



Convening of the Cores

Through its capital grant programs, the Massachusetts Life Sciences Center (MLSC) supports the acquisition of advanced research equipment and infrastructure which enables collaboration between industry and academia. These shared assets empower researchers across sectors at any stage to accelerate their work and expand the impact of their projects on patients' lives around the globe.

To ensure these resources are accessible and leveraged throughout the ecosystem, the MLSC maintains a public Research Equipment Database (R.E.D.) is available for companies, research institutions, and any other researchers in Massachusetts to search, find, and utilize MLSC-funded equipment. Examples of core facilities funded by our Research Infrastructure program are listed below, and all the instrumentation listed can be found on R.E.D.

MassNano Nanoparticle Characterization Facility, Beth Israel Deaconess Medical Center (Booth 16)

- **SPARTA Biodiscovery AGIS-1:** Label-free single particle optical tweezer trapping with Raman Spectroscopy analysis for chemical composition and dynamic reaction monitoring. Allows for chemical formulations of LNPs for production.
- **Unchained Labs Leprechaun and Stunner:** Leprechaun-Interferometer and immunofluorescence for titer, structure, RNA content, and contaminant analysis of Lentivirus, viral vectors, and exosomes. Stunner-UV/Vis and dynamic light scattering for LNP sizing and polydispersity, concentration, aggregation, and RNA quantification. Nanovesicle protein quantification and conjugate characterization. Viral vector capsid titers and content ratios.
- **ONi Aploscope:** Super resolution SMLM with 15 nm resolution. Capable of single molecule tracking, live cell imaging, protein interactions, and dSTORM/PALM. Includes the APLOFLOW, an automated fluidics system and sample preparation.
- **Spectradyne ARC:** Microfluidic pulse sensing in a non-optical fluorescent array. Size and concentration via non-laser driven pulse resistance voltage measurements.

Brigham Research Imaging Core (BRIC): MAGNUS, Brigham and Women's Hospital (Booth 20)

- **GE High-performance 3T MRI scanner:** for human neuroimaging research with very high gradient strengths ideal for diffusion imaging and the study of brain microarchitecture.

Cryo-Electron Microscopy Facility, UMass Chan Medical School (Booth 6)

- **ThermoFisher Titan Krios Cryo-Electron Microscope (300kV):** for high-resolution structure visualization, using single-particle electron cryo-microscopy and electron tomography.

Light Microscopy Core Facility, Brandeis University (Booth 2)

- **LifeCanvas Technologies SmartSPIM Light Sheet Microscope:** for the imaging of cleared tissues up to the size of a Rat brain. This is essential for large scale tissue imaging. Accessories include SmartBatch+ tissue clearing system.
- **Zeiss LSM980 Airyscan 2 Confocal Microscope:** super-resolution confocal with full incubation chamber for environmental control and 32 channel quasar detector for spectral unmixing.
- **Andor Dragonfly 620 Spinning Disk Microscope:** for single-molecule localization microscopy with 6 laser lines as well as a digital micromirror for optogenetics and stimulation, an ablation laser for stimulation and axotomy and the Borealis TIRF module.

Mass Spectrometry Core Facility, UMass Amherst (Booth 7)

- **Bruker timsTOF fleX Mass Spectrometer:** for proteomics, metabolomics and MS imaging/molecular histology. Equipped with nanoLC, UHPLC, MALDI and data analysis software.