

## The UCLA Molecular Instrumentation Center

The UCLA Molecular Instrumentation Center (MIC) is a state-of-the-art campus-wide facility dedicated to enabling the use of modern instrumentation in molecular characterizations ([www.mic.ucla.edu](http://www.mic.ucla.edu)). The MIC is housed within and managed through the Department of Chemistry and Biochemistry. The professional staff consists of twelve Ph.D. level staff members, one postdoctoral fellow, and one graduate student assistant. The staff is responsible for operating, maintaining, and upgrading the equipment, training users, and providing consultation for the application of modern instrumentation to a large variety of disciplines. The following equipment is part of the UCLA Molecular Instrumentation Center:

### ***Magnetic Resonance:***

- Bruker AV800 broad band FT NMR Spectrometer – optimized for biostructural NMR
- Bruker AV600 broad band FT NMR Spectrometer - all nuclei
- Bruker DRX 500 broad band FT NMR Spectrometer - all nuclei
- Bruker ARX500 broad band FT NMR Spectrometer - all nuclei
- Bruker ARX400 broad band FT NMR Spectrometer with probe for  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{31}\text{P}$ , &  $^{19}\text{F}$
- Bruker AV300 broad band FT NMR Spectrometer - all nuclei
- Bruker DSX300 broad band FT NMR Spectrometer for Solid-State samples
- Bruker EMX EPR Spectrometer with X-band and low temperature capability

### ***Mass Spectrometry:***

- Applied Biosystems-MDS Sciex 4000 Q Trap with Autosampler
- Applied Biosystems Q-Star Elite Quad-TOF Hybrid LC/MS/MS system
- IonSpec Ultima 7T FT-ICR-MS with ESI and MALDI ion sources
- Applied Biosystems Voyager-DE STR MALDI – TOF
- Thermo Finnigan LCQ Deca Ion Trap MS with Autosampler and PDA
- Agilent 6890-5975 GC-MS with Autosampler
- Waters LCT Premier with ACQUITY LC and autosampler

### ***X-ray diffraction:***

- Bruker AXS CCD-Array single crystal X-ray Diffractometer
- Bruker AXS X8 Prospector APEX II single crystal X-ray Diffractometer
- Bruker AXS D8 Discover Powder X-ray Diffractometer
- Bruker AXS D8 Discover with GADDS Powder X-ray Diffractometer
- Panalytical Powder X-ray Diffractometer
- Zeiss Stereo Discovery V12 Microscope

### ***Materials Characterization:***

- Quantum Design Magnetic Properties Measurement System (SQUID)
- Zeiss Optical Microscope (reflectance optics, CCD camera)
- JEOL Scanning Electron Microscope (SEM) with Energy Dispersive Spectroscopy (EDS)
- Perkin Elmer Diamond Differential Scanning Calorimeter (DSC)
- Perkin Elmer Diamond Thermogravimetric/ Differential Thermal Analyzer (TG/DTA)
- First Ten Angstroms Contact Angle Goniometer
- Coulter Beckman Static Light Scattering Particle Analyzer – LS13 320
- Coulter Beckman Dynamic Light Scattering Analyzer – N4 Plus
- Shimadzu UV/Vis/NIR Spectrophotometer (transmission, specular reflectance, diffuse reflectance)
- Veeco Multimode Atomic Force Microscope (AFM)
- Ocean Optics Fluorimeter
- Jasco 420 FTIR Spectrophotometer

- Agilent LCR meter
- Ancillary materials synthesis & characterization equipment, e.g. tube furnaces, spin coaters, sputterer, centrifuge, etc.
- Kratos XPS Axis Ultra DLD (on order for early 2010 delivery)

### ***Proteomics and Biochemistry Instrumentation:***

#### Proteomics Laboratory:

- Amersham TE62 Transfer Unit
- Bio-Rad Protean Isoelectric Focusing Cell
- Bio-Rad Criterion Dodeca Electrophoresis Cell
- Bio-Rad Criterion Electrophoresis Cell
- Bio-Rad Protean II xi Electrophoresis Cell
- Bio-Rad Protean Plus Dodeca Electrophoresis Cell
- Bio-Rad Fx Fluorescence Imager
- Bio-Rad GS-800 Densitometer
- Nonlinear Dynamics Progenesis SameSpots 2-D Analysis Software
- Bio-Rad PDQuest 2-D Analysis Software
- Thermo Finnigan LTQ FT Mass Spectrometer with Eksigent HPLC
- Agilent LC-MS Ion Trap Mass
- Thermo Scientific Sorvall Legend RT+ Centrifuge for Proteomic Sample Preparation
- Thermo LTQ Orbitrap XL Mass Spectrometer with Eksigent NanoLC-2D HPLC
- DIGILAB Genomics Solutions ProPic II Spot Cutter
- Laminar flow hood for keratin-free work (to be installed Fall 2009)
- Eighteen node Linux cluster for Proteomic Bioinformatics and Data Analysis
- Mascot Search Engine for protein identification from MS data
- OMSSA and ProLuCid Database Search Engines for peptide and protein identification using MS data
- Scaffold Software for validating, organizing, interpreting & comparing MS database search results from one or more search engines
- Census Quantitative software for quantitating MS labeling experiments
- Compaq AlphaServer DS20 & Dell PowerEdge6800 server for running proteomics and bioinformatics packages developed in Unix/Linux platform
- Two Dell T3400 Workstations to host window-based proteomics tools

#### UCLA-DOE Biochemistry Instrumentation Facility:

- Hewlett-Packard HP8453 diode-array UV/Visible spectrophotometer with Peltier temperature control
- Photon Technology International QuantaMaster Spectrofluorimeter
- JASCO J-715 Circular Dichroism spectrophotometer, with Peltier temperature control and auto-titration attachments
- Applied Photophysics SX.18MV microvolume stopped-flow spectrometer
- Beckman Model XL-A analytical ultracentrifuge
- Mettler/Paar DMA O2D Precision Density Meter
- Biacore T-100 Surface Plasmon Resonance System
- Calorimetry Sciences Corporation Nano-II 6100 Differential scanning calorimeter
- Bio-Rad FX Pro plus Fluorimager/PhosphorImager
- Alphamager 2000 CCD camera Gel imaging system
- Alpha Innotech FluorChem FC2 Imaging System
- Deltavision Spectris microscope with bright-field condenser
- Beckman LS6500 Liquid Scintillation counter
- French Press

#### Elemental Analysis and Speciation:

- Agilent 7500ce ICP-MS – Mass Spectrometry detection

- Agilent 1200 HPLC
- CETAC ASX-510 ULPA-filtered Autosampler
- TJA Radial IRIS 1000 ICP-OES – Optical Emission detection
- Semi-clean Digestion Room

Date of last update: 9/21/2009