Core Facility & Service Center
Open House
Resources for your research needs

Monday, June 1, 2015

Hosted by

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Office of the Vice Chancellor for Research
Office of Industry Collaboration
Department of Molecular, Cellular and Developmental Biology
Genomics

BioFrontiers Next-Gen Sequencing Facility
Contact: Jamie Kershner
Department: BioFrontiers Institute
303-735-1255
Location: JSCBB C1B76
Jamie.prior@colorado.edu
Web: https://bficores.colorado.edu/sequencing-lab
Description: The sequencing facility has several Illumina sequencer including 2 MiSeqs and a HiSeq 2000. We also support sequencing library construction, either as a provided service or provide access to instrumentation for library QA/QC. We have several pieces of equipment available to users including a Qubit, Bioanalyzer, and QuantStudio 6 qPCR. Consultations with the Director (Jamie Kershner) are encouraged at any point during a project from early planning stages to sample submission for sequencing. External projects both within academia and biotech industry are welcome. Please see our website for a complete listing of our equipment and services.

Functional Genomics Facility
Contact: Molishree Joshi
Department: MCDB
303-492-7529
Location: Porter B140
funcgenfac@colorado.edu
Web: http://functionalgenomics.colorado.edu/index.html
Description: The FGF is a non-profit core facility that aims to promote scientific research in the area of functional genomics in Colorado. Over time, our core facility has become one of the largest repositories of functional genomics tools in the world. We administer a human shRNA collection (176,283 clones targeting >22,000 unique genes), a mouse shRNA collection (138,538 clones targeting >21,000 unique genes), a human Open Reading Frame (ORF) library (15,744 ORFs corresponding to 13,082 unique human genes), diverse gene knockout pooled CRISPR libraries (6 gRNAs per gene to inactive ~18,000 human genes and ~15,000 mouse genes) and a transactivating CRISPR library to induce expression of ~18,000 human promoters. We continue to identify and acquire/add key resources to advance research in the area of Functional Genomics. We also provide assistance with genome-wide screen design and analysis on a per need basis through phone, email and in person communication.
Microscopy

Biofrontiers Advanced Light Microscopy Core Facility
Contact: Joe Dragavon  
Department: BioFrontiers Institute  
303-735-6988  
Location: JSCBB C350  
Joseph.dragavon@colorado.edu  
Web: https://bficores.colorado.edu/imaging-facility  
Description: Multiple imaging technologies are available within the BioFrontiers Advanced Light Microscopy Core, including widefield (Zeiss Axiovert 200M, Nikon TE-2000, Olympus IX-81), spinning disc confocal (Nikon TiE with a Yokogawa CSUX A1), laser scanning confocal (Nikon A1R TiE), plate scanning (Molecular Devices ImageXpress), and super resolution (Nikon N-STORM). Additionally there is a dedicated platform for image analysis that includes Nikon Elements, Imaris, Matlab, ImageJ/Fiji, ICY and Cell Profiler.

Light Microscopy Core Facility
Contact: Jolien Tyler  
Department: MCDB  
303-492-5955  
Location: Porter B047A  
jolien.tyler@colorado.edu  
Web: http://mcdb.colorado.edu/facilities/lmcf  
Description: The LMCF houses a wide range of widefield and confocal fluorescence light microscopes. In addition to our Nikon spinning disk and Zeiss laser scanning confocals, we have a combination Nikon A1 laser scanning confocal and SIM structured illumination super-resolution microscope. SIM super-resolution is amenable to a wide range of sample types and can achieve a two-fold resolution improvement over conventional microscopy techniques.

Boulder Electron Microscopy Services
Contact: Tom Giddings  
Department: MCDB  
303-492-8402  
BoulderEM@colorado.edu  
Web: http://mcdb.colorado.edu/facilities/ems/  
Description: The CU-Boulder Electron Microscopy Service provides access to a full range of transmission electron microscopy imaging services including conventional TEM, electron tomography and cryo-electron microscopy. The facility houses three conventional transmission electron microscopes (Philips CM10, Philips CM100 and Tecnai Spirit BioTwin) and two intermediate voltage transmission electron microscopes (200kV FEI Tecnai F20 and 300kV FEI Tecnai F30). Supported specimen preparation services include negative staining, chemical fixation, high pressure (Wohlwend Compact 02 HPF) and plunge freezing (FEI Vitrobot), freeze-substitution, plastic- and cryo-sectioning, immuno-labeling, freeze-fracture and low-angle rotary shadowing.
Electron Microprobe Laboratory

Contact: Dr. Julien Allaz        Department: Geological Sciences
        Julien.allaz@colorado.edu        Location: Benson, 125B
Web: http://geode.colorado.edu/~jallaz/index.php?page=microprobe
Description: An electron microprobe is an electron microscope designed for the non-destructive X-ray microanalysis and imaging of solid materials. It is capable of high spatial resolution (1 µm beam size) and relatively high analytical sensitivity. The analytical facilities' JEOL JXA-8600 can acquire digital secondary-electron and backscattered-electron images as well as elemental x-ray maps. It is equipped with 4 wavelength-dispersive spectrometers and an energy-dispersive spectrometer. Most of the periodic table can in principle be analyzed (Be through U), subject to several important considerations. In early 2016, a new instrument will be installed (JEOL JXA-8230), which will considerably increase our analytical capabilities, notably for trace elements analysis (down to 10 ppm), and spatial resolution (0.7-0.2 µm). The new instrument will include 5 spectrometers, a solid-state EDS detector capable of light element detection, and a panchromatic CL detector. We are open to internal and external researchers, as also to industry/private users! Laboratory visit can be arranged.

