



 **Griffith** UNIVERSITY
Griffith Institute for Drug Discovery

**Creating knowledge
that transforms lives**

griffith.edu.au/gridd



Director's welcome

Our purpose at the Griffith Institute for Drug Discovery (GRIDD) is creating knowledge that transforms lives.

GRIDD is dedicated to developing innovative new solutions for devastating conditions including cancer, drug resistance, infectious diseases, and Parkinson's disease.

We're also creating hope for those with spinal cord injuries. Our Professor Emeritus Alan Mackay-Sim was named 2017 Australian of the Year in recognition of his ground-breaking work in stem cell research and spinal cord injury repair.

We achieve our goals through outstanding researchers, an extensive global partnership network and our unique resources for drug discovery: Compounds Australia and NatureBank.

Alongside our research, our leaders train and inspire the next generation of scientists.

Thank you for supporting what we do, whether through industry partnerships, academic and clinical collaboration, grants or donations.

Join us now to tackle the causes of and solutions to human disease.

A handwritten signature in black ink, appearing to read 'Jennifer Martin'.

**Professor Jennifer Martin FAA
BPharm MPharm DPhil (Oxon)**



Cover image
Professor Emeritus Alan Mackay-Sim
2017 Australian of the Year



Unique resources: Compounds Australia and NatureBank

GRIDD tackles devastating diseases using the unique Compounds Australia (CA) and NatureBank resources, and an extensive global network of partners.

We are innovators in chemical biology and drug discovery.

GRIDD's unique resources provide the essential connection between chemists and biologists for drug discovery.

Compounds Australia is the nation's chemistry repository at your fingertips. Housing more than 600,000 chemicals and NatureBank fractions, this facility is expanding to meet increasing demand.

NatureBank is a resource based on natural products from two libraries—one of 10,000 natural product extracts and another of 50,000 natural product fractions. Both are ready for high throughput screening against any diseases. In addition there are more than 45,000 archived biota samples.

Compounds Australia and NatureBank are available for researchers to access worldwide.

Latest technologies

The Institute is a leader in technologies including cell-based **high throughput screening** imagery. Hundreds of thousands of samples can be scanned quickly and accurately to evaluate the effects of drug leads in assays.

GRIDD is unique in using **Fourier Transform Mass Spectrometry (FTMS)** for rapid screening of molecules as part of the drug discovery process. This approach has been independently recognised as among the most important drug discovery technology advances in recent years.

GRIDD uses other cutting-edge methodologies including high-content screening and fragment screening.

Partner with us

Industry and government

Partnerships are essential to GRIDD's drug discovery and development pipeline. The Institute partners widely with industry, not for profits and government and welcomes enquiries from potential new partners. GRIDD's research leaders are scientists with academic and industry experience who know that diversity is critical to find solutions to cancer, Parkinson's disease, drug resistance, spinal cord injury and infectious diseases like malaria.

Funding partners

GRIDD receives funding from a range of government, industry and not for profit partners. Among our key funders, we thank: AEGIUM; the ARC and NHMRC; the Australian and Queensland Governments; Cancer Therapeutics CRC (Cooperative Research Centre); Clem Jones Foundation; Global Health Initiative (GHIT-Japan); Medicines for Malaria Venture; Parkinson's Qld; and Perry Cross Spinal Research Foundation.

Collaboration with fellow researchers and clinicians

No single discipline or researcher can hope to address the complex scientific detective work needed to discover new drugs. Extensive collaboration is how GRIDD leverages its cutting-edge research across many disciplines and around the world. Collaborators include chemists, biologists, microbiologists, clinicians and data analysts.

Donations

Donations are gratefully received and can be made online via griffith.edu.au/gridd/donate, by phone or mail. Donations of more than \$2 are tax deductible.

Community

We engage closely with the broader community especially those affected by the conditions for which we are seeking to find better treatments. Visitors are welcome at GRIDD, where tours of facilities are arranged regularly.

The Institute encourages you to spread the word about our drug discovery research to your friends and family. To find out what's happening, follow GRIDD on Twitter and Facebook.

 @GRIDD_GU

 Griffith Institute for Drug Discovery

'GRIDD has the experience, infrastructure, resources and maturity to lead new drug discovery.'

Peter Johnstone

CEO Clem Jones Group and Chair GRIDD Development Board

New hope for devastating diseases

GRIDD researchers focus on:

- repairing spinal cord injuries
- overcoming antibiotic resistance
- seeking new therapeutic approaches for breast, prostate and pancreatic cancer
- discovering novel drugs for Parkinson's disease and tuberculosis
- finding treatments for malaria, and other neglected tropical diseases.

Here are just a few examples of our work.

Continuing the work of Professor Emeritus Alan Mackay-Sim

Up to 500,000 people globally have spinal cord injuries (World Health Organisation). Researchers at GRIDD's **Clem Jones Centre for Neurobiology and Stem Cell Research** (cjcneurostemcell.org) are investigating cell transplantation approaches to restore motor function and sensation to those with injured spinal cords. Led by Associate Professor James St John, this work is founded on the groundbreaking research of 2017 Australian of the Year Professor Emeritus Alan Mackay-Sim, whose clinical trial showed transplantation of nasal cells into the spinal cord was possible and safe.



