



we dare to
imagine.

Institute for Molecular Bioscience



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

CREATE CHANGE



The Institute for Molecular Bioscience (IMB) at The University of Queensland is here to make a difference. Named Australia's leading life sciences research institute by the Nature Index, our 300 scientists are working around the clock on solutions to some of society's most-pressing problems - your family's health and well-being, sustainability of our agriculture and environment, and understanding the world around us. Our 170 graduate students are training to be the science gatekeepers of our future. Our core facilities provide cutting-edge equipment and capabilities for our research and our research professionals keep us and our research on track. Together, our team dares to be different, and our research is destined to make a difference.

Being different

At IMB, we tackle big problems from lots of angles using our expertise in chemistry and structural biology, genetics and genomics, bioinformatics and statistics, cell and developmental biology, microbiology, infection and immunity and sustainability. We use our world-class facilities to solve atomic structures, to analyse terabytes of data and billions of base pairs, to pinpoint faulty genes and proteins in human tissues, to replicate human diseases in fish and to seek out new drugs and antibiotics in venoms, plants and soils. We are different because we can take discoveries in nature and turn them into solutions for society.

Making a difference

The highlights captured here show how just some of our recent research has impact through high profile discoveries and landmark publications, through the launch and sale of start-up companies to advance drugs to the clinic, by engaging the public in our search for new antibiotics, by finding answers through data and new technologies and through setting up new alliances with industry and governments. We hope you get a glimpse of our exciting innovation pipeline, our award-winning scientists and what matters most to us and to you - new solutions.



>400 IMBers

173

HDR Students

34

Active Fellowships

86

Industry Partners

465

Journal Articles

2

ARC Laureates

>\$60M

Research Income

5

Highly Cited Researchers

96

High Impact Publications
(Impact factor >10)

19%

of UQ Fractional Nature Index Count

2

Fellows of the Royal Society

13

Spin-out Companies

\$3B

Invested into IMB IP since founding

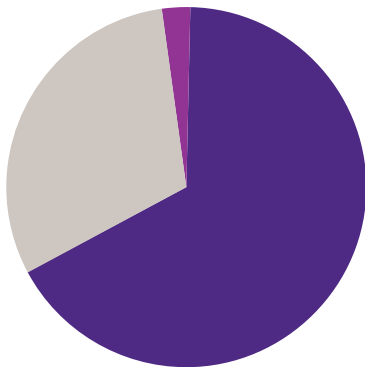
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ARC Linkage Grants

\$35M over 7 years

ARC Centres of Excellence Funding

Total income

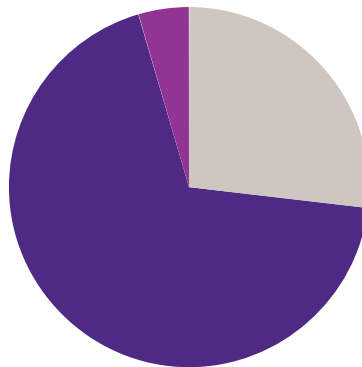


67% Peer Reviewed (Competitive) Income

31% Operating Income

2% Philanthropy, commercialisation, other income and recoveries

Operating income

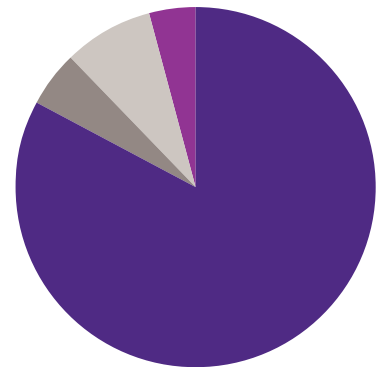


27% UQ Awarded Grants

67% UQ Operating Funding

4% Sales and Services Revenue

Distribution of expenditure



83% Research \$44.6 M

8% Infrastructure \$4M

5% Admin \$2.5M

4% Capital equipment \$2.2M



Research Impact



Repairing hearts with deadly spider venom

A potentially life-saving treatment for heart attack victims has been discovered from a very unlikely source – the venom of one of the world’s deadliest spider. A drug candidate developed from a molecule found in the venom of the K’gari (Fraser Island) funnel web spider can prevent damage caused by a heart attack and extend the life of donor hearts used for organ transplants. The discovery was made by a team led by IMB’s Dr Nathan Palpant and Professor Glenn King, and Professor Peter MacDonald from the Victor Chang Cardiac Research Institute.



