Bio-Imaging Facility Reopening

The facility has reopened. Below are post COVID rules.

Post COVID 19 Rules

- Reserving equipment at [http://bookit.hunter.cuny.edu](http://bookit.hunter.cuny.edu) prior to use is mandatory
- There is a 15 min buffer between bookings for any instrument
- Only one person at a time can use any instrument
- Masks must be used in the facility at all times
- Keep a 6ft distance from others while in the facility
- All users must complete the Hunter COVID screening checklist. [http://hunter.cuny.edu/covidscreening](http://hunter.cuny.edu/covidscreening) prior to coming to the facility
- Users must wipe down the equipment with an ethanol cleaning solution after each use. Ethanol spray bottle and paper towels are available in the facility

Several instruments are too close to be booked at the same time
The machines listed below should not be reserved at the same time. To check bookings use the resource calendar on the booking website

- Imaris 8.41 Imaging Station and the Imaris 9.12 Imaging Station
- Seahorse, Odyssey and BioTek PowerWave Microplate Reader
- GloMax®-96 Microplate Luminometer, Typhoon 9410 and Autoquant Deconvolution Station

When using the systems listed below please use the curtains that separate the instruments

- Nikon Eclipse Ti Mosaic System
- Nikon Eclipse TE 200 Calcium Ratio
- Leica TCS Confocal
- Perkin Elmer Spinning Disk Confocal
Description of the Facility

Background Overview

The BioImaging Facility at Hunter College is centered in a multi-room facility of 1024 sq. ft. located in the Biological Sciences Department on the 8th Floor of Hunter North building. A satellite facility also includes a number of instruments on the 4th Floor of the Belfer Research building (at 69th Street and York Ave). Faculty and students have access to a broad spectrum of instruments, ranging from simple white light wide-field microscopes to fluorescent multidimensional super-resolution and confocal imaging systems. The Faculty supervisor and Scientific Director is Dr. Diana P. Bratu. Dr. Lloyd Williams is the Managing Director of the facility. The facility staff has expertise in many areas of microscopy including the laser scanning confocal microscopy, super-resolution microscopy, two-photon microscopy. They are also familiar with many image analysis software packages, including, Imaris, Volocity, Autoquant, MetaMorph, and NIS-Elements. Detailed descriptions of the equipment in the facility is given below. All equipment is located at Rm 826 HN or at the 4th floor of the Belfer Research Building where designated.

To book time on any of the instruments go to

http://bookit.hunter.cuny.edu
Nikon Eclipse Ti, TIRF/SIM

The Nikon TIRF SIM microscope allows the users to do both Total Internal Reflection Microscopy and SIM super-resolution microscopy. The acquisition software is Nikon NIS-Elements.

The charge for this instrument is $20/hr.

Belfer Nikon A1 Confocal Microscope

The Nikon A1 Confocal microscope is Nikon's powerful fully-automated confocal imaging system, capable of capturing... enhanced sensitivity. The acquisition software is NIS-Elements. The system is located at Belfer Research Building.

The charge for this instrument is $20/hr.

Nikon Eclipse Ti Mosaic System

The Nikon Eclipse Ti scope is a wide-field fluorescent microscope. It is equipped with Andor iXon EMCCD camera and a DG5... Optogenetics, Opto physiology, photobleaching/activation and uncaging applications.

The charge for this instrument is $15/hr.
Perkin Elmer UltraView ERS
The UltraView is a spinning disk confocal microscope equipped with five laser lines, which allow visualization of GFP, mCherry, and other fluorophores. It is used for high-speed, multiple-probe, time-lapse experiments; NIS-Elements software is used for image acquisition and analysis.

Leica Confocal TCS SP8 DLS
The Leica TCS SP8 DLS is a dual function fluorescence microscope that can be used as a conventional laser scanning confocal microscope (LSCM) or as a lightsheet fluorescence microscope (LSFM). The charge for this instrument is $20/hr.

Leica Confocal Microscope TCS SP2
The TCS SP2 Laser Scanning Spectral Confocal Microscope can do measurements of transmitted light, fluorescence, and laser scanning fluorescence imaging. The charge for this instrument is $20/hr.
The calcium ratio imaging system consists of: a Nikon Eclipse TE 200 inverted epifluorescence microscope, Sutter Lambda 10-3 micromanipulator and software, and Nikon DigiSight digital camera imaging software with Calcium & FRET plug-in. The system also is equipped with a Narishige micromanipulator system.

The charge for this instrument is $10/hr.

The Nikon Ti-S microscope has a SOLA Light Engine solid state light source and a Nikon DigiSight digital camera with filter sets for DAPI FITC and RFP. The charge for this instrument is $5/hr.

