MEDICINAL CHEMISTRY AND PHARMACEUTICAL SCIENCES AT UQ

DISCOVERING AND DEVELOPING NEXT GENERATION DRUGS

Medicinal chemistry and pharmaceutical sciences at UQ provides original technology and research in drug discovery to battle human and animal disease. The concentration of world leaders in medicinal chemistry and pharmaceutical sciences, and their access to world-class facilities and cutting-edge equipment, provides a unique environment to develop new therapies and train the next generation of drug discovery and development researchers for universities, research institutes and pharmaceutical companies.

Major discoveries at UQ in medicinal chemistry and pharmaceutical sciences have delivered globally competitive, foundational work in the chemical and biological sciences, have led to numerous spin-off companies, and compounds in phase 2 and phase 3 clinical trials.

These discoveries provide a foundation to improve health outcomes for a variety of diseases. Success in translation is exemplified by Gardasil®, the human papilloma virus vaccine that is now used globally with over 97 million doses distributed in 120 countries at last count.

The quality of UQ’s research is highlighted by outstanding academic achievements, including membership of the Australian Academy of Science and the Australian Academy of Technological Sciences, and other honours including the Ralph F Hirschmann Award, Adrian Albert Award, the Beckman Coulter Discovery Science ASBMB award and the Queensland Life Sciences Industry Excellence Award. Our research has also been recognised by prestigious National Health and Medical Research Council (NHMRC) Senior Principal, Principal and Australia Fellowships as well as Australian Research Council (ARC) Laureate, Professorial and Future Fellowships and ARC Discovery Outstanding Researcher Awards.

UQ researchers have a wide network of partners including major pharmaceutical companies, with very recent examples including an $8 million project with Pfizer, Queensland and Australian governments to develop new drugs for Type 2 Diabetes and obesity and a $3 million project with Boehringer Ingelheim GmbH on the discovery of pain therapeutics. Both projects are supported by significant ARC Linkage funding. Medicinal Chemistry and Pharmaceutical Science researchers have also attracted numerous NHMRC Program, Project and Development grants and other funding including a $5 million grant from the Wellcome Trust to develop drug resistant antibiotics.

Medicinal Chemistry and Pharmaceutical Sciences research occurs at:
Faculty of Health Sciences
Faculty of Science
Institute for Molecular Bioscience
Australian Institute for Bioengineering and Nanotechnology
Queensland Brain Institute
UQ Diamantina Institute
Queensland Alliance for Agriculture and Food Innovation

UQ has particular expertise in the areas of:
Medicinal and Biomolecular Chemistry
Pharmaceutical Sciences
Drug and Vaccine Delivery

MEDICINAL CHEMISTRY AND PHARMACEUTICAL SCIENCES IN BRIEF

- More than 110 full-time equivalent researchers
- More than 70 PhD and MPhil students in 2013
- More than 990 publications since 2008
- More than $79 million in research funding since 2008
- Pharmacy and Pharmacology research ranked 25th in the world in QS World University Rankings by Subject 2013
- Clinical Medicine and Pharmacy research ranked in the top 75 in the world in the Academic Ranking of World Universities by Field 2013 (Shanghai Jiao Tong ranking)
- Clinical, Pre-clinical and Health research ranked 35th in the world in the Times Higher Education World University Rankings by Subject 2012-13
- Medicinal and Biomolecular Chemistry and Pharmacology and Pharmaceutical Sciences research rated above world standard in the 2012 Excellence in Research for Australia exercise.
Institute for Molecular Bioscience (IMB): improving quality of life through fundamental research, and advancing cures for diseases

IMB is a systems biology institute integrating genomics, transcriptomics, proteomics and computational sciences into its drug discovery pipeline. IMB’s experts in medicinal chemistry, chemical and structural biology, cell biology and pharmacology work with industry to develop drugs. A particular focus is the development of peptide drugs from venoms. Successful lead compounds undergo lead optimisation and pre-clinical development.

IMB has world-class facilities for medicinal chemistry and pharmaceutical sciences, including cutting-edge chemistry, biochemistry and pharmacology laboratories, integrated screening platforms for identifying bioactive compounds and a suite of structure-based drug discovery facilities for advanced solution Nuclear Magnetic Resonance Spectroscopy, Molecular and Cellular Proteomics Mass Spectrometry, UQROCX (Remote Operation Crystallisation and X-ray Diffraction) and Bioinformatics.

Centre for Integrated Preclinical Drug Development (CIPDD): bringing innovation into the drug development toolkit

CIPDD conducts research targeted at innovating the ‘drug development toolkit’, such as improving the methods used to assess whether or not new molecules have suitable pharmacokinetic, efficacy and safety properties to enable them to become medicines for clinical use.

The Centre has world-class facilities and internationally recognised quality credentials (ISO17025 and GLP) from the National Association of Testing Authorities (NATA), meaning that data generated at the CIPDD is accepted for review by international regulatory agencies such as the US FDA, the European Medicines Agency (EMA), and the Australian Therapeutic Goods Administration (TGA). CIPDD has quality systems including bioanalysis and ADME (absorption, distribution, metabolism, elimination) studies, as well as efficacy, safety and toxicology testing. CIPDD is an international leader in the pain field with an extensive portfolio of sophisticated rodent pain models that closely mimic specific human pain conditions, unique in Australia and rare internationally.

Therapeutic Innovation Australia (TIA) Queensland Node: accelerating and increasing the efficiency of Australian translational research in the therapeutic arena

TIA aims to both accelerate and increase the efficiency of Australian translational research in the therapeutic arena by establishing clear facilitated pathways. TIA provides coordinated linkage of translational research capabilities to benefit Australian researchers in industry and academia as well as international companies.

UQ members include the Centre for Integrated Preclinical Drug Development, Queensland Clinical Trials and Biostatistics Centre, UQ Centre for Clinical Research and the UQ Diamantina Institute. The node provides a facilitated pathway to assist researchers in advancing their discoveries from the laboratory through the necessary pre-clinical and clinical translational research steps required for progression towards a new therapy for the treatment of human disease.