Freeze-Fracture Transmission Electron Microscopy

Contact: Mike Tuchband        Department: Physics
        michael.tuchband@colorado.edu        Location: Duane, E2B32
Web: https://smrc.colorado.edu/facilities/FFTEM_system.html
Description: Freeze-fracture transmission electron microscopy (FFTEM) is a powerful replica-based technique for imaging the nanometer-scale structure of soft materials, revealing features as small as a few nanometers. We use FFTEM to study the bulk and interfacial structure of equilibrium and non-equilibrium states of liquid crystals, nanocolloids, and other nanostructured soft materials.
Flow Cytometry

Flow Cytometry Shared Core
Contact: Theresa Nahreini  
Department: Chem Biochem  
303-492-3585  
Location: JSCBB  
nahreini@colorado.edu

Description: High-performance analysis and sorting of mammalian cells, bacterial, yeast, algae and nanoparticles. We currently offer 488 and 561 nm lasers with plans for a 445 nm excitation source. Up to 4 way sorting options are available.

Flow Cytometry Facility
Contact: Yuming Han  
Department: MCDB  
303-492-2724  
Location: Porter B059, B051  
yhan@colorado.edu

Web: http://mcdb.colorado.edu/facilities/flow_cyt/  
Description: With a CyAN ADP Analyzer and a MoFlo XDP Cell Sorter, the MCDB Flow Cytometry Facility offers state-of-art cell sorting and analysis service to the growing user groups in Boulder biomedical research community. The Cyan ADP Analyzer accommodates a diverse range of applications up to 11 parameters and 9 colors for analyzing mammalian cells, yeast, bacteria and other cells. MoFlo XDP Cell Sorter, also with 3 lasers and 9-color capacity, can perform 4-way sorting of various mammalian cells. It enables configuration modularity to meet the diverse sorting applications including those for 96-well plates.

Spectroscopy

Central Analytical Mass Spectrometry & Proteomics Facility
Contact: Jeremy Balsbaugh  
Department: Chem Biochem  
303-735-4019  
Location: JSCBB C1B90  
jeremy.balsbaugh@colorado.edu

Web: http://chem.colorado.edu/massspec/  
Description: We specialize in proteomics-based mass spectrometry analyses that implement high resolution liquid chromatography separations and instruments capable of high resolution, accurate mass determinations. We routinely provide bioinformatics data processing for all datasets. We also provide additional analyses including, but not limited to, the identification and quantitation of small organic molecules, oligonucleotides, peptides, proteins and polymers using a variety of instruments and mass spectrometry-based methods.
NMR Spectroscopy Facility
Contact: Richard Shoemaker  Department: Chem Biochem
        Richard.shoemaker@colorado.edu
Location: Cristol (CHEM-02) and JSCBB (C1B82)
Web: http://chemnmr.colorado.edu
Description: NMR Spectroscopy for small molecules, and materials. Field/Frequencies from 300MHz to 500MHz, with solid-state (MAS) NMR capabilities at 400MHz. Hands-on operation is available for most user-groups, as well as service spectroscopy when requested and as appropriate.

High-Field NMR Facility
Contact: Geoff Armstrong  Department: Chem Biochem
        Geoffrey.armstrong@colorado.edu
Location: CU Boulder CINC Building and CU Anschutz Medical Campus
Web: http://cunmr800.colorado.edu
Description: 800 and 900 MHz NMR Spectrometers with Cryogenically cooled probes. Structure determination with Rosetta.

Raman Microspectroscopy Lab
Contact: Eric Ellison  Department: Geological Sciences
        303-492-7025  Location: Benson 125A
        Eric.ellison@colorado.edu
Web: spot.colorado.edu/~templeta/Templeton_Lab/Raman_Lab.html
Description: The Raman Microspectroscopy Lab is equipped with a Horiba LabRAM HR Evolution Raman microscope-spectrometer capable of fast, non-destructive chemical imaging and vibrational characterization of a diversity of material types, including minerals (thin sections & powders), biological samples, fluids, dissolved gases, and much more. Technical assistance is always available, both during and after data collection. We also provide access to state-of-the-art multivariate statistical/chemometric software for analysis of hyperspectral Raman image data.

