Research Fellow: Structural Biology

Department/Unit	Department of Microbiology
Faculty/Division	Faculty of Medicine Nursing and Health Sciences
Classification	Level B
Work location	Clayton campus
Date document created or updated	24 January 2018

Organisational context

Everyone needs a platform to launch a satisfying career. At Monash, we give you the space and support to take your career in all kinds of exciting new directions. You'll have access to quality research, infrastructure and learning facilities, opportunities to collaborate internationally, as well as the grants you'll need to publish your work. We're a university full of energetic and enthusiastic minds, driven to challenge what's expected, expand what we know, and learn from other inspiring, empowering thinkers. Discover more at www.monash.edu

The **Faculty of Medicine, Nursing & Health Sciences** (FMNHS) is the University's largest research faculty. World-class researchers work across disciplines including laboratory-based medical science, applied clinical research, and social and public health research. The faculty is home to a number of leading medical and biomedical research institutes and groups, and has contributed to advances in many crucial areas. Our expertise in life sciences and biomedicine is recognised both nationally and internationally.

From a teaching perspective, our education curriculum covers a range of disciplines, including medicine, nursing, radiography and medical imaging, nutrition and dietetics, paramedic studies, biomedical sciences, physiotherapy, occupational therapy, behavioural neurosciences and social work. We take pride in delivering outstanding education in all courses, in opening students to the possibilities offered by newly discovered knowledge and in providing a nurturing and caring environment.

To learn more about the faculty, please visit our website: www.med.monash.edu.au/.

The **sub-Faculty of Biomedical and Psychological Sciences (FBPS)** is a unique discovery research precinct of the Faculty of Medicine, Nursing and Health Sciences. The Discovery Precinct is a partnership between (i) Monash Biomedicine Discovery Institute; (ii) Australian Regenerative Medicine Institute: and (iii) Monash Institute of Cognitive and Clinical Neuroscience. The mission is to carry out world-class discovery research that translates to the clinical and commercial sectors. The FBPS Discovery Precinct is home to two ARC Centres of Excellence, namely, (1) Advanced Molecular Imaging and (2) Integrative Brain Function.

We are committed to an inclusive working environment with a particular focus on gender equity. Please visit www.med.monash.edu.au/biomed-psych/index.html for more information on FBPS.

The **School of Biomedical Sciences and Monash Biomedicine Discovery Institute** is one of the largest and most dynamic biomedical research and teaching environments in Australia. The School 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 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 our teaching space is about to be transformed by a new $80 million dollar biomedical teaching building. Opening in 2019, the new building will provide world-class teaching and learning space for Biomedical Sciences.

All research staff in the School are also a member of the **Monash Biomedicine Discovery Institute (BDI)**. The BDI comprises six inter-disciplinary health-focused research Programs, each led by a research leader in the field. The BDI Programs include, Infection and Immunity, Cancer, Cardiovascular Disease, Development and Stem Cells, Metabolic Disease 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.

The School and BDI comprise over 120 research teams that publish over 700 papers in international journals every year. Annual research income is over $50 million, the vast majority of which comes from the NHMRC and ARC. For more information about the School of Biomedical Sciences, please visit our website at www.monash.edu/discovery-institute and www.med.monash.edu.au/sobs/.

The **Department of Microbiology** is one of five departments in the School of Biomedical Sciences. The department teaches undergraduate students at a variety of levels in a broad range of courses, but most of our students are undertaking degrees in Biomedical Science, Science or Medicine. A vigorous postgraduate program is supported, with more than 50 PhD students currently enrolled.

Research within the department aims to understand how various microbes interact with their human or animal hosts at the molecular level, how that interaction can result in disease, and how this can be prevented. The department is well equipped for broad genomic, transcriptomic and proteomic investigations. These are applied to projects designed to increase our understanding of microbial pathogenesis, the development of antibiotic resistance, the immune response to infection, and in vaccine development.

Further details about the department can be found at: www.med.monash.edu.au/microbiology/

Position purpose

A Level B research-only academic is expected to carry out independent and/or team research within the field in which they are appointed and to carry out activities to develop their research expertise relevant to the particular field of research.

The purpose of this positon is to study the structural basis for the abilities of bacterial chemotaxis receptors to sense and distinguish between attractants and repellents.

The project will involve the use of a combination of structural biology, biophysical and microbiological techniques including X-ray crystallography, NMR, ITC, SPR, thermal shift assays, computational docking, molecular dynamics simulations and chemotaxis assays.

Reporting Line: The position reports to Associate Professor Anna Roujeinikova, the Head of the Structural Biology of Bacterial Virulence Factors Laboratory.

Supervisory responsibilities: Assist with the supervision of PhD and Honours students.

Financial delegation and/or budget responsibilities: Not applicable

Key responsibilities

Level B research-only academic will be required to:

1. Conduct research either as a member of a team or, where appropriate, independently and produce conference and seminar papers and publications from that research
2. Design and carry out experimental work aimed to address the research questions within the scope of the grant. Primarily (but not exclusively) this will involve: structure-guided design of protein variants with desired properties; design of expression constructs; protein expression; purification and crystallization; biochemical and biophysical interaction studies; protein structure determination and analysis by means of X-ray crystallography, NMR and/or molecular modelling; chemotaxis assay
3. Contribute to the preparation of research proposal submissions to external funding bodies
4. Perform administrative functions connected with their area of research
5. Participate in overall project management, liaise with the principal investigators on the grant and contribute intellectually to the research direction
6. Keep an immaculate and detailed record of all experimental work

7. Attend and present at meetings associated with the research work
8. Co-supervise honours and postgraduate research projects within the field of the staff member's area of research
9. Contribute to lab maintenance as appropriate

Key selection criteria

Education/Qualifications

1. The appointee will have a PhD in Life Sciences/Biological Sciences, or a related field, and relevant research experience

Knowledge and Skills

2. Solid track record in scientific writing, particularly first-author research papers and/or reviews
3. Extensive experience with X-ray crystallography and either protein NMR or molecular dynamics simulations (applications from outstanding candidates with the knowledge of only one of these techniques will also be considered)
4. Extensive experience with the development of methods for protein expression and purification
5. Experience with chemotaxis assays will be highly regarded
6. Ideally, some experience with biophysical methods of interaction studies (ITC, SPR, thermal shift assays)
7. Ideally, some experience with binding competition assays

Other job related information

- Occasional travel may be required (e.g. to the collaborating labs in Melbourne and Sydney)
- Occasional out of hours work may be required (e.g. overnight shifts at the Australian Synchrotron)

Legal compliance

Ensure you are aware of and adhere to legislation and University policy relevant to the duties undertaken, including: Equal Employment Opportunity, supporting equity and fairness; Occupational Health and Safety, supporting a safe workplace; Conflict of Interest (including Conflict of Interest in Research); Paid Outside Work; Privacy; Research Conduct; and Staff/Student Relationships.