BIO-EM IMAGE ANALYSIS SPECIALIST

DEPARTMENT/UNIT	Monash Ramaciotti Centre for Cryo-Electron Microscopy
FACULTY/DIVISION	Medicine, Nursing and health Sciences
CLASSIFICATION	HEW Level 8
DESIGNATED CAMPUS OR LOCATION	Clayton campus

ORGANISATIONAL CONTEXT

Monash is a university of transformation, progress and optimism. Our people are our most valued asset, with our academics among the best in the world and our professional staff revolutionising the way we operate as an organisation. For more information about our University and our exciting future, please visit www.monash.edu

The Faculty of Medicine, Nursing and Health Sciences, is the largest faculty at Monash University, and offers the most comprehensive suite of professional health training in Victoria. We consistently rank in the top 40 universities worldwide for clinical, pre-clinical and health sciences.

We want to improve the human condition. That is our vision - it has no expiration date. Through academic health centres, other translational models and by educating the healthcare workforce of the future, our staff, students and alumni directly improve quality of life.

Setting the global health care agenda, the Faculty aspires to lead in all areas of research activity and influence local, national and international policy to improve health and social outcomes and health inequalities. We've made a major impact in the world of medical research and become globally recognised for our quality education of over 41,000 doctors, nurses, and allied health professionals.

We are ambitious and aim to maintain our position as a leading international medical research university. We're recognised for the breadth and depth of our research, for our commitment to translational research, for the quality and scale of our research capability, and as a thriving biotechnology hub.

To learn more about the Faculty, please visit www.monash.edu/medicine.

The Monash Biomedicine Discovery Institute (BDI) is one of the largest and most dynamic biomedical research and teaching environments in Australia. The Institute and its cognate Departments of Anatomy and Developmental Biology, Biochemistry and Molecular Biology, Microbiology, Pharmacology and Physiology comprise over 120 research groups and deliver discipline-focused teaching into our flagship Bachelor of Biomedical Science Degree, the Bachelor of Science Degree, as well as the Medical School and various Health-related Degree Programs. We pride ourselves on an excellent and evolving teaching curriculum and provide world-class teaching and learning space for Biomedical Sciences.

The BDI comprises six inter-disciplinary health-focused research Programs, each led by a renowned leader in the field. The BDI programs include Infection and Immunity, Cancer, Cardiovascular Disease, Development and Stem Cells, Metabolism, Diabetes and Obesity and Neuroscience. The BDI works closely with clinical and drug

development precincts at Monash and has a number of major industry partnerships to facilitate the translation of our research.

For more information about the BDI please visit our website at www.monash.edu.au/discovery-institute.

The **Ramaciotti Centre for Cryo-Electron Microscopy** is a university research platform and is part of the national grid of Microscopy Australia facilities. Its mission is to enable and advance research excellence at Monash University and beyond through the provision of a world-class research capability in electron microscopy for the biomedical sciences.

The Monash Ramaciotti Centre supports research projects in life sciences electron microscopy of researchers from Monash University, national and international research institutes and universities, as well as industry projects. The Centre is home to Australia's first high-end Titan Krios cryo-TEM and has acquired seed funding for a second high-end cryo-TEM through its partnership with Microscopy Australia. It also houses Australia's first cryo-FIBSEM, a Helios G4 UX with a Leica VCT500 cryo-stage. In addition, the Centre has a Talos Arctica, as well as two 120keV TEMs and a FESEM. A suite of advanced sample preparation and other equipment is available, including a Zeiss LSM900 Airyscan with Linkam cryo-stage, a Wohlwend high pressure freezer, Leica AFS2 and FC7 cryo-ultramicrotomes. The facility's expert team supports and collaborates on a large number of life sciences EM techniques ranging from standard SEM and TEM to immuno EM, correlative light and electron microscopy, cryo tomography and single particle analysis. More information can be found on www.monash.edu/researchinfrastructure/cryo-em.

The Ramaciotti Centre collaborates with and provides complementary facilities to the adjacent Monash Centre for Electron Microscopy (MCEM), the Australian Synchrotron and the Melbourne Centre for Nanofabrication (MCN), which are within walking distance.

Microscopy Australia is a national grid of university-based microscopy and microanalysis laboratories, which provide open access to world-class instrumentation and expertise in nanostructural characterisation capability to all Australian researchers.

Funded by the Commonwealth government under the National Collaborative Research Infrastructure Strategy (NCRIS), relevant state governments and with co-investment by the institutional partners, Microscopy Australia's mission is to enable world-class outcomes from Australian research by providing essential infrastructure for the characterisation of materials at the micro, nano and atomic scales.

