

Dissemination Of Cryoem Best Practices by Training with Modular Units Called “Merit Badges”

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The National Center for CryoEM Access and Training (NCCAT) is part of the NIH sponsored Transformative High Resolution Cryo-Electron Microscopy program with a mission to increase access to cryoEM technologies for labs without prior expertise. Towards this aim, we invest significant effort in training activities at multiple scales. Many practical hands-on skills needed to perform a successful cryoEM experiment can be broken down into discrete steps that comprise a foundational workflow for preparing microscope-ready specimens. Our training includes independence certifications for the instruments used in these steps that we recognized could be put into a framework similar to scouting badges. We developed a training tool called “Merit Badges” that formalizes a modular training strategy and leverages the many resources that are part of the Transformative High-Resolution Cryo-electron Microscopy Program. Namely, inclusion of material from open-source curricula allows users to prepare for training even before arrival on site at a national center. Further, collaboration between the multiple centers in the program fosters a community-wide consensus of best practices and cross-verifiable standard of training. NCCAT has awarded over 20 badges covering the full set of skills required to prepare a cryoEM specimen and insert it into a microscope for imaging. Future badges will include microscope operation skills with the priority of development to be influenced by the needs of the community.