Macquarie’s chemical and biomolecular sciences research is of high international quality. In the most recent Excellence in Research for Australia (ERA) evaluation, we received a rating of ‘performance at or above world standard’ in the sub-disciplines of analytical chemistry, biochemistry and cell biology, microbiology, and physical chemistry.

Macquarie researchers pioneered the study of proteomics – a term actually coined by our researchers – and Macquarie is home to the world’s first dedicated proteomics facility, the Australian Proteome Analysis Facility.

Macquarie is driving major advances in basic and commercial research in analytical spectrometry, glycochemistry, and separation science and instrumental methods. Our researchers are also pioneering new methods in laser spectroscopy, catalysis, and organic geochemistry.

Several of our researchers sit on the editorial boards of international journals including Current Opinions in Molecular Therapeutics, Journal of Nanotechnology, Journal of Proteome Research, Molecules and Proteomics.

As an HDR candidate you will have the opportunity to research alongside some of the best academics and researchers not just in Australia but the world, and have access to outstanding facilities.

AREAS OF SPECIALISATION
- Analytical chemistry
- Atmospheric chemistry
- Biochemistry
- Biomedical proteomics
- Biotechnology
- Chemical biology
- Environmental proteomics
- Glycomics
- Medicinal chemistry
- Metagenomics
- Structural genomics
- Synthetic biology

FACILITIES
- A wide range of mass spectrometers including Quadrupole-TOF, triplequadrupole, triple quadrupole-TOF, quadrupole-Trap, linear ion trap, orbitrap and MALDI-TOF/TOF instruments
- 400 and 600 MHz NMR spectrometers, the latter equipped with a cryoprobe
- Two Leica SP2 fluorescence microscopes, fluorescence spectrometers and plate readers

RESEARCH HUBS
- Australian Proteome Analysis Facility
- Biomolecular Frontiers Research Centre
- Food Omics Research Centre, an Australian Research Council Industrial Transformation Training Centre
- Macquarie node of the Australian Research Council Centre of Excellence for Nanoscale BioPhotonics
- Macquarie University Centre for Analytical Biotechnology
Highlights

- Macquarie has strategic alliances with major manufacturers of analytical equipment including Agilent Technologies, AB Sciex, BioRad, Bruker Daltonics, EMD Millipore, GE Healthcare, Shimadzu, Sigma-Aldrich and Thermo. Our researchers maintain extensive networks of collaborations with international research institutions and companies.

- Research on the development of fluorescence probes from natural products led to the spin-off company Fluorotechnics. Additionally, several products have been developed in recent years that are currently marketed by GE Healthcare, GelCompany, In Vitro, Sigma-Aldrich and SERVA.

Support

We give HDR candidates strong academic and administrative support. This includes:

- commencement and completion programs
- discipline-specific research training units, including workshops in research communication, presentation skills, academic writing skills, thesis planning and poster preparation
- experienced supervisors and department-based higher degree research directors
- financial support for research project costs, including top-up scholarships from industry
- regular progress reports and interviews, and work-in-progress presentations in which research candidates receive feedback on their work from academics in their field.

Research leaders

Macquarie is home to many internationally renowned researchers, including:

Professor Ian Paulsen is an expert in bacterial genomics and is in the top one per cent of researchers in the world (ESI, 2014). He is currently utilising ‘big picture’ or global approaches such as genome sequencing, metagenomics and functional genomics to understand how bacteria adapt to different environmental niches through swapping genes with each other.

Associate Professor Mark Molloy is the director of the Australian Proteome Analysis Facility, and has strong interests in biomedical applications, in particular molecular cancer biology. He is developing methods to quantitatively profile changes in protein phosphorylation and is undertaking research to identify prognostic and predictive colorectal cancer biomarkers.