specification sheet | meteor

METEOR specifications sheet

Reduce transfer steps and improve sample yield with integrated cryo-CLEM

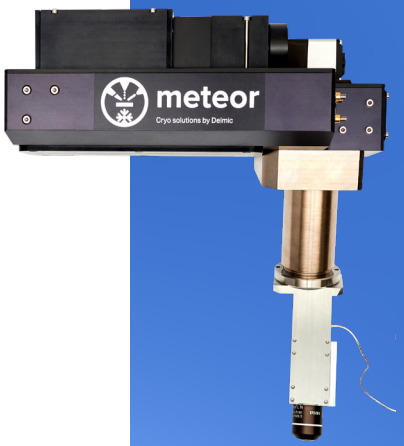
delmic

Introduction

METEOR is a top down cryo-CLEM imaging system that is easily retrofitted to your cryo focused ion beam (FIB)/ scanning electron microscope (SEM) system. It's designed to overcome the challenges in the current cryogenic electron tomography (cryo-ET) workflow by providing the capability to perform in situ fluorescence light microscopy (FLM) in your cryo FIB/ SEM chamber.

Not only does it reduce the number of transfer steps between microscopes, protecting the fragile sample from unnecessary contamination, it will also allow you to confirm the presence of the region of interest (ROI) in the lamella directly after FIB milling. METEOR is highly adaptable to your current workflow and works well with your transfer systems and sample holders, making it easy to adopt.

What will you achieve with METEOR?



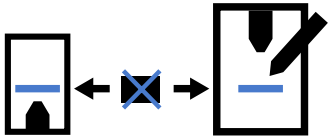
METEOR can ensure an efficient lamella preparation workflow and increase sample yield for downstream acquisition of high resolution three dimensional EM data, which helps reveal the biological structures in their near-native cellular environment.

Through fluorescence aided cryo electron tomography, METEOR will help you to unravel molecular functions, structure and interaction more easily. It will help reveal the connections between different organelles and intracellular molecules. It's a poweful tool that can be applied to a wide range of research areas including microbiology, neurosciences, immunology, virology, developmental, cell and molecular biology.

Key benefits

Increase sample yield

Target your ROIs and correlate better and more effectively with the integrated FLM. Reduce transfer steps and thereby sample damage.

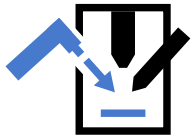


Optimize your workflow

Save time and work more efficiently by having both FLM and FIB in the same microscope.

Boost productivity

Produce high quality lamellae more easily. Obtain insight into your biological system through getting useful tomography data more quickly.

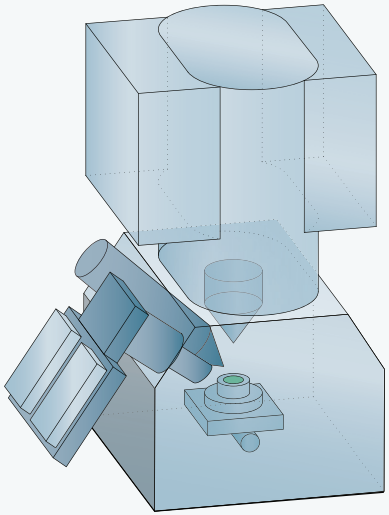


Improve cost efficiencies

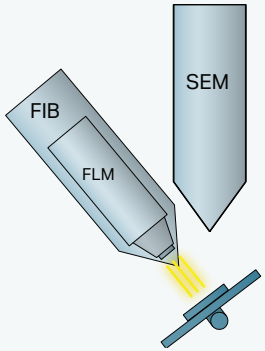
Use your cryo TEM time more effectively on useful lamellae. Remove the need for a separate cryo FLM dedicated solely to ROI finding.

Workflow at glance

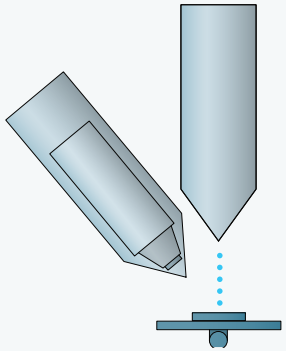
1. Load sample in cryo-FIB/SEM/FLM



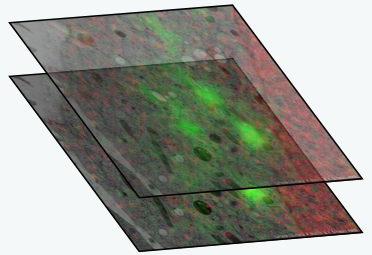
2. Move to FLM position and capture FLM image



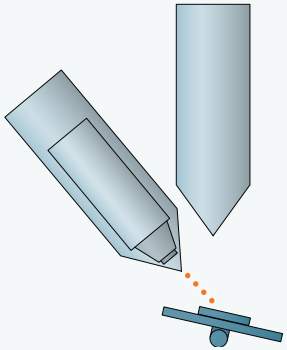
3. Move to SEM position and capture SEM image



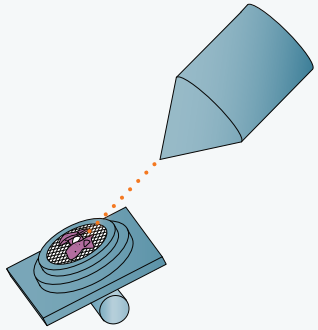
4. Image correlation



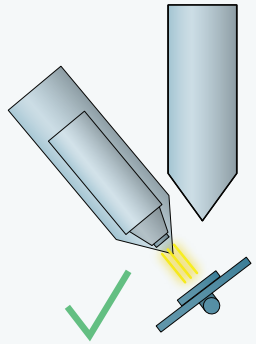
5. Move to a region of interest (ROI) based on the FLM image



6. FIB mill lamella



7. After milling: check if fluorescence (from ROI) is still present



System specifications

Optics

Objectives: the following options are available*

- Olympus Fluorite objective
  - 10x (WD 11.0 mm, NA 0.30)
  - 20x (WD 3.1 mm, NA 0.45)
  - 50x (WD 1.0 mm, NA 0.80)
  - 100x (WD 1.0 mm, NA 0.90)
- Olympus Apochromat objective
  - 50x (WD 0.35 mm, NA 0.95)
  - 100x (WD 0.35 mm, NA 0.95)
- Olympus Semi-Apochromat objective
  - 50x (WD 10.6, NA 0.5)

* Depending on shuttle and sample stage configuration the choice of objectives can be limited due to space restrictions.

Lightsource:

Omicron LedHub fitted with 4 LED sources:

- 385 nm
- 470 nm
- 505 - 600 nm - bandpass filter
- 625 nm

Camera:

1.31 MPix 10bit CMOS camera (UI-5240SE Rev. 4)

Filters:

Equipped with filter wheel (filters can be optimised according to user's needs):

- 440/40 nm single-band bandpass filter
- 525/30 nm single-band bandpass filter
- 607/36 nm single-band bandpass filter
- 684/24 nm single-band bandpass filter
- 410/504/582/669 nm dichroic beamsplitter

System Control

Comes with a control PC for acquiring your fluorescence images

Odemis Integrated Software

ODEMIS, a user-friendly open-source acquisition software, is installed together with METEOR. It will ensure image acquisition parameters are primed for high quality fluorescence images. Users can furthermore implement their own scripts in Python to automate routine processes, e.g. camera exposure time optimisation.

Contact information

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