Combating superbugs

By 2050, the number of deaths from multi-drug-resistant (superbug) infections is set to soar to 10 million each year with a cost of 100 trillion US dollars each year in economic output (2016 UK Review on Antimicrobial Resistance). The world urgently needs new ways to combat superbug infections. GRIDD Director Professor Jennifer Martin and her team have identified a key regulator of bacterial virulence and are now seeking drugs that block this system to disarm superbugs and stop them from causing infection.

Finding cures for cancer

Cancer is a leading cause of death in Australia, and few families remain unaffected. GRIDD has several teams leading innovative projects to find new treatments. Professor Vicky Avery's team is exploring breast, prostate and pancreatic cancer. Using 3D culturing techniques and high content imaging systems, they are investigating how cancer cells interact, how cancer grows, its progression and prevention. Associate Professor Rohan Davis' team is also investigating prostate cancer, collaborating with Australia's Translational Research Institute (TRI) since 2012. This team recently identified natural product compounds with a unique mechanism, a key progress indicator. And a team led by Professor Sally-Ann Poulsen may offer new hope to combat brain tumours by altering the cellular environment to overcome chemotherapy-resistant brain cancer.

Clinical resources lend strength to battle Parkinson's

Institute Deputy Director Professor George Mellick is exploring the puzzle of Parkinson's disease—focusing on what causes it and how to better treat it. His team's research is supported by access to the Queensland Parkinson's Project (including samples and information from more than 5,000 people). These resources are used together with high content screening and genetic data to shed light on this confoundingly complex illness.

Fighting infectious diseases

In Africa, children die from malaria at the rate of one child every two to three minutes—or 1,000 children per day. Professor Kathy Andrews' team of biologists is hunting for weaknesses in the malaria parasite, and exploiting these weaknesses to develop new approaches to fight drug resistance. Foundation Director Professor Ronald Quinn is seeking a cure for tuberculosis (TB), one of the most common infectious diseases and among the top 10 causes of death globally.

Cell factories and biopolymers

Professor Bernd Rehm leads the Centre for Cell Factories and Biopolymers within GRIDD. The Centre's mission is to research and develop innovative materials and technologies that can provide solutions for global health and environmental challenges. The research focus is the design and biotechnological production of bio-based materials for use as vaccines and diagnostics for conditions including HCV, TB, and cancer.

Spotlight on Discovery Biology

The Discovery Biology laboratory and its Principal Investigator and Head, Professor Vicky Avery are outstanding contributors to GRIDD that attract significant research funding. Prof Avery is also Head, Griffith University Drug Discovery Programme for the CRC for Cancer Therapeutics (CTx) (2007–2020) and Deputy Dean (Research), Griffith Sciences.

Since 2007, the Avery lab has developed innovative high throughput, high content imaging assays to address the world's neglected diseases, working in close collaboration with Medicines for Malaria Venture (MMV); Drugs for Neglected Diseases initiative (DNDi); Bill and Melinda Gates Foundation (BMGF) and the Global Health Innovative Technology (GHIT) Fund. Her lab has contributed to numerous drug discovery platforms. The Avery team was awarded MMV Project of the Year (2007) for innovative use of technology to identify new anti-malarials, and again in 2013 for contributing to the clinical candidate, MMV390048.

Find out more on our research themes at griffith.edu.au/gridd



Study with us

GRIDD welcomes prospective PhD and postdoctoral scientists. As one of our young scientists, you will have access to outstanding infrastructure and resources as well as career development and leadership opportunities. You will be supervised and mentored by exceptional researchers who are as dedicated to developing your career as they are to pioneering research.

Here's what current students say about the GRIDD experience:

David Hilko

David is working with Professor Sally-Ann Poulsen on a medicinal chemistry PhD.

'I chose to study at the Institute as I had done a research project here in undergrad and found it to be a friendly supportive environment with an emphasis on quality research. My experience has been overwhelmingly positive; the people make this Institute a great place to study. I've particularly enjoyed the Australian bush environment in and around the Institute and getting to know people from all around the world who study here.'

Megan Cross

Megan is working with Associate Professor Andreas Hofmann doing a target-based drug discovery project.

'I chose the Institute for the chance to work with my supervisor and be involved in his research. My experience so far has been exciting and eye-opening. This is definitely an environment for growth and we are challenged every day to be creative and critical. Having the opportunity to collaborate and work with students from other disciplines has been very enjoyable.'

Mario Wibowo

Mario works with Associate Professor Rohan Davis and his research focus is phytochemical studies on Australian celastraceae plants.

'My research interest is in the discovery of new and novel natural products. GRIDD is a world-renowned Institute in the field of natural products-based drug discovery. Thus, it is a perfect place for me to strengthen my research skills. In addition, the Institute has state-of-the-art research facilities, which allow me to undertake even more exciting research.'

'My experiences so far have been amazing and I am enjoying my PhD journey. My supervisor has been very helpful during my PhD studies. I have published several papers based on my research, and that could not be done without his expert guidance.'

Contact us

For further information on our resources, technologies and contract research services.

Griffith Institute for Drug Discovery
Buildings N27 and N75
Griffith University
Brisbane Innovation Park, Don Young Road
Nathan Qld 4111
Australia

E | gridd@griffith.edu.au
P | +61 7 3735 6000

 @GRIDD_GU

 Griffith Institute for Drug Discovery

griffith.edu.au/gridd