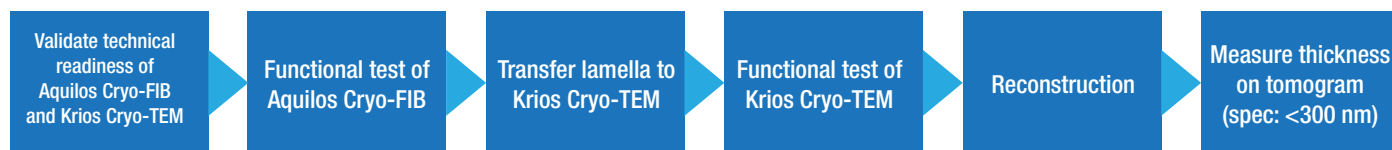# Workflow Validation for Cryo-Tomography

Accelerate your scientific research

A successful cryo-tomography workflow requires precise multi-step coordination across the Thermo Scientific™ Aquilos™ Cryo-FIB and Titan™ Krios™ Cryo-TEM. If just one element of the workflow is not optimized, then a quality tomogram will not be possible. This could set your facility back on critical research.

Our cryo-tomography workflow validation service demonstrates that the Aquilos Cryo-FIB and Krios Cryo-TEM are ready for your biological cryo-electron tomography (CET) applications. By validating your multi-step workflow, you can be confident that you will produce lamellae of the proper quality and thickness.

Using our workflow validation service, you will be assured that all necessary functions of the cryo tomo workflow can be properly executed. A proven lamella thickness <300nm, measured on the tomogram, shows that there a no structural issues that could impact the quality of the tomogram. And, if any step is not successful, our team will find resolve the root cause or enable you to resolve it.

Our service packages include many additional elements to optimize your Thermo Scientific cryo-tomography workflow. Learn more at thermofisher.com/emserviceandsupport

| Validate technical readiness of Aquilos Cryo-FIB and Krios Cryo-TEM | → | Functional test of Aquilos Cryo-FIB | → | Transfer lamella to Krios Cryo-TEM | → | Functional test of Krios Cryo-TEM | → | Reconstruction | → | Measure thickness on tomogram (spec: <300 nm) |

Thermo Fisher Scientific is the only supplier that validates a successful execution of the cryo-tomography workflow.

ThermoFisher
SCIENTIFIC

The cryo-tomography workflow validation steps include:

- Validate technical readiness of Aquilos Cryo-FIB and Krios Cryo-TEM
  - Update application and server software to latest versions
  - Perform cryo-tomography-specific and relevant alignments and calibrations
  - Check consumables and replace if required
  - Verify systems are functioning according to SAT specification
  - Verify contamination rate in Aquilos Cryo-FIB (SAT)
  - Perform sputtering test
  - Perform GIS Pt deposition test
- Functional test of Aquilos Cryo-FIB
  - Use a vitrified biological specimen (yeast cells clipped in cryo-FIB autogrids)
  - Produce multiple lamellae in Aquilos Cryo-FIB
- Transfer lamella to Krios Cryo-TEM
- Functional test of Krios Cryo-TEM
  - Verify lamellae are present and suitable for image acquisition
  - Acquire a tilt series using at least one lamella with Thermo Fisher Scientific Tomography software

- Reconstruction
  - Software reconstruction using Thermo Fisher Inspect 3D software
  - Use Thermo Scientific Amira™ Software to visualize tomogram in 3D
  - Measure the thickness of the lamella from the 3D reconstructed volume
- Specification: <300 nm
- If any step is unsuccessful, we will resolve the root cause of the failure.

A successfully produced tomogram of an in-spec lamella proves that:
- Lamella can be created in the Aquilos Cryo-FIB
- Lamella can be transferred from the Aquilos Cryo-FIB to the Krios Cryo-TEM
- A tilt series can be acquired
- The acquired tilt series can be reconstructed
- Lamella thickness is measured from the 3D reconstruction to be less than 300nm
- There are no issues that fundamentally block the cryo-tomography workflow at your site

Find out more at **thermofisher.com/emserviceandsupport**