Comprising nine core institutions with linkages to another five laboratories, Microscopy Australia is a large collaborative research infrastructure facility governed as an unincorporated joint venture that develops and implements a business plan annually in accordance with the overall Microscopy Australia project plan.

POSITION PURPOSE

The Bio-EM Image Analysis Specialist provides expertise in image processing of 2D, 3D, and correlative light and electron microscopy data. The specialist will develop and apply machine-learning approaches to the analysis of life science EM data with an emphasis on improving quantification methods and providing feedback for optimal image acquisition. This includes acquiring and analysing complex data at an advanced level and to perform image analysis including reconstruction, rendering, segmentation, and quantification of 2D and 3D EM and CLEM datasets. The position also works closely with other microscopy staff at the Ramaciotti Centre and collaborates with research groups using the Centre to deliver support and guidance in the use of image analysis software including commercial packages.

Reporting Line: The position reports to the Head, Monash Ramaciotti Centre for Cryo-Electron Microscopy

Supervisory Responsibilities: Not applicable

Financial Delegation: Not applicable

Budgetary Responsibilities: Not applicable

KEY RESPONSIBILITIES

1. Provide expertise, advice and assistance to Ramaciotti Centre users to undertake image analysis. Support and guide researchers in the use of image analysis software including commercial packages

2. Collaborate with researchers from within and beyond the university on merit-based research projects, including acquiring and analysing complex data at an advanced level. Perform analysis including reconstruction, rendering, segmentation, and quantification of 2D and 3D EM and CLEM datasets

3. Develop new image analysis tools and workflows for electron microscopy datasets. Publish and deposit software in the public domain and contribute to research in peer-reviewed journals and, where appropriate, present it at national and international conferences and seminars

4. Provide training in image data analysis. Assist in the production of technical and teaching documentation and contribute to occasional lectures and/or lecture courses and/or workshops on specialist topics

5. Contribute to strategic planning of data management and the achievement of business unit and university goals in area of data analysis

6. Manage and co-ordinate the operation of the image analysis capability of the Monash Ramaciotti Centre in accordance with University policies, procedures and strategic priorities. Manage and co-ordinate date software tools for data analysis; and work with eResearch to maintain workflows for data management

7. Co-ordinate and oversee a work environment of continuous review and improvement of data storage and analysis workflows, business practices, operational processes and service provision

8. Exercise strong budget management for the specialist area or projects managed where required

9. Implement and oversee strategic projects, development and review of policy and procedure, and compliance and quality processes relevant to the area of image analysis

10. Develop and maintain strong partnerships with other relevant business units, functional areas, internal and external stakeholders, including negotiating and managing contracts with external service providers where required

11. Assist in the production of technical and teaching documentation and contribute to occasional lectures and/or lecture courses and/or workshops on specialist topics

12. Undertake limited administrative functions primarily connected with support of the instruments and Ramaciotti Centre operations, as well as relevant professional activities associated with electron microscopy

13. Other duties as directed from time to time

KEY SELECTION CRITERIA

Education/Qualifications

1. The appointee will have:
    - postgraduate qualifications or progress towards postgraduate qualifications and extensive relevant experience; or
    - extensive experience and management expertise; or an equivalent combination of relevant experience and/or education/training

Knowledge and Skills

2. Advanced expertise and experience in image analysis

3. Advanced experience in scientific programming

4. Experience in applying machine learning

5. Highly developed planning and organisational skills, with experience establishing priorities, allocating resources and meeting deadlines

6. Highly-developed analytical and conceptual skills including demonstrated ability to quickly assimilate new concepts and information and deliver positive, innovative solutions

7. Excellent interpersonal and communication skills with the ability to provide authoritative advice and effectively communicate and present complex information

8. Advanced computer literacy, particularly with current business management software packages and their various application capabilities

9. Experience in research data management and in working with large datasets, especially those generated from electron microscopy experiments

10. Understanding and experience in the following areas would also be advantageous:
   - High-resolution structure determination and model building using cryo-EM reconstruction algorithms
   - Structural analysis by tomography data sets
   - Analysis and visualisation of data sets from nanotomography and correlative light and electron microscopy

OTHER JOB RELATED INFORMATION

- Travel to other campuses of the University may be required
- There may be a requirement to work additional hours from time to time
- There may be peak periods of work during which taking of leave may be restricted
- Occasional travel may be required to attend conference and/or to visit international collaborators

GOVERNANCE

Monash University expects staff to appropriately balance risk and reward in a manner that is sustainable to its long-term future, contribute to a culture of honesty and integrity, and provide an environment that is safe, secure and inclusive. Ensure you are aware of and adhere to University policies relevant to the duties undertaken and the values of the University. This is a standard which the University sees as the benchmark for all of its activities in Australia and internationally.