Vascular disease in COVID-19 is not caused by viral infection of blood vessels

SARS-CoV-2 virus does not infect blood vessels, despite the high risk of blood clots to COVID-19 patients, IMB researchers found, after investigating how the virus causes damage to blood vessels.

Dr Emma Gordon and Dr Larisa Labzin from IMB and Dr Kristy Short from UQ’s School of Chemistry and Molecular Biosciences found that the cardiovascular complications of COVID-19 are triggered by inflammation caused by infected airway cells. Knowing these complications are caused by inflammation arising from COVID-19 rather than from the virus itself will help in developing treatments, and understanding how and why these complications arise.



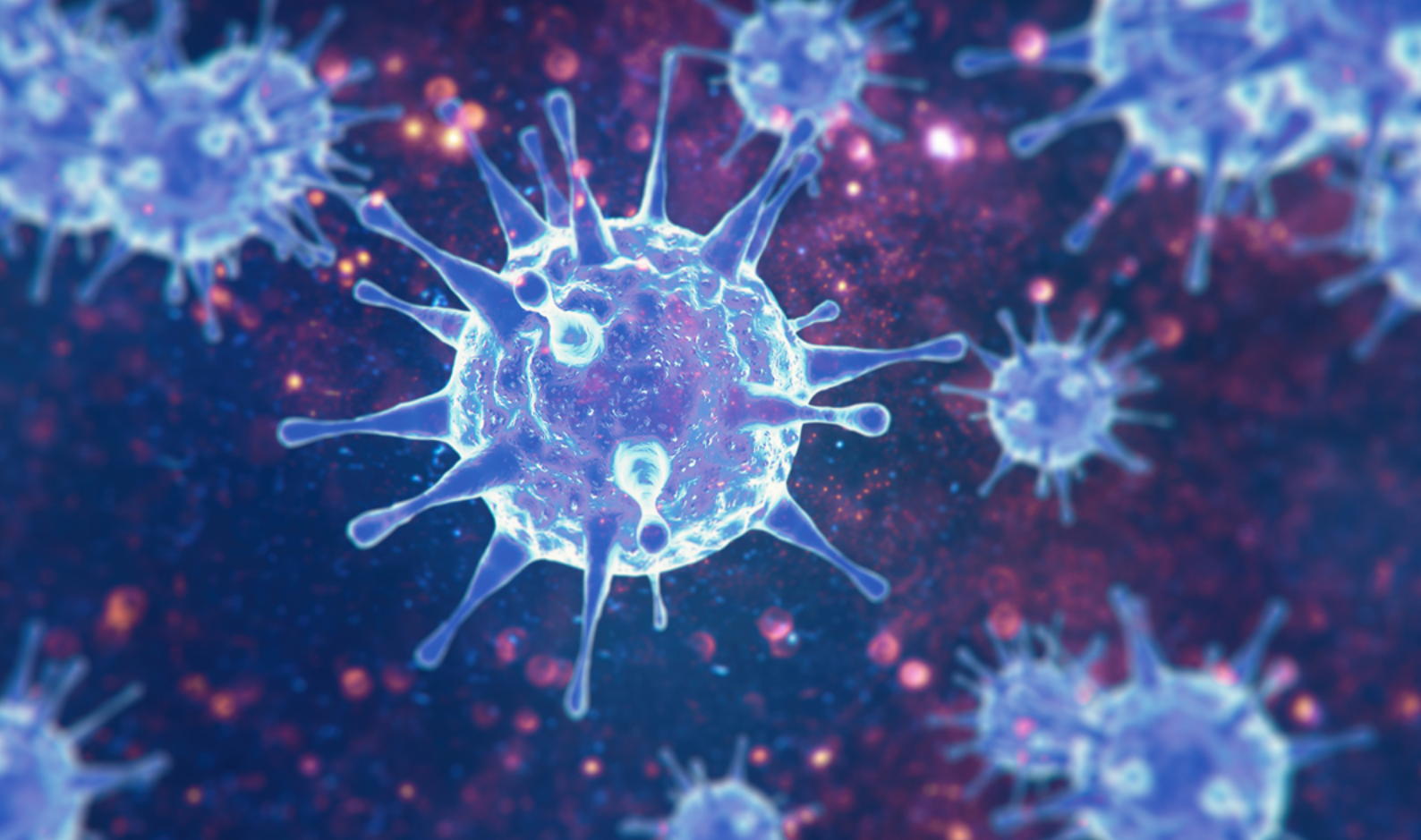
Backyard scientists the key to new antibiotics

