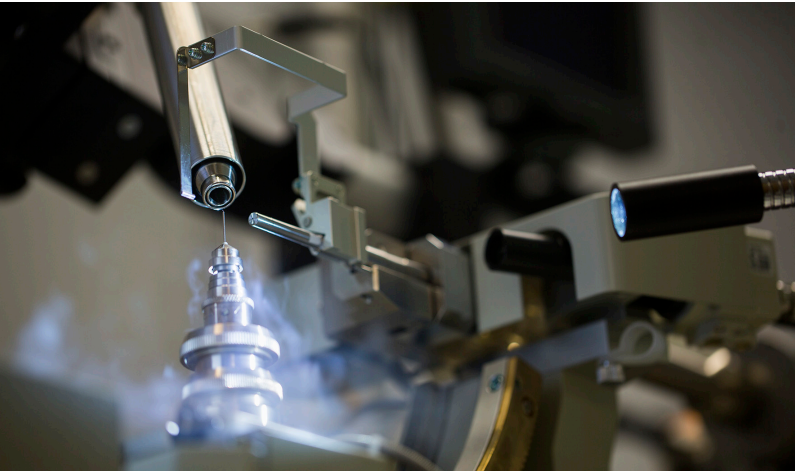


Biophysical Characterization



umass.edu/ials/biophysical-characterization

Located on the 5th floor in the Life Science Laboratories the Biophysical Characterization facility houses 15 state-of-the-art instruments for the study of structures and interactions of biological macromolecules such as proteins, nucleic acids, lipids, and complexes.

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 Lizz Bartlett at dbartlett@umass.edu or (413) 577-0560.

Our rates are competitive and tiered based on needs and usage. Visit our website at umass.edu/ials/biophysical-characterization 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 Biophysical Characterization (Lizz Bartlett) or online through FOM (Facilities Online Manager) at fom.umass.edu/fom

UMassAmherst | Core Facilities

Institute for Applied Life Sciences
University of Massachusetts Amherst
Life Science Laboratories
240 Thatcher Road
Amherst, MA 01003



Research and Innovation to Translate Basic Science
into Product Candidates

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Biophysical Characterization Inquiries

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UMass Core Facilities Inquiries

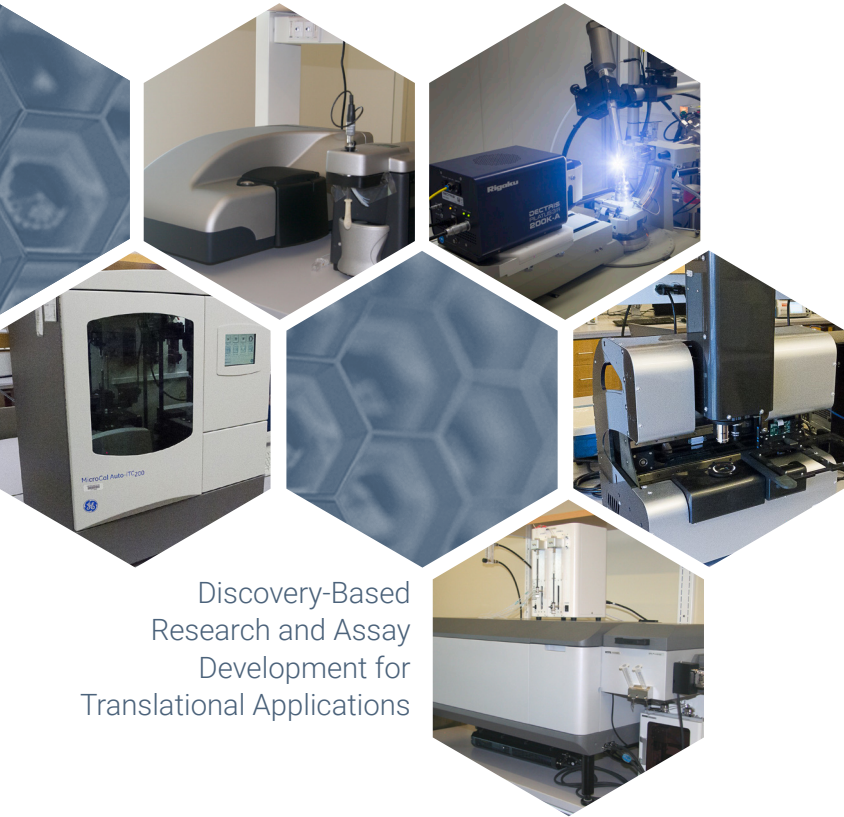
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Biophysical Characterization

Institute for Applied Life Sciences
University of Massachusetts Amherst



Discovery-Based
Research and Assay
Development for
Translational Applications

Revision (01/29/19)

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EQUIPMENT

Beckman ProteomeLab XL-I Analytical Ultracentrifuge with Fluorescence Detection System

The ProteomeLab XL-I is used for in-solution characterization of proteins, oligomers, aggregates, particles, colloids, and small structures. The analytical ultracentrifuge in the facility can be used for several types of experiments, but the two most widely used are sedimentation velocity and sedimentation equilibrium.



BioTek Synergy 2

discovery. Detection modes include Fluorescence Intensity, Fluorescence Polarization, Time-Resolved Fluorescence, AlphaScreen, Luminescence and UV-visible Absorbance.

Formulatrix Robotics System for Crystallization

Formulator 10 The Formulator 10 is a liquid handling system that is used to generate formulation combinations in 96 well plates for crystallization experiments.

NT8 The NT8 is a nanoliter-volume liquid handler with drop dispensing capability for adding protein to 96 well plates in crystallization experiments.

GE Biacore T200

Using the technique of surface plasmon resonance, the Biacore T-200 measures binding events using ligands immobilized on to a gold chip sensor. Applications include characterizing molecular interactions of small molecules, proteins, antibodies, nucleic acids, lipids and other biomolecules.

GE Typhoon FLA 9500

Typhoon FLA 9500 is a variable mode laser scanner with modular access to the optical components, providing both versatile and flexible imaging for precise quantitation of proteins, nucleic acids, and other biomolecules.

Jasco J-1500 Circular Dichroism Spectrophotometer

Circular dichroism (CD) spectroscopy is a powerful technique to probe the secondary and tertiary structures of proteins and peptides. The Jasco J-1500 and the accessories allow researchers to run a wide range of experiments.

LI-COR Odyssey CLx imaging system

The Odyssey CLx imaging system from LI-COR allows researchers to analyze and quantify up to nine miniblots or six microplates in a single scan. Even faint bands can be imaged and analyzed. The resulting images are of publication quality.

Malvern Auto-iTC200

The Malvern Auto-iTC200 is a fully automated (cleaning steps, titrations, filling cells, equilibrations, etc.) low volume, highly sensitive isothermal titration calorimeter. Applications include characterizing molecular interactions of small molecules, proteins, antibodies, nucleic acids, lipids and other biomolecules.

Malvern Zetasizer ZSP- Dynamic Light Scattering (DLS) System

The Zetasizer Nano ZSP incorporates three techniques (dynamic and static light scattering, microelectrophoresis) in a single compact instrument. There is a range of options and accessories so researchers can measure: particle and molecule size distributions, zeta potential, and molecular weights.

Nanotemper Monolith Thermophoresis Instruments

(one for intrinsic fluorescence reporters and one for extrinsic reporters)

Microscale Thermophoresis (MST) is a powerful method to quantify biomolecular interactions. It measures the motion of molecules along microscopic temperature gradients and detects changes in their hydration shell, charge or size and translates this into a measure of binding affinity.

Rock Imager 2

The Rock Imager 2 has both visible and UV imaging capabilities



Rock Imager 2

and can be used as a high-powered microscope to manually explore the contents of your plates for crystals.

X-Ray Scattering

Rigaku BioSAXS-2000 small angle x-ray scattering system

Rigaku's BioSAXS-2000 SAXS (Small Angle Xray Scattering) provides a wide range of information, is non-intrusive, and does not require a crystal. Experiments are performed in solution and precious samples may be retrieved.



Rigaku BioSAXS 2000

Rigaku XtaLAB PRO MM007 Xray diffractometer

The XtaLAB PRO MM007 is designed around the popular HPAD (hybrid pixel array detector) technology and is used for single crystal x-ray diffraction studies.

Wyatt Technology/ Agilent SEC-MALS

Size Exclusion Chromatography-Multi-Angle Light Scattering (SEC-MALS) measures molar mass directly, independent of elution time. As an absolute technique, SEC-MALS is used to characterize such attributes as the aggregation state of proteins and the stoichiometry of complexes.

TESTIMONIAL

“The Biophysical Characterization Core Facility at UMass Amherst is absolutely top-notch with state-of-the-art instrumentation. But the thing that separates this facility from others like it is its Director, Lizz Bartlett. With over 30 years of industry experience, she will not only guide you in selecting and setting up the instrument, but will also aid you in designing the experiment to best answer your question.”

– Joe Tilitzky, Gierasch Lab

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A significant portion of core equipment has been purchased through MLSC grant funding support.