Enabling access to cryoEM technologies by novice practitioners through access and training at multiple scales

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Cryo-electron microscopy (cryoEM) is a decades old structural biology technique, but technology advancements have recently led to the ability to determine near-atomic resolution structures of biomolecules. This has expanded the utility of cryoEM for samples not amenable to other high-resolution techniques and increased interest in the field. Continued technology development has made cryoEM more accessible to non-experts and instrumentation is being installed in research institutions at a rapid pace, resulting in demand for training in 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 City with a mission to lower barriers of access to cryoEM by providing access to state-of-the-art cryoEM technology and training. Our instrumentation access includes sample preparation on a chameleon or plunge freezer, screening on a TFS-Glacios transmission electron microscope, and data collection on TFS Titan Krios TEMs. In-person access sessions also involve training because there is close interaction between users and center staff scientists. Our formal training efforts are guided by a desire to disseminate current best practices without hindering flexibility or creativity as most steps of a cryoEM workflow are adaptable depending on the use case. CryoEM encompasses a wide range of experimental systems including single particle analysis, in situ cryo-electron tomography, and electron diffraction techniques and researchers can be practitioners at varied levels, making one-size-fits-all training inadequate for a broader reach. To address these needs, our training programs span multiple formats including large webinars, small workshops, and one-on-one immersive training. Here we will present an overview of how we currently implement access and training to meet our mission.