



Facilities and Resources

Fields Relevant for the Robert P. Apkarian Integrated Electron Microscopy Core

Located at two sites at Emory University's main campus, the Robert P. Apkarian Integrated Electron Microscopy Core (IEMC) provides services and training on conventional transmission electron microscopy (TEM), cryo-transmission electron microscopy (Cryo-TEM), single particle cryo-electron microscopy (SP-Cryo-EM), cryo-electron tomography (Cryo-ET), conventional scanning electron microscopy (SEM), Focused Ion Beam – Scanning Electron Microscopy (FIB-SEM) and cryo-high resolution scanning electron microscopy (Cryo-HRSEM). The IEMC supports academic, clinical, and industry users. Its focus and technical expertise aim to generate structural data from biological and non-biological specimens to support research in basic, biomedical, and material sciences and engineering.

The facility has recently incorporated micro-electron diffraction (micro-ED), cryo correlated light and electron microscopy (cryo-CLEM), and cryo electron microscopy of vitrified sections (CEMOVIS). Additionally, the acquisition of a Gatan K2 direct electron detector complements the existing DE20 direct electron detector for our cryo-EM and cryo-ET applications. The IEMC is supported by a qualified, supportive staff who not only contribute to research with their expertise but also with their commitment to training investigators (students, technicians and postdocs) on the various EM workflows. Users can utilize IEMC services autonomously or request IEMC staff to either assist or carry out entire workflows for them.

The IEMC – Biochemistry Connector Site (Rollins Research Center) hosts a state-of-the-art Talos Arctica (200 kV) microscope for high-throughput acquisition of high-resolution SP-Cryo-EM data, equipped with a Gatan K3 direct electron detector and a Gatan Image Filter (GIF). Using the Serial EM acquisition software, IEMC users can also acquire cryo-ET data. For TEM and cryo-TEM sample imaging and screening, users have access to the Talos L120C (120 kV) instrument. In addition, this site includes a wet-lab space for room temperature sample preparation and a dedicated cryo-EM sample preparation area with a Gatan CP3 and a Vitrobot Mark IV plunge freezers.

The IEMC –Emerson Site (ground floor of Cherry Logan Emerson Hall) includes dedicated wet-lab space for TEM preparation and processing, and immunocytochemistry. It hosts a Hitachi HT7700 (120 kV) for TEM, a JEOL JEM1400 (120 kV) for TEM, tomography of sectioned materials, and cryo-TEM, and a JEOL JEM2200FS (200kV) equipped with direct electron detectors for SP-Cryo-EM, Cryo-ET, and micro-ED. The IEMC is also equipped with a JEOL JSM-IT700HR SEM capable of imaging and elemental analysis by Energy Dispersive Spectroscopy (EDS). Users also have access to a Vitrobot Mark IV for preparation of cryo samples, microtomes and cryo-ultramicrotomes for semithin and ultrathin microtomy, high pressure freezing and cryo-substitution equipment for CEMOVIS or sample embedding, and sputter coaters for ultrathin metal film coating for room temperature and cryo-preserved specimens. A Helios 5 Hydra FIB-SEM integrated with a Delmic Meteor Fluorescence Microscope (iFLM) is available to IEMC users in the Fall 2024.

The IEMC provides access to computing equipment with the latest software for structural data processing maintained through an SB Grid Consortium subscription. Our staff also offers support for image analysis and processing for grants and publications.