JEOL JEM-100C/CX Transmission Electron Microscope

The JEOL JEM-100C/CX transmission electron microscope is an advanced high-performance electron microscope.
Nikon Eclipse E 400  Color Imaging System

The Nikon Color Imaging system consists of a Nikon Eclipse E400 upright microscope, and Nikon DXM 1200F high-resolution camera. The system also utilizes Nikon Imaging Software. The charge for this instrument is $5/hr.

Imaris 8.41 Imaging Station

The Imaris Imaging station is a high-power workstation with Bitplane's Imaris Imaging software installed. Imaris provides functionality for the visualization, segmentation, and interpretation of 3D and 4D microscopy datasets. The charge for this instrument is $10/hr.

Imaris 9.1 Imaging Station

This Imaging station is a high-power workstation with Nikon's NIS-Elements Imaging software installed. NIS-Elements provides cutting-edge tools for image manipulation and data management. The charge for these instruments is $5/hr.
Autoquant Deconvolution Station
This Imaging workstation has both AutoQuant and Nikon's NIS-Elements Imaging software installed. AutoQuant is used to deconvolve images acquired in the facility. The charge for this instrument is $10/hr. To book time on these systems use the Bioimaging SharePoint Calendar at:

Belfer NIS-Elements Analysis with Deconvolution
This Imaging workstation has Nikon's NIS-Elements Imaging software installed. Additionally, it has Element's deconvolution module installed. The charge for this instrument is $5/hr.

Gemini EM Microplate Spectrofluorometer
The Molecular Devices SpectraMax Gemini EM Microplate Spectrofluorometer features top and bottom reading optics, dual excitation wavelength scanning, well scanning, auto PMT gain and is driven by Softmax Pro software on a Windows-based controller. The charge for this instrument is $5/scan.
Amersham Biosciences Typhoon 9410
Typhoon is a highly sensitive variable-mode gel imager. The Typhoon 9410 unites the ability to detect an extensive range of autoradiography technology and direct imaging of chemiluminescence. The typhoon can also be used to analyze microarrays. The charge for this instrument is $5/scan.

Belfer GE FLA 7000 Typhoon FLA
Typhoon FLA 7000 is a fast laser scanner for biomolecular imaging applications including sensitive and quantitative measurements of radioisotopic labels, chemifluorescent Western blots, and single fluorescence. The charge for this instrument is $5/scan.

Odyssey Infrared Imager
The Odyssey replaces traditional methods of analyzing western blots, chemiluminescence, and fluorescence. It is equipped with two infrared channels (700 nm and 800 nm), and can thus probe two different targets in the same experiment. The charge for this instrument is $5/scan.
Biotek PowerWave Microplate Reader

PowerWave HT is a multi-channel reader for maximum speed in both 96- and 384-well plate formats. The PowerWave HT supports kinetic and spectral scanning mode. Powerful Gen5 PC-based software is used for system control and data analysis.

The charge for this instrument is $3/scan.

Belfer Bio Tek Synergy HTX Microplate Reader

Synergy HTX is a Multi-Mode Microplate Reader for making: absorbance, fluorescence, luminescence and AlphaScreen/AlphaLISA measurements on 6- to 384-well microplates.

The charge for this instrument is $3/scan.

GloMax®-96 Microplate Luminometer

GloMax®-96 Microplate Luminometer is a state-of-the-art Microplate Luminometer that measures light output in 6- to 96-well plates.

The charge for this instrument is $5/scan.
### Objectives of Microscopes in the Bio-imaging Facility

<table>
<thead>
<tr>
<th>Objective</th>
<th>Elements Analysis Workstation</th>
<th>VoToClite Analysis Workstation</th>
<th>Nikon Eclipse Ti With Ultra High-Speed Wavelength Source</th>
<th>Nikon SIM/TIRF</th>
<th>Leica Sp8 Confocal</th>
<th>Leica Sp2 Confocal</th>
<th>PerkinElmer Spinning Disk Microscope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detection Mode</td>
<td>Typhoon 9410 Imager</td>
<td>Biotek PowerWave</td>
<td>SpectraMax</td>
<td>LI-COR Odyssey</td>
<td>LI-COR Odyssey</td>
<td>LI-COR Odyssey</td>
<td>LI-COR Odyssey</td>
</tr>
<tr>
<td>Application</td>
<td>In-Gel Western Assay</td>
<td>In-cell Western Assay</td>
<td>Protein Quantitation</td>
<td>ELISA Enzyme Kinetics</td>
<td>Cell Viability, Proliferation, and Cytotoxicity Enzyme Assays</td>
<td>Cell Viability, Proliferation, and Cytotoxicity Enzyme Assays</td>
<td>Cell Viability, Proliferation, and Cytotoxicity Enzyme Assays</td>
</tr>
<tr>
<td>Detection</td>
<td>Fluorescence</td>
<td>Fluorescence</td>
<td>Fluorescence</td>
<td>Fluorescence</td>
<td>Fluorescence</td>
<td>Fluorescence</td>
<td>Fluorescence</td>
</tr>
<tr>
<td>Spectral Range/ Wavelength</td>
<td>300-650nm</td>
<td>300-650nm</td>
<td>532nm/633nm</td>
<td>457nm/488nm</td>
<td>457nm/488nm</td>
<td>457nm/488nm</td>
<td>457nm/488nm</td>
</tr>
</tbody>
</table>

