

The National Center for CryoEM Access and Training: Utilizing CryoEM Merit Badges to Accelerate Access to CryoEM Technology

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Advances in cryogenic electron microscopy (cryoEM) technology have made it possible for biomedical researchers to obtain detailed images and structures of many macromolecular complexes that cannot be achieved using other methods. CryoEM instrumentation is being installed in many research institutions and there is a need to learn the best practices available in the field. The National Center for CryoEM Access and Training (NCCAT) is an NIH-sponsored service center based in New York that provides scientists with access to state-of-the-art cryoEM technology and training, from sample preparation to the collection of high-resolution data and computational analysis. This facility allows for the use of state-of-the-art equipment for the collection and analysis of high-resolution data, while also providing technical support and cross-training to establish a community of independent users of cryoEM technology across the nation. These services are offered at no cost to non-profit institutions, thus eliminating the high-cost barrier usually associated with cryoEM and structural biology in general. An important component of NCCAT's mission is to increase hands-on training and the availability of instructional material on cryoEM methodology. NCCAT has been working with partner service centers to develop open-access instructional material called "cryoEM merit badges" to expand standards and training efforts. CryoEM merit badges are proficiency badges awarded to users of any of the centers in three main skill areas: 1) sample preparation, 2) microscope operations, and 3) data processing. A merit badge certifies a researcher as independent on a particular instrument or in a skill area. Merit badges are cross-honored at other US national service centers, minimizing duplication of training efforts and ensuring a minimal level of core competency is attained by practitioners. Taken together we aim to lower the barriers of access and cross-train biomedical researchers to broadly utilize cryoEM techniques.