Computation

BioFrontiers Computing Core
Contact: Dan Timmons  Department: BioFrontiers Institute
        303-492-7579  Location: JSCBB
        Dan.timmons@colorado.edu
Web: https://bficores.colorado.edu/biofrontiers-it
Description: The BFI Computing cores mission provides high-powered computing services to the BioFrontiers core faculty, BioFrontiers core sequencing and imaging facilities and limited services to BioFrontiers collaborators.
X-ray and High Throughput Screening

Macromolecular X-Ray Crystallography
Contact: Dave McKay  
Department: Chem Biochem  
David.mckay@colorado.edu  
Location: JSCBB C1B51  
Web: https://biofrontiers.colorado.edu/core-facilities/x-ray-crystallography  
Description: For macromolecular crystallography: robotic crystallization dropsetter; crystallization imagers; in-house data collection systems with cryocooling; hardware for remote data collection at synchrotrons

X-Ray Diffraction Facility
Contact: Rayshan Visvanathan  
Department: Physics  
rayshan.visvanathan@colorado.edu  
Location: Duane C232  
Web: https://smrc.colorado.edu/facilities/xrd_waxs.html  
Description: A custom-built wide angle x-ray scattering (WAXS) system with a Huber 4-circle goniometer capable of accommodating large sample chambers (such as temperature-controlled ovens), this diffractometer is used routinely for structural characterization of liquid crystalline, polymeric and biological materials, x-ray reflectivity measurements on thin films, and high-resolution powder diffraction of polycrystalline materials. We are currently in the process of acquiring a custom built, modular small-angle x-ray scattering (SAXS) diffractometer with a high-brilliance x-ray source and a high-resolution area detector with single-photon sensitivity, and with a beam path that can be reconfigured for SAXS, WAXS, and grazing-incidence (GISAXS) measurements. We anticipate that this system will come on line near the end of September 2015.

High-Throughput Screening Core Facility
Contact: Wei Wang  
Department: Chem Biochem  
303-492-9123  
wang.wei@colorado.edu  
Location: Cristol  
Web: http://chem.colorado.edu/cub_hts  
Description: The HTS Core Facility is a non-profit facility, which aims to promote chemical biology research and drug discovery at CU-Boulder and the surrounding areas. Our facility is equipped with state-of-the-art instruments for both high-throughput and high-content biochemical and cell-based assays, including live-cell assays. We offer assistance on all steps involved in typical drug-discovery processes: (1) Assay development, optimization and validation, (2) High-throughput screening, (3) Data analysis, validation and lead identification, and (4) SAR studies and large-scale production. In addition, we offer access to the complete package of Schrodinger Suite for in silico screening and post-screen cheminformatic analysis.
General Instrumentation

Biochemistry Shared Instruments Core
Contact: Annette Erbse
Department: Chem Biochem
303-492-0528
Location: JSCBB
erbse@colorado.edu
Web: http://chem.colorado.edu/biochemcore
Description: Investigators of the Biochemistry Division of the Department for Chemistry and Biochemistry at the University of Colorado at Boulder have joined forces and placed some of their State-of-the-Art instrumentation in the newly established instrument core to facilitate the sharing of instrumentation and analysis capabilities. The instrument core gives researchers in the department but also from the broader CU community and from outside the university access to a multitude of state of the art instruments and techniques including EPR, CD and fluorescence spectroscopy, DLS, Sec-MALS and ITC. For measurements of fast reaction kinetics it offers stopped-flow and chemical quench flow techniques. In addition it houses a variety of additional equipment, such as imaging systems, centrifuges, scintillation counter, sonicator and more.

Cleanroom and Fabrication

JILA Clean Room and Metrology Lab
Contact: David Alchenberger
Department: JILA
303-492-2389
Location: JILA X131 and S105
alchenbd@jila.colorado.edu
Web: http://jila.colorado.edu/scientific-support/keck-lab
Description: Metrology Lab: Optical measurement and characterization instruments fabrication. Clean Room: a suite of Class 1000 (ISO 6) and Class 100 (ISO 5) cleanroom bays. Though designed to support research at JILA, the facility is also available to other University of Colorado researchers and local industry on a space-available basis.

Chemical & Biological Engineering Instrument Shops
Contact: Dragan Mejic
Department: ChBE
dragan.mejic@colorado.edu
Location: JSCBB Basement
Description: Complete design and fabrication of mechanical and electronic devices including flow cells, high temperature and high-pressure reactors, electromechanical assemblies, custom microscope stages, heating and control circuits, and many more.
Electronics Design and Build Shop
Contact: Maria Toscano-Leary and Dana Hauschulz
        maria.toscano@colorado.edu, dana.hauschulz@colorado.edu
Department: ChBE
Location: JSCBB B1B01
Description: We design and build electro/mechanical equipment. We also troubleshoot systems and repair lab equipment.

Colorado Nanofabrication Laboratory/Nanomaterials Characterization Facility
Contact: Tomoko Borsa
        borsa@colorado.edu
Web: http://cnl.colorado.edu
Department: ECEE
Location: CNL (ECEE 2nd floor)
NCF (DLC 2B floor)
Description: CNL: Fabrication tools including lithography, thin film deposition and etching.
NCF: Characterization tools including FIB (TEM sample preparation), FESEM, SEMs, AFM and EM sample preparation capability