Australians were asked to ‘dig deep’ in an Australian-first project, with the next ground-breaking medicine potentially hiding in their backyard. Soils for Science is an IMB citizen science project that aims to unearth new antibiotics in backyards, gardens and farms across Australia. Dr Zeinab Khalil said society urgently needs new antibiotics to treat an alarming surge in drug-resistant bacterial and fungal infections.



Oceans of opportunity for medicines, food and biofertilizer

Better medicines, food, nutraceuticals, nanomaterial and biofertilisers will flow from new Australian Government funding to bolster marine bioproduct innovation. The \$270 million Marine Bioproducts Cooperative Research Centre (MB-CRC) will take algae, seaweed, marine bacteria, animals and waste and refine it into new products. Professor Rob Capon is leading one of three MB-CRC research programs – Australian Marine Bioproducts, ensuring certification of new products as safe, high-quality and environmentally sustainable. Professor Ben Hankamer is a key researcher in another program – Innovative Bioprocessing Technologies, focused on the development of automated manufacturing and refining to produce commercially viable bioproducts.



Chemotherapy with fewer side effects may be on the way

A discovery by IMB researchers may allow some future cancer patients, including children with leukaemia, to avoid their chemotherapy's worst and most debilitating side effects. Professor Irina Vetter and Dr Hana Starobova found the anti-inflammatory drug anakinra substantially reduced the awful nerve symptoms caused by the chemotherapy drug vincristine – without reducing the effectiveness of the chemo.



Researchers identify new pathways to target breast cancer

A pathway helping the breast cancer protein BRCA1 repair damaged DNA was identified by IMB researchers in a study that will inform future targeted therapies. Professor Robert Parton, Professor Alpha Yap and Dr Kerrie-Ann McMahon found that the protein cavin-3 helps BRCA1 repair DNA damage and suppress tumour formation. They also discovered that when cavin-3 is absent, levels of BRCA1 decrease, meaning cells are even more susceptible to tumours.



Establishing antibiotic potential for cannabis

Synthetic cannabidiol, better known as CBD, kills the bacteria responsible for gonorrhoea, meningitis and Legionnaire's disease, a study by IMB and Botanix Pharmaceuticals Limited found. Associate Professor Mark Blaskovich said it was the first time CBD has been shown to kill some types of Gram-negative bacteria, which have an extra outer membrane that makes it harder for antibiotics to penetrate.



Genetic risk for clinical depression linked to physical symptoms

People with a higher risk of clinical depression are more likely to have physical symptoms such as chronic pain, fatigue and migraine. Dr Enda Byrne led a team that found depression is a serious disorder with lifetime risks of poor health. The research aimed to better understand the biological basis of depression, and found that assessing a broad range of symptoms was important.



Gut health and mood genetically entwined

Stomach ulcers are linked to depression, said researchers who conducted the world's largest study of genetic factors in peptic ulcer disease. Professor Naomi Wray and Dr Yeda Wu provided clues to how the gut and brain work together by studying health data from nearly half a million people. Dr Wu said the research supported a holistic approach to caring for patients with gastrointestinal diseases like peptic ulