

Transmission Electron Microscopy at the Donald Danforth Plant Science Center

Specimen prep: state-of-the-art fixation by ultra-rapid freezing using a Bal-Tec High Pressure Freezing Machine (Model HPM 010). Samples are frozen in 6-10 milliseconds, giving rapid fixation without ice crystal formation. Water is removed by freeze substitution, using precise temperature programming provided by our Leica AFS2 freeze substitution machine. Resin-embedded samples are thin sectioned using our Leica Ultracut microtome.

Sections are imaged using our Leo 912 AB energy filter transmission electron microscope. The instrument is operated at 120 kV, has a LaB6 filament, and images are captured on a Proscan 2, 2k x 2k CCD camera. The energy filter is an in-column omega filter that is routinely used for zero-loss imaging (i.e., boosts contrast in conventional images) and also for elemental analysis by electron energy loss spectroscopy (EELS).