### Remote Instrumentation Service

**Remote Instrumentation Service Purpose**

- **Volocity Analysis Workstation:** For advanced analysis of microscopic images.
- **Elements Analysis Workstation:** For elemental analysis of samples.
- **Nikon Eclipse Ti With Ultra High-Speed Wavelength Source:** For high-speed imaging with various spectral ranges.
- **Nikon SIM/TIRF:** For total internal reflection fluorescence microscopy.
- **Leica Sp8 Confocal:** For confocal microscopy with various spectral ranges.
- **Leica Sp2 Confocal:** For high-resolution confocal imaging.
- **PerkinElmer Spinning Disk Microscope:** For spinning-disk confocal imaging.

### Guidelines For using The Facility

**Rules of Operations**

- Only one reservation per time slot per machine.
- Users may have no more than 2 reservations made on a calendar at one time for any single machine.
- Come 30 minutes late you will lose your reservation.
- You can create an account to make a reservation at the facility reservations website.
- Sign the logbook. If you leave your samples in the facility, come 30 minutes late you will lose your reservation.
- Maximum reservation time is 6 hours.
- Maximum number of reservations per time slot is 1 per machine.
- Your samples can stay in the facility for up to 30 minutes after usage.
- Advisory: Users must not leave their samples in the facility.

**Remote instrumentation service**

- **Purpose:** For scheduling a remote microscopic imaging experiment.
- **Remote Instrumentation Service:**
  - **Volocity Analysis Workstation:** Utilize PVX monitoring system to setup Internet video conferencing for remote control of the microscope for their experiment through a simple Internet connection. Our service includes confocal microscopes for their own imaging purpose.
  - **Elements Analysis Workstation:** During imaging experiment, PVX provides real-time conferencing: PVX video conferencing operational guide.
  - **Nikon Eclipse Ti With Ultra High-Speed Wavelength Source:** PVX video conferencing for real-time consultation: during imaging experiment, PVX provides real-time conferencing. Please check the following link for PVX video conferencing system is used for real-time conversations between microscope operator and remote users to solve on-site experimental issues.
  - **Nikon SIM/TIRF:** Please check the following link for WebEx-based remote control.

**Recommended Laser Wavelengths**

- **Solid State Laser:**
  - 395 nm
  - 405 nm
  - 442 nm
  - 488 nm
  - 561 nm
  - 594 nm
  - 633 nm
  - 640 nm
  - 635 nm

- **SYAG Laser:**
  - 476 nm

- **Leica SP2 Confocal:**
  - 457 nm
  - 488 nm
  - 514 nm
  - 561 nm
  - 640 nm

- **Leica Sp8 Confocal:**
  - 532 nm
  - 561 nm
  - 633 nm

- **TIRF Module:**
  - 488 nm

- **Nikon TIRF/SIM Room 826 HN:**
  - 514 nm

- **Solid State Laser:**
  - 405 nm
  - 488 nm
  - 635 nm

**Costs and Charges**

- There is a $5 minimum charge, and fractions of an hour count as whole hours.
- **0 - 4 hours:** $10/hour
- **4 - 8 hours:** $15/hour
- **8 - 12 hours:** $20/hour
- **12 - 16 hours:** $25/hour
- **16 - 20 hours:** $30/hour
- **20 - 24 hours:** $35/hour

**Data Handling**

- **Automation:** Automated event log on the computer attached to the machines.
- **Volocity Analysis Workstation:**
  - $10 minimum charge, and fractions of an hour count as whole hours.

**Acknowledgment**

This project was supported by a Research Centers in Minority Institutions Program grant from the National Institute on Minority Health and Health Disparities (MD007599) of the NCRR. Suggested language for the acknowledgment would be, "This project was supported by a Research Centers in Minority Institutions Program grant from the National Institute on Minority Health and Health Disparities (MD007599) of the NCRR."