

BCRL Facilities

The BioSpectroscopy Core Research Laboratory (BCRL) is located in both the Skaggs (060B) and Chemistry (013) buildings at the University of Montana (UM). The facility includes an approximately 900 square foot wet chemistry lab for sample preparation and an adjacent 450 sq. ft. laser lab dedicated to the single-molecule and time-resolved spectroscopy studies. Office space for the BCRL Director (100 sq. ft.) is on the same floor as the wet chemistry lab.

The BCRL spectroscopy/laser laboratory (900 square feet) is located in the adjacent Skaggs Building. It includes separate bays for two time-resolved confocal microscopes (PicoQuant MicroTime 200 and Zeiss 880 LSCM with PicoQuant Time-Resolved upgrade) and a third bay equipped with two optical tables (4x8' and 4x10'). Temperature control for the entire room is regulated within 0.5°C with humidity control.

The BCRL has office space for the Director and Lab Manager, equipped with PC and Mac computers. The BCRL has a 64-bit workstation dedicated to analysis, used by BCRL personnel and Core Users. Computers are connected to the university network, which allows rapid access to outside databases and web editions of journals.

Resources

Operations & Maintenance (Financial & Personnel)

The BCRL has a facility manager who is responsible for all instrument maintenance, user training, and user support. The UM Office of Research & Creative Scholarship (VPRCS) and the Center for Biomolecular Structure and Dynamics (CBSD) provide direct and ongoing support of the operations and maintenance of the BCRL through partial salary support of the BCRL Manager and Director. Additionally, BCRL operations are supported through recharge (user fees, which are posted on the BCRL website).

Other Available Support Services

The Molecular Computational Core Facility (MCCF) at UM supports the BCRL through remote data storage for archival purposes.

BCRL Equipment

- Coherent Chameleon femtosecond-pulsed laser: multi-photon spectroscopy
- PicoQuant picosecond pulsed laser diodes: LDH-420, LDH-440, LDH-470, LDH-480, & LDH-640
- PicoQuant laser diode drivers: PDL 828 *Sepia II*, PDL 800-B
- Qpod homemade time-resolved fluorometer with Hamamatsu PMTs (UV & near infrared-sensitive).
- PicoQuant TCSPC data acquisition: MultiHarp 150 (nanosecond lifetime acquisition) & NanoHarp 250 (microsecond lifetime acquisition)
- Nikon TE2000-U epi-fluorescence microscope with TIRF illumination arm and Andor iXon 897 *Ultra* EMCCD camera; 420, 440, 470, 480, 552 and 640 nm excitation. OBIS 552 LS, PicoQuant LDH-420, LDH-440, LDH-470, LDH-480, & LDH-640).
- Edinburgh DS5 Dual beam spectrometer.
- Software: PicoQuant EasyTau, PicoQuant Fluofit Pro, PicoQuant SymPhoTime 64, Matlab, Origin, Image J, Igor pro.
- PicoQuant *MicroTime200* time-resolved confocal microscope: fluorescence correlation spectroscopy, fluorescence lifetime imaging, and single-molecule investigations. The PicoQuant *MicroTime200* provides picosecond pulsed excitation at 420, 440, 485, 510, 595 and 640 nm.
- Zeiss 880 Laser-Scanning Confocal Microscope with environmental chamber, Aisycan detector and PicoQuant Upgrade including, fluorescence correlation spectroscopy, and time-resolved fluorescence capabilities. Zeiss 880 with PicoQuant upgrading unit provide cw excitation at 405, 458, 488, 514, 567, and 633 nm and pulsed excitation at 440, 485, and 640 nm.
- 64-bit workstation with ZEN Blue 3.6 and Airyscan joint deconvolution dedicated to data analysis
- Mac and PC Computers connected to the university network, which allows rapid access to outside databases and web editions of journals
- Horiba Duetta-bio steady-state fluorimeter with temperature control and polarizers