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

MASSACHUSETTS
LIFE SCIENCES CENTER

HUMAN MOTION
Michael Busa | mbusa@umass.edu | (413) 545-1337
Assessment of human movement (free living and robot assisted) and human and robotic testing of sensor technologies.

LIVING SCIENCE CORE
Michael Busa | mbusa@umass.edu | (413) 545-1337
Evaluate biosensor performance in healthy participants or participants who are at risk for chronic disease while living in a natural environment.

MHEALTH LABORATORY
Deepak Ganesan | dganesan@cs.umass.edu | (413) 545-2450
Develops algorithms and processes for large scale wearable sensor networks to support the development of novel hardware.

ROOM CALORIMETER
Michael Busa | mbusa@umass.edu | (413) 545-1337
Capability to measure 24 hour human energy expenditure for purposes of movement sensor calibration and validation, and to conduct studies requiring assessment of energy balance and energy metabolism.

ROLL-TO-ROLL FABRICATION AND PROCESSING FACILITY
Jacob John | jjohn@polysci.umass.edu
Provides a unique set of custom, moving web-based tools for the translation of advanced materials and nanomanufacturing processes to industrially relevant scalable platforms for the development of next generation life science innovations.

SENSOR INTEGRATION
Joe Bardin | jbardin@ecs.umass.edu | (413) 545-2463
Robert Jackson | jackson@ecs.umass.edu
Miniaturizing systems in preparation for human testing.

SLEEP MONITORING LAB
Rebecca Spencer | rspencer@psych.umass.edu
Equipped with partial and whole-head EEG systems for recording sleep physiology (sleep staging). A central control room will allow for on-line observation of sleep and monitoring of sleep in populations from infants to the elderly.

Located on the UMass Worcester Campus
HIGH THROUGHPUT SCREENING
Sangram Parelkar | sangram.parelkar@umassmed.edu
Technology to acquire large amounts of high quality imaging data.

Institute for
Applied Life Sciences (IALS)
University of Massachusetts Amherst
N510 Life Science Laboratories
240 Thatcher Road
Amherst, MA 01003

(413) 577-4578
contactials@umass.edu

www.umass.edu/ials/core-facilities
CORE EQUIPMENT FACILITIES

These turnkey facilities are a significant resource for faculty research and student training in the Massachusetts and New England region, and also represent a novel interface for government and industry partners. These facilities enable faculty, student, and industry collaborators to access a broad array of equipment to enhance their R&D capabilities, address both basic and translational questions, deliver technologies and product candidates more rapidly, and become more competitive in obtaining state, federal, foundation, and private funding. A number of the UMass campuses maintain core facilities and UMass Amherst will operate more than 30 such facilities, each managed by experienced professional directors/managers. Many of these are housed in the new Life Sciences Laboratories shown on the front cover, and one – the Massachusetts Green High Performance Computing Center – is located in Holyoke. These facilities will advance the University’s objectives of becoming a “destination of choice” and a “partner of choice” as well as the Institute’s goals of supporting high quality research and advancing translational programs towards novel drug targets, drug delivery technologies, personalized healthcare devices, nutraceuticals, and other technologies that enhance human health and well being.

The overall Core Facility infrastructure was made possible by a grant from the Massachusetts Life Science Center and operational support from UMass Amherst.

ANIMAL IMAGING

Amy Burnside l aburnside@umass.edu l (413) 545-2316
Live animal imaging technologies. The IVIS animal imager is the first animal imager available in western Massachusetts.

AFM

Alex Ribbe l aribbe@polysci.umass.edu l (413) 545-2261
Scanning Probe Microscopes, which include a Bruker MultiMode AFM for high resolution, a Bruker Dimensions AFM for large scale samples and an Oxford Asylum MFP-3D for specialized experiments.

BIOPHYSICAL CHARACTERIZATION

Susanna Perkins l (413) 577-4578
Interactions between biological macromolecules like proteins, nucleic acids, lipids and their complexes, and small molecule interactions with these macromolecules.

ELECTRONIC MATERIALS

Volodimyr Duzhko l duzhko@pse.umass.edu l (413) 577-0902
Provides access and training in state-of-the-art characterization related to photoluminescent, semiconductor, and conducting materials, including device fabrication and methods for determining charge carrier mobility and solar cell efficiency.

ELECTRON MICROSCOPY

Alex Ribbe l aribbe@polysci.umass.edu l (413) 545-2261
Transmission (TEM) and Scanning (SEM) Electron Microscopes as well as related sample preparation equipment.

FLOW CYTOMETRY

Amy Burnside l aburnside@umass.edu l (413) 545-2316
Enables researchers to image structures ranging from single molecules to whole model organisms and performs microscope-based high-throughput screens.

GENOMICS RESOURCE LABORATORY

Guang Xu l (413) 577-4578
NGS DNA Sequencing, Sanger DNA Sequencing, Fragment Analysis, and Real-Time PCR available.

HUMAN MR–Coming in June 2016

James Chambers l jchambe@umass.edu l (413) 545-3864
Nikon instruments that enable a broad range of light microscopy methods and applications.

MASS SPECTROMETRY

Stephen Eyles l eyles@biochem.umass.edu l (413) 577-1528
Analytical mass spectrometry equipment, providing analytical services and expertise in mass spectrometry.

