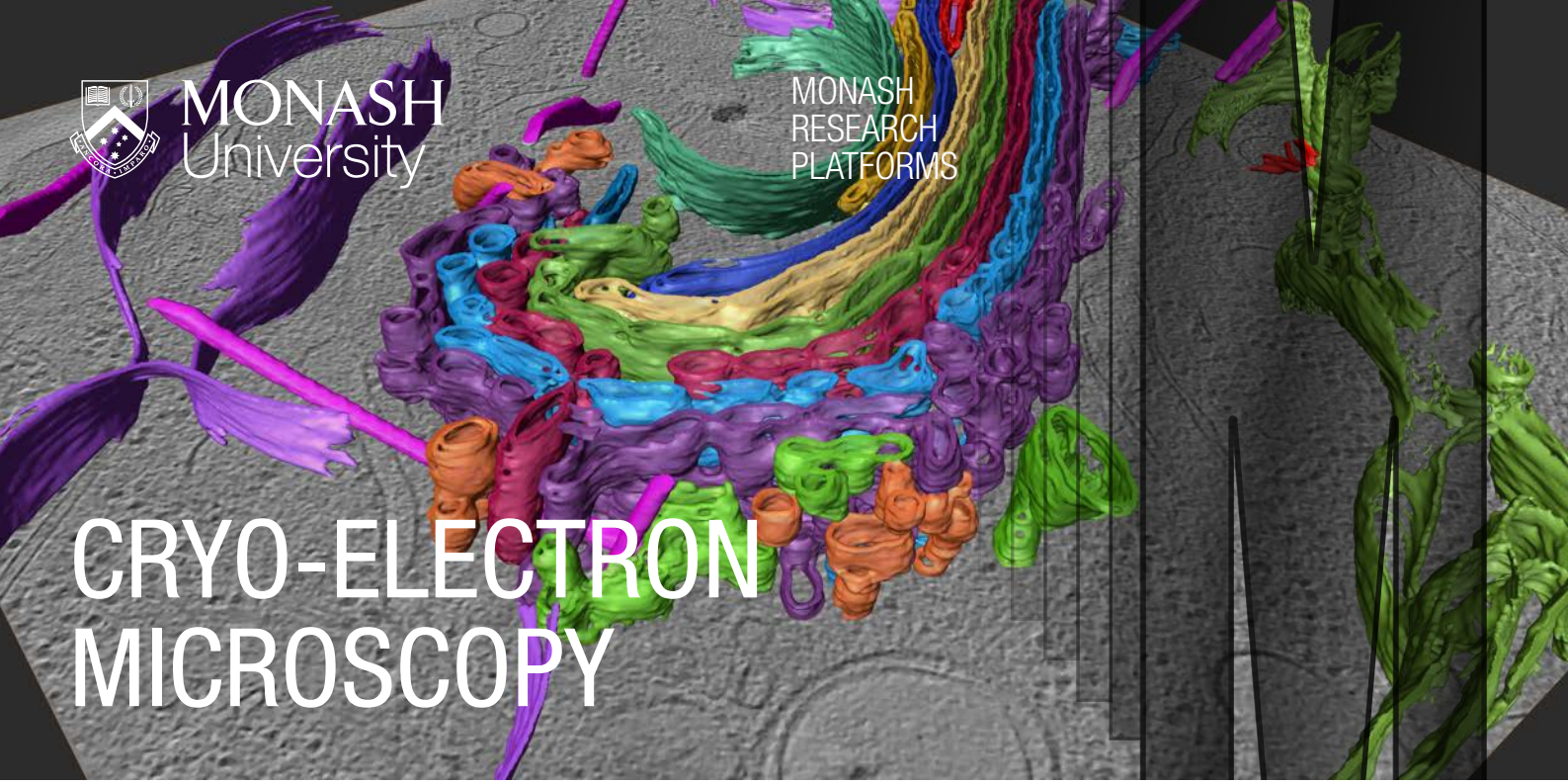

MONASH University

MONASH RESEARCH PLATFORMS

CRYO-ELECTRON MICROSCOPY

The Monash Ramaciotti Centre for Cryo-Electron Microscopy (Cryo-EM) is a leading research facility for biological electron microscopy.

Our platform provides expertise in advanced electron microscopy for biomedical discoveries at the molecular and cellular levels. We offer a range of techniques including Volume EM, immuno-electron microscopy, correlative light and electron microscopy, cryo-electron tomography, and protein structure determination using single-particle analysis and sub-tomography averaging.

We maintain a suite of advanced electron microscopes, including two Titan KRIOS Cryo-TEMs.

SPECIALIST SERVICES

- Single-particle Cryo-EM
- Cryo-Tomography
- Cryo-FIBSEM
- Immuno-electron microscopy
- Scanning electron microscopy
- Correlative light and electron microscopy
- Transmission electron microscopy
- Volume EM
- AI-based image anlaysis

EXPERTISE

Our platform supports Australian researchers by developing and applying advanced imaging techniques to study the life sciences. We conduct research into advanced life sciences EM techniques.

Our team also provides training and expertise to Australian and international collaborators on advanced EM projects.

WORKING WITH US

- Fee for facility access
- Collaborative research
- Training
- Contact us to discuss your project and how we can best help you

KEY INSTRUMENTATION

Transmission electron microscopes (TEM)

Our platform houses five TEMs, including two TFS Titan KRIOS 300kV cryo-TEMs designed for automatic data collection. KRIOS 1 is equipped with a Falcon 3 direct electron detector as well as a Gatan energy filter with a K3 direct electron detector. KRIOS 2, our newest microscope, includes a C-FEG and is equipped with a Selectris X imaging filter, coupled with a Falcon 4i direct electron detector, as well as Panther and EMPAD detectors. Both KRIOS microscopes have a robotic autoloader capable of holding 12 EM grids under liquid nitrogen conditions. Software packages such as EPU for single-particle analysis and Tomography 5, are available for data collection, 3D visualisation, and analysis.

Our other TEMs include the TFS Talos Arctica, a 200 kV cryo-TEM dedicated to structural cryo-EM (equipped with a Gatan K2 camera and a Falcon 3 direct electron detector), the TFS Tecnai G2 Spirit, a 120 kV TEM used for cryo-applications and the JEOL JEM-1400Flash instrument for standard TEM.

Focused ion beam scanning electron microscope (FIBSEM)

Our platform houses Australia's first dedicated cryo-FIBSEM, a TFS Helios G5 UX with a Leica VCT500 cryo stage and auto refill system, which allows 24/7 operation. The Helios G5 UX was recently upgraded and is equipped with an Easylift NanoManipulator (for cryo lift-out), an Oxford EDS system and software for Slice & View, CLEM, TEM lamellae preparation, and 3D EDS analysis.

Scanning electron microscope (SEM)

The TFS Nova NanoSEM is capable of imaging life science structures in the nanometer range. It is equipped with secondary, backscatter, and STEM detectors, as well as a Leica VCT500 cryo stage. It also runs the MAPS software package.

Cryo-confocal microscope

The Zeiss LSM900 Airyscan 2 confocal microscope is equipped with a Linkam CMS 196 cryo stage. This microscope is dedicated to correlative light and electron microscopy.

Sample preparation suite

Our platform also has dedicated equipment to prepare proteins, viruses, bacteria, cells, tissues and small organisms for life sciences EM.

This includes dedicated cryopreservation and sample preparation equipment such as a TFS Vitrobot Mark IV freeze plunger, Wohlwend compact 3 high-pressure freezer, Leica UC7/FC7 cryo-ultramicrotomes and a Leica cryo high vacuum coating unit EM ACE600, which is equipped with freeze-fracture and freeze etching capabilities.

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