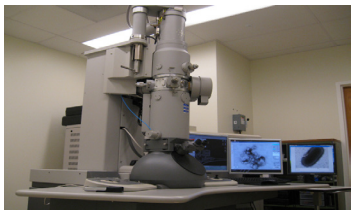
ELECTRON MICROSCOPY CORE IMAGING FACILITY

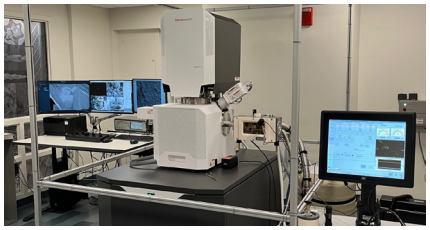
Center for Innovative Biomedical Resources (CIBR)

INSTRUMENTATION

Transmission Electron Microscope Thermo Fisher (FEI) Tecnai T12 TEM is used for imaging nanoparticles, exosomes, cell culture and tissue resin-sections at room temperature with an AMT camera.



Scanning Electron Microscopes Thermo Fisher Apreo 2 S Volumescope 2 is used for imaging surfaces (biological or materials), large-area SEM, volume EM and cryoSEM. This microscope has several detectors to choose from for imaging: ETD, TI, T2 (In-lens detectors), LVD, STEM.



The Volumescope 2 allows for resin sectioning with a diamond knife in the vacuum chamber. A session of slice and image will create a stack of images that can be rendered into a 3D reconstruction of the object using the AMIRA software package.

A Quorum PP301OT cryo system allows for plunge freezing samples, freeze fracture and coating and images of beam sensivite samples: i.e. hydrogels.

Thermo Fisher (FEI) Quanta 200 SEM is used for imaging the surfaces of nanoparticles, cell cultures, tissues and materials samples. It operates in three different vacuum modes to accommodate a wide range of sample types: High vacuum (HV), Low Vacuum (LV) and Environmental Mode (ESEM).

Image Analysis Computer Work Station HP Z8 Tower G5 computer with memory and high-powered graphics card to run AMIRA 2024.1 software for image analysis. Image stacks from various microscopes can be aligned, segmented and reconstructed using this powerful software/computer combination.

MISSION

The Electron Microscopy Core Imaging Facility on the University of Maryland Baltimore downtown campus provides electron microscopy services such as experimental consultation, sample preparation and imaging to researchers from the University of Maryland campuses and regional academic and industry partners. We offer TEM and SEM training and imaging services along with sample processing equipment and assistance. Our highly skilled staff will work closely with you to plan and execute your research project.

CORE SERVICES

- Conventional TEM sample preparation (fixation through ultrathin sectioning and post-staining)
- Conventional SEM sample preparation (fixation, critical point drying and sputter coating)
- High-Resolution SEM, Large area SEM, Volume SEM (3D)
- Electron microscope imaging services and training
- Immunogold labeling methods for protein localization
- Negative staining of exosomes, liposomes, bacteria, viruses, macromolecular complexes, nanoparticles and virus like particles (VLP)
- CryoSEM
- CLEM – Correlative Light and Electron Microscopy
- Project consultation
- Training and use of EM related instrumentation and protocols

Additional Instrumentation

- Keyence – All-in-one Fluorescence Microscope
- Sputter Coater
- Critical Point Dryer
- Automated Specimen Processor - ASP01000
- Ultramicrotome
- High Pressure Freezer
- Automated Freeze Substitution Unit
- Plunge Freezer
- Cryo-ultramicrotom

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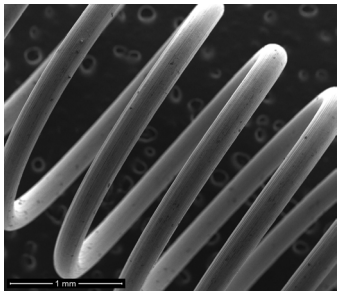
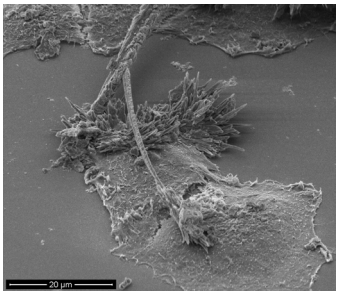
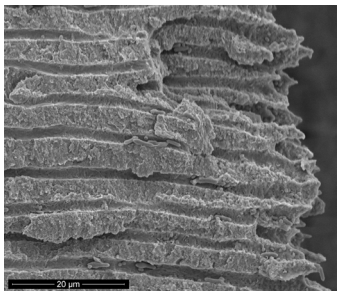


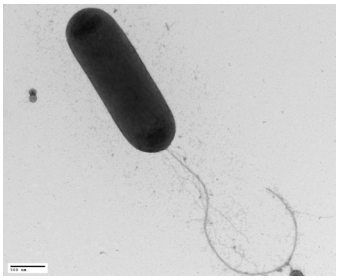
Cigarette Heating Coil

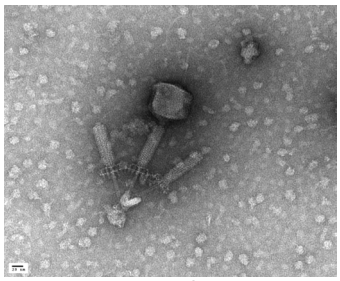


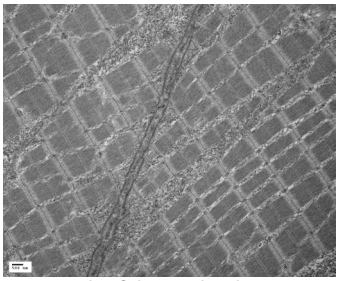
Chemically Induced HeLa Cells



Tooth Apical Dentin
Tubule with Bacteria


Bacteria with Flagella


Bacteriophage


Zebrafish Muscle Fibers

References

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