: Nikon A1 Resonant Scanning Confocal with STORM Module
This microscope makes doing 3D STORM imaging straightforward. This has STORM-4.0 which includes a cylindrical lens to provide z-information on your molecules of interest. This also has the option to change not only the TiRF angle with the click of a button, but also the direction of the laser entering the back aperture of the objective.

LCMD: Nikon with Arcturus Laser Capture Micro-Dissection
This microscope is really a cellular robot. You can find cells or regions using bright field or fluorescence that you are interested on tissue slices and draw a line around them, cut them out, move them to a cap and then process the cap for downstream experiments (sequencing, proteomics, etc.).

Industry Sponsorship
The benefits of working with Nikon as an industry collaborator are that UMass Light Microscopy Facility users receive formal and informal training from Nikon engineers, frequent on-site technical support, access to new hardware and software technology, and assistance with cutting-edge experimental set ups.

TESTIMONIAL
“I have only been using the SIM and STORM microscopes at the UMass light microscopy facility for a few months and already it seems like my data has the potential to transform my thesis project. Thanks to the guidance and help from the facility manager (Jim) I have been collecting images that have changed my approach completely and might lead to some pretty exciting findings in my field. The facility manager has been more than patient while training me, has provided valuable advice and makes the facility a pleasant and productive environment, constantly striving to improve it. I am excited to continue to work and collect data that can impress any audience, and of course push my field forward!”
– Emily Melzer

Massachusetts Life Sciences Center
A significant portion of core equipment has been purchased through MLSC grant funding support.