MASSACHUSETTS GREEN HIGH PERFORMANCE COMPUTING CENTER

Ralph Zottola l rzottola@umassp.edu l (774) 455-7700
Provides world-class computational infrastructure, indispensable in the increasingly sensor and data-rich environments of modern science and engineering discovery.

NANOFABRICATION CLEANROOM

Christopher Misra l chris.misra@umass.edu l (413) 545-2947
Provides access to the structural analysis of crystalline and nano electronic devices and systems.

NMR

Weiguo Hu l weiguo@polysci.umass.edu l (413) 577-1428
Elucidates molecular structure, conformation, interactions and dynamics for chemical science, materials science, biochemistry, and natural products.

NUTRICEUTICAL FORMULATION

David Prodanas l dprodana@foodsci.umass.edu l (413) 545-1013
Isolates bioactives by supercritical CO₂, concentrate bioactives by reverse osmosis, thermally treat by ultrahigh pasteurization and agitating retort produce emulsion systems by homogenization and encapsulate by freeze or spray drying.

X-RAY SCATTERING FACILITY

Alex Ribbe l aribbe@polysci.umass.edu l (413) 545-2261
Instruments dedicated to the structural analysis of crystalline materials, the determination of highly periodic morphologies in self-assembled systems over a large length scale range.

COMING IN 2016

ADVANCED DIGITAL DESIGN AND FABRICATION (ADDFAB)

Doug Eddy l dceddy@umass.edu l (413) 545-2505
State-of-the-art 3D printing and related digital manufacturing capabilities to support the translation of new technologies in biosensors and medical devices from lab bench to human testing that can then pave the way for commercialized innovative products and services.

BIOPRODUCTION/SEPARATION

Scott Garman l garman@biochem.umass.edu l 413-577-4488
Production separation and isolation of biomolecules (e.g., proteins, natural products and cells) for research, commercial and clinical purposes.

CELL CULTURE

Susanna Perkins l (413) 577-4578
Two cell culture facilities for both biological and bio-engineering approaches.

DEVICE CHARACTERIZATION LABORATORY

Doug Eddy l dceddy@umass.edu l (413) 545-2505
Sundar Krishnamurty l skirshna@ecs.umass.edu
Advanced development, fabrication, and characterization that will address the need for early stage predictability for rapid prototyping and manufacturing of medical devices.

DEVICE FABRICATION

Qiangfei Xia l qxia@ecs.umass.edu l (413) 545-4571
Offers cleanroom facilities with the tools required to make micro and nano electronic devices and systems.

EXERCISE INTERVENTION AND OUTCOMES

Michael Busa l mbusa@umass.edu l (413) 545-1337
Diagnostic testing capabilities include: exercise performance, VO2 max, exercise stress testing, strength testing, body composition (including abdominal obesity) and bone density evaluation.

HIGH FREQUENCY SENSOR DEVELOPMENT LABORATORY

Joe Bardin l jbardin@ecs.umass.edu l (413) 545-2463
Robert Jackson l jackson@ecs.umass.edu
Focuses on spectral analysis of materials and sensors at frequencies ranging from 100 GHz up through to the infrared.

FLOW CYTOMETRY

Amy Burnside l aburnside@umass.edu l (413) 545-2316
Enables researchers to image structures ranging from single molecules to whole model organisms and performs microscope-based high-throughput screens.

GENOMICS RESOURCE LABORATORY

Guang Xu l (413) 577-4578
NGS DNA Sequencing, Sanger DNA Sequencing, Fragment Analysis, and Real-Time PCR available.

HUMAN MR–Coming in June 2016

Rebecca Spencer l rspencer@psych.umass.edu
Jane Kerr l jkerr@kie.umass.edu
Non-invasive imaging and spectroscopy technologies for academic and industry-based research.

LIGHT MICROSCOPY–Coming in May 2016

(NIKON CENTER OF EXCELLENCE)

James Chambers l jchambe@umass.edu l (413) 545-3864
Nikon instruments that enable a broad range of light microscopy methods and applications.

MASS SPECTROMETRY

Stephen Eyles l eyles@biochem.umass.edu l (413) 577-1528
Analytical mass spectrometry equipment, providing analytical services and expertise in mass spectrometry.

MASSACHUSETTS GREEN HIGH PERFORMANCE COMPUTING CENTER

Ralph Zottola l rzottola@umassp.edu l (774) 455-7700
Provides world-class computational infrastructure, indispensable in the increasingly sensor and data-rich environments of modern science and engineering discovery.

NANOFABRICATION CLEANROOM

John Nicholson l jnicholson@research.umass.edu l (413) 545-2772
Device design, modeling and prototype testing in functional architectures taking best advantage of the specific hierarchical nanomanufacturing capabilities.

NMR

Weiguo Hu l weiguo@polysci.umass.edu l (413) 577-1428
Elucidates molecular structure, conformation, interactions and dynamics for chemical science, materials science, biochemistry, and natural products.

NUTRICEUTICAL FORMULATION

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Isolates bioactives by supercritical CO₂, concentrate bioactives by reverse osmosis, thermally treat by ultrahigh pasteurization and agitating retort produce emulsion systems by homogenization and encapsulate by freeze or spray drying.

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