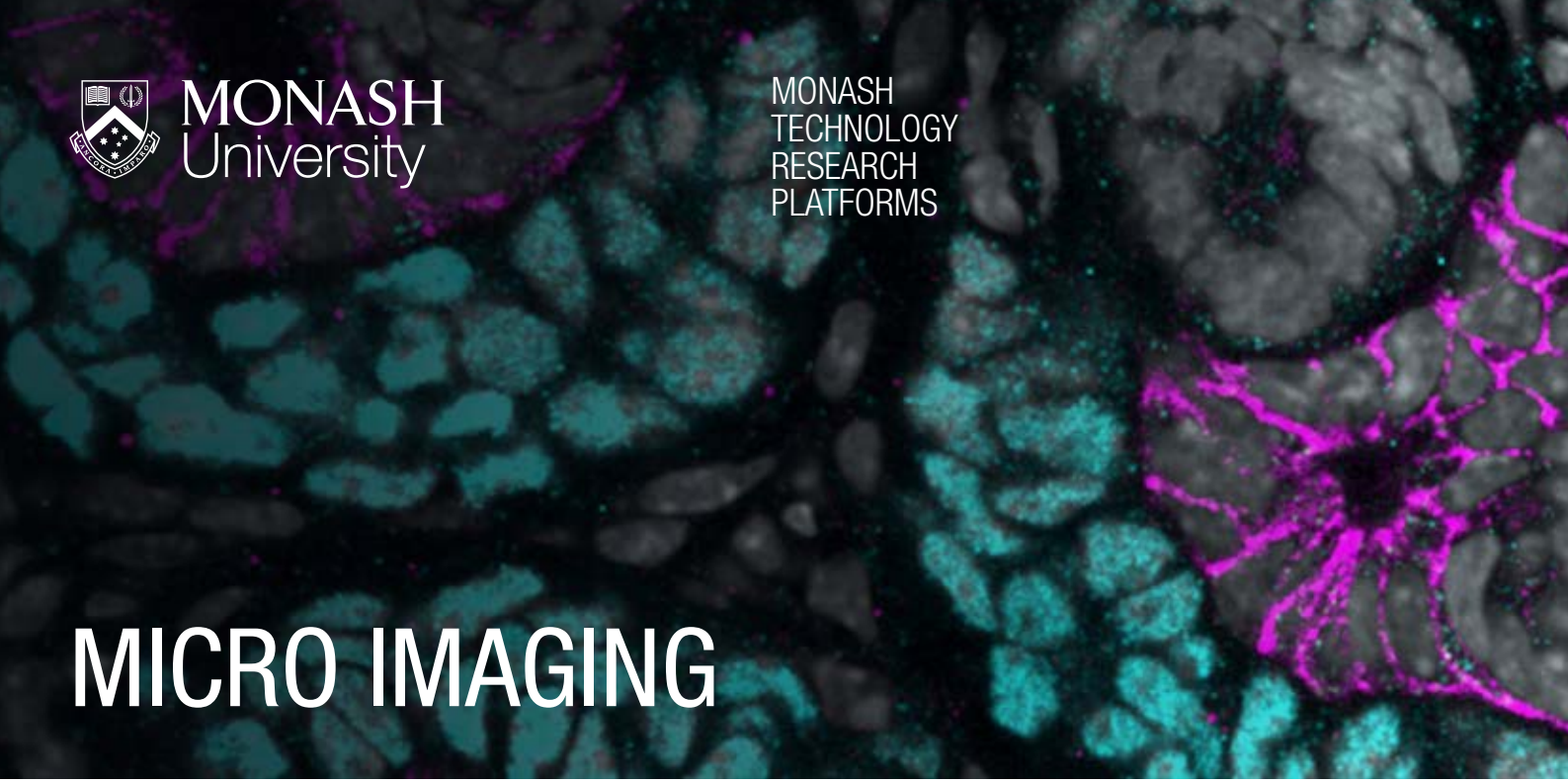
MONASH University

MONASH TECHNOLOGY RESEARCH PLATFORMS



MICRO IMAGING

Monash Micro Imaging (MMI) is world-class in optical imaging. We have core facilities at the Clayton campus and specialised nodes at the Monash Health Translation Precinct and the Alfred Medical Research and Education Precinct. MMI technologies include advanced light microscopy, fluorescence and confocal microscopy, multiphoton microscopy, super-resolution microscopy, light-sheet microscopy, which cater to a diverse range of morphological and functional characterisation in the life sciences. All technologies are underpinned by bioimage analysis and research training.

KEY INSTRUMENTATION

Our instrumentation is sourced from major innovative microscope companies, including Leica, Zeiss, Olympus, Nikon, Abberior, Lavision [bulllet] Biotec, and Intelligent Imaging Innovations (3i).

- Widefield fluorescence microscopy
- Polarisation microscopy
- Confocal microscopy
- Multiphoton microscopy
- Deconvolution microscopy
- Stereology (at MHTP)
- Super-resolution Microscopy: dSTORM, N-STORM/N-SIM, and STED
- Lightsheet microscopy including Lattice Lightsheet, OpenSPIM and Ultramicroscopy
- Dynamic Fluorescence analysis: FRAP, FLIM, FCS, photoactivation, ratiometric approaches
- Image analysis: ImageJ/FIJI, Metamorph, CellSens, LASAF, NIS elements, SymPhoTime (FLIM), Imaris Suite, Huygens Core/Professional, Drishti.

EXPERTISE

Our team provide expertise and training across a wide range of analytical microscopes and microscopy modalities in the biomedical and life sciences. Our services range in complexity from sample preparation and labelling for fluorescence analysis to performing live-cell experiments for cell signalling and organ/organism development. We provide guidance and training to allow scientists and students to undertake cutting edge analytical research with confidence.

Our platform works closely with other MTRPs, such as Histology, Cryo-EM and eResearch, to provide integrated microscopy support to a large research community.

WORKING WITH US

- Fee for access
- Training
- Collaborative research

SPECIALIST SERVICES

Our team provides advanced microscopy instrumentation and analytical techniques to a large research community. Ranging in complexity from the simple labelling and mounting of slides for immunofluorescence microscopy, to live imaging in multiwell plates or sophisticated perfusion chambers, we will guide and train you to perform experiments, produce high-quality images and extract analytical data.

Advanced light and fluorescence microscopy

Our instrumentation provides a solid platform of advanced light and fluorescence microscopy techniques, including automation, highspeed imaging, time-lapse, slide scanning (in conjunction with our Histology Platform) and image tiling, and live-cell imaging on slides, chambers or microplates. Both upright and inverted instruments are available, and all systems are supported by a comprehensive range of professional software for bioimage analysis to provide quantitative results.

Live-cell imaging is one of our specialities

Most of our instruments are equipped with live-cell incubators, specialised cell chambers or multiwell plates that support live and long term imaging experiments. We have extensive knowledge in experimental design, labelling and analysis.

Optical sectioning and 3D analysis

Our range of instrument modalities includes confocal (laser scanning and spinning disk) and multiphoton microscopes. For high-speed imaging, we have resonant scanning confocal and light-sheet microscopes. Imaging deeper into tissue can also be done by multiphoton imaging in live, fixed or cleared tissue microscopy which is capable of imaging to a depth of 2-6mm with specialised objectives.

Special methods and emerging technologies

Our expert staff offer extensive collaborative support for the more novel or complex instruments and applications, including Fluorescence Lifetime Imaging Microscopy (FLIM), Lattice Lightsheet Microscopy, single-molecule localisation microscopy (dSTORM, N-STORM), Stimulated Emission Depletion Microscopy (STED), Structured Illumination Microscopy (N-SIM), birefringence microscopy and, in conjunction with the Cryo-EM platform, correlative light and electron microscopy.

Image analytics and data handling

Extracting and understanding bioimaging data is crucial, and handling big datasets is often a bottleneck in research. Our bioimage analysis team is available to train scientists and students in the analytical software we licence (ImageJ/FIJI, Imaris, Huygens, Metamorph), and they are also able to develop workflows and new analytical methods. In conjunction with eResearch, we are also building data handling and analysis pipelines to facilitate the flow of (big)data from instrument to computational workspaces and ultimately to publication.

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