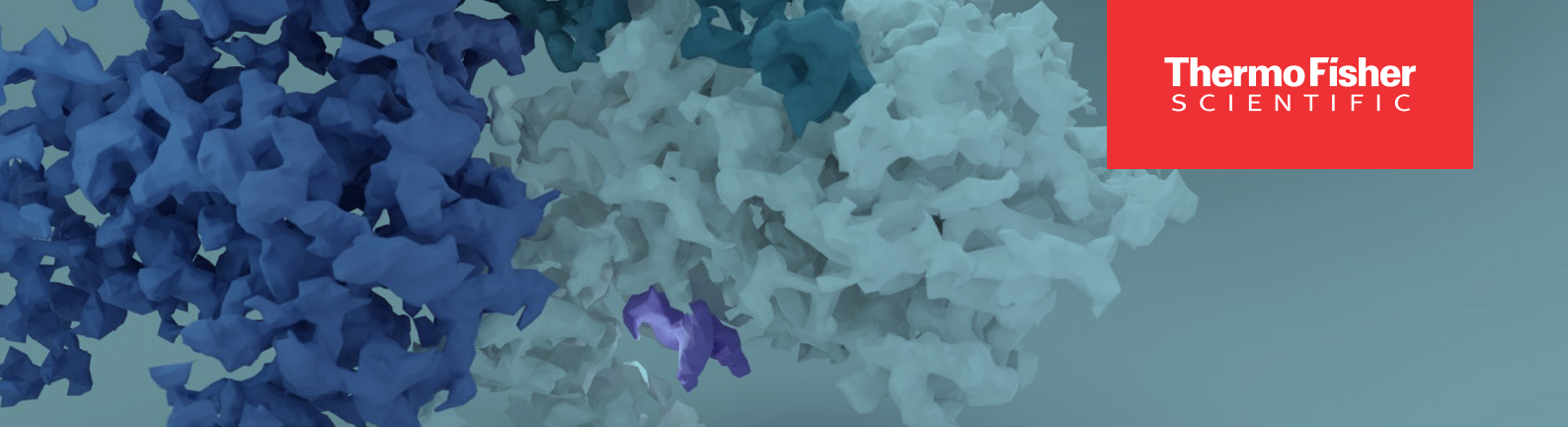


Glacios 2 Cryo-TEM and the Evolution of 200 kV Cryo-EM

As cryo-electron microscopy continues to advance, the latest instruments are making it possible to do more with less. The 200 kV instruments that were once seen as screening tools for higher-resolution 300 kV instruments are now delivering better and better results.

The Thermo Scientific™ Glacios™ 2 Cryo-TEM delivered impressive results after it was announced in 2022. And when paired with a new low-energy-spread cold field emission gun (E-CFEG) in March 2024, it delivered world-record-breaking resolution of 1.5 Å for apoferritin at 200 kV.

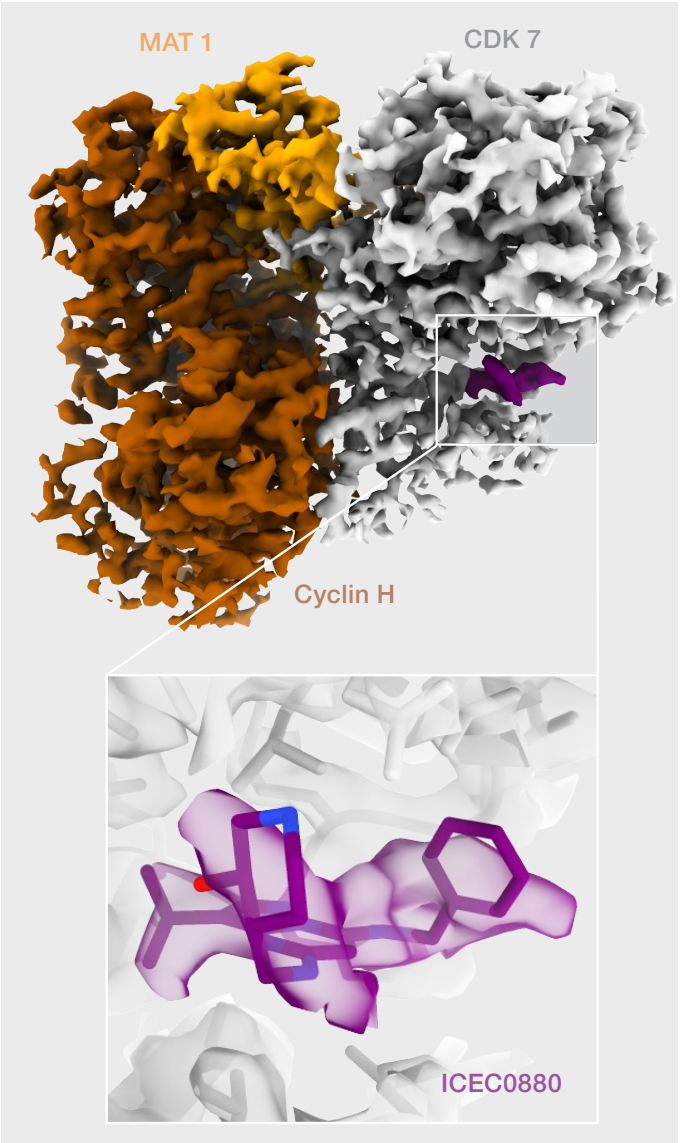
The Glacios 2 Cryo-TEM offers many advancements that make this high-quality analysis possible at a lower operating voltage:

- Its Thermo Scientific™ Falcon 4i Direct Electron Detector captures both small and flexible proteins as well as larger structures using fewer images
- When coupled with a Thermo Scientific™ Selectris™ or Selectris X Energy Filter, it produces high-contrast TEM data for higher throughput and higher resolution structures
- The E-CFEG option provides higher-contrast images and higher resolution
- Thermo Scientific Smart EPU Software allows you to collect thousands of images with minimal user input and produces more accurate, usable data with each scan

Powerful results captured with 200 kV cryo-TEM

Drug discovery

In March 2024, Professor Basil Greber of the Institute of Cancer Research, London, published a paper in *Nature Communications* demonstrating how the Glacios 2 Cryo-TEM was used to determine the structure of a CDK-activating kinase. These enzymes are involved in cell regulation and are actively being investigated as potential targets for cancer treatments.

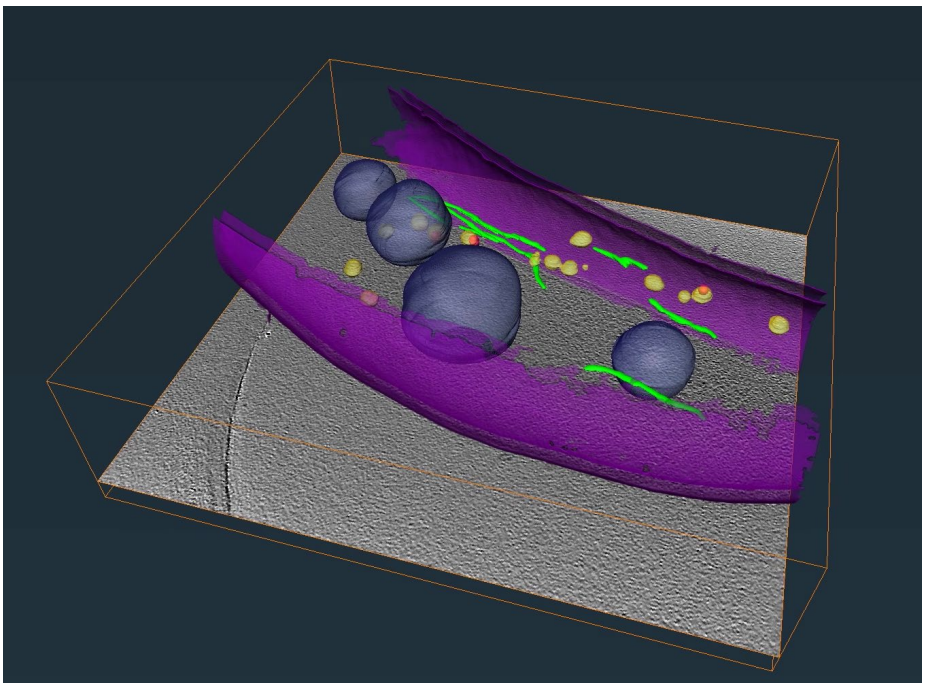


CDK-activating kinase complex structures solved on a Glacios 2 Cryo-TEM.

thermo scientific

Cryo-electron tomography

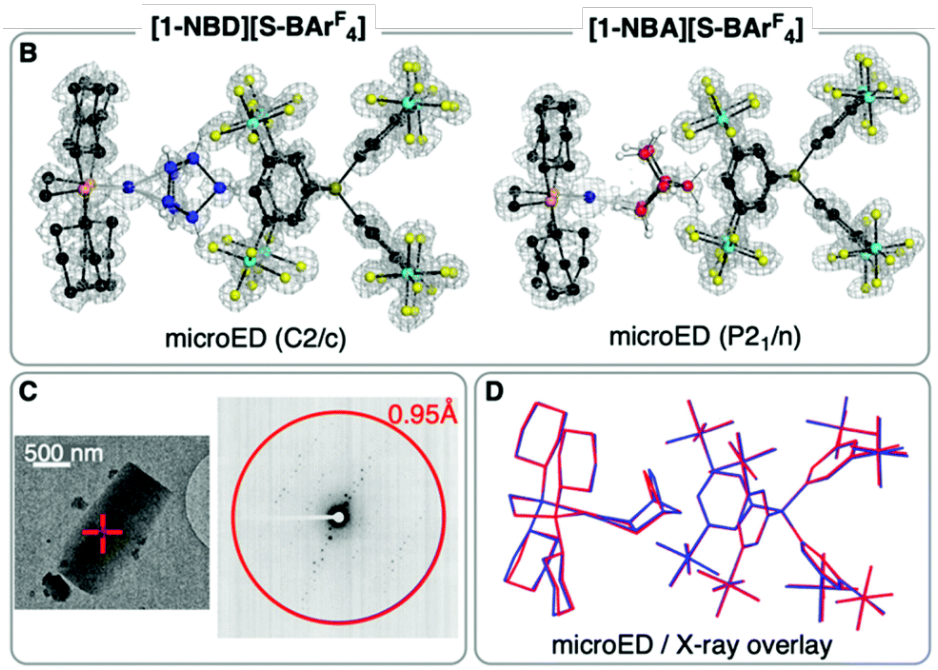
The Glacios 2 Cryo-TEM can be used to obtain tomography data from whole bacterial cells or lamellae prepared with Thermo Scientific™ Aquilos™ or Arctis™ Cryo-Focused Ion Beams. In the Magnetospirillum example shown here, membranous compartments, filaments, and larger proteins can clearly be visualized within the 300 nm thick plunge-frozen bacterial cell.



3D visualization of the cell membrane, liposomes, and filaments in a Magnetospirillum bacterium, generated using 200 kV Glacios 2 Cryo-TEM data. Image courtesy of Dirk Schüler, University of Bayreuth.

Microcrystal electron diffraction

A team from the University of York performed single crystal to single crystal transformations on grid to generate and characterize organometallic species that were otherwise highly reactive. By using 200 kV cryo-TEM for MicroED analysis, they were able to resolve the crystallographic structures down to 0.95 Å resolution.



Comparison of MicroED data collected from nanocrystals (C) with traditional X-ray diffraction results obtained from larger crystals, which were much more difficult to obtain. Reproduced from the corresponding article by LR Doyle et al under CC BY 3.0.

The future of 200 kV cryo-EM

Cryo-EM software and hardware continue to improve at an astonishing pace, painting a bright future for the technique. Notably, cutting-edge data processing, along with AI-driven modeling of cryo-EM data, is showing incredible potential for taking us from sample to structure faster than ever before.

Scan to read more about 200 kV cryo-EM

Learn more at **thermofisher.com/Glacios2**