

OPENING NEW FRONTIERS IN CRYO-ELECTRON MICROSCOPY

Problem – Challenge

Cryo-electron microscopy (EM) is an extremely powerful experimental technique to study the atomic structure of biological systems, materials and nano-structures and has led to fundamental breakthroughs in the life- and material sciences, culminating in the chemistry Nobel prize 2017. State-of-the-art equipment for cryo-EM users that require even lower temperatures close to the absolute zero point (-273°C), can stabilize the thermal conditions only for very limited time (~ 15 min). Because of this short time window, effective research is greatly inhibited as experiments are terminated prematurely. Moreover, cool-down cycles per sample are very lengthy (~ 2 hrs) during which the microscope is blocked and unused, adding up unnecessary costs (~ 400 \$/hrs) over time. With a recent patented invention, we have the technology to overcome all these limitations and revolutionize the market for cryo-microscopy.

Solution

Our new cryo-invention provides us with the technology to manufacture a cryo-sample holder that solves all existing limitations. We have developed a novel cryogenic cooling principle that enables rapid cool-down cycles (~ 10 min) and maintains the cryogenic state for over 24 hrs. This new solution is enabled by additive manufacturing technology and advances in material science. The longer experimental time window that our solution provides paves the way for new and effective research possibilities in the life- and physical sciences. With our cryo-holder of electron microscopes entirely new experiments and fields open up to our customers.

