

# Unlocking the power of cryoelectron tomography through the MIMAS workflow

×

## Revealing ultrastructural details in biological specimens by plasma FIB/SEM imaging

### Joint seminar by:

Dr. Katherine Lau

VP Business Development for Life Sciences, Delmic

Dr. Kathrin Rudolph

Life Science Product Specialist, Tescan

Date: Tuesday, October 7<sup>th</sup> 2025

Time: 14:00 - 15:15

Venue: Seminar room L4E01



## Abstract

### Part 1. Unlocking the power of cryoelectron tomography through the MIMAS workflow: next-generation high throughput, accuracy and quality cryo-lamellae preparation

Cryoelectron tomography (cryo-ET) can provide nanoscale insights into protein complex structures and the interactions with their surroundings inside the cell/tissue. To acquire tomograms, the sample has to be made into 'lamellae', which are sections thin enough for transmission electron microscopy (TEM). This process faces myriad challenges such as ice contamination, targeting the region of interest (ROI) in the lamella, lamella throughput and quality. Delmic has partnered with TESCAN to develop the MIMAS workflow to overcome the abovementioned challenges. Through integrating advanced fluorescence microscopy (FM) technologies with TESCAN SOLARIS X 2 and automation, we increase lamella target accuracy, throughput and quality. Combining advanced FM technique such as confocal and tricoincident imaging, we ensure high sample versatility and capture even the rare ROIs. In this presentation, we explain how MIMAS workflow technologies advance cryo-ET by accompanying the technical explanations with application data, e.g. tomograms from cyanobacteria, NLRP3-inflammasome activation, virions in host cells, and METEOR (integrated FM)-guided serial lift-out experiments from a high pressure frozen *C. elegans* larva.

### Part 2. Revealing ultrastructural details in biological specimens by plasma FIB/SEM imaging

FIB/SEM serial imaging is a powerful technique for revealing the ultrastructures of biological samples in three dimensions and at high resolutions in X, Y and Z. Recently, TESCAN has released its Mistral plasma FIB, available on the SOLARIS X 2, to increase the speed of slicing. Combined with the Triglav UHR-SEM, high resolution and contrast vEM can be achieved from resin embedded samples at room temperature and unstained cryo specimens. In this presentation you can learn about examples of FIB/SEM imaging from brain tissues, how the Expert Tomography module allows users to set up FIB/SEM imaging experiments effortlessly by following a step-by-step guide, and how TESCAN 3D viewer enables users to post process the data intuitively with its built-in tools, and how the 3D architectural details come alive in the 3D viewer.

Hosted by the Marine Structural Biology Unit  
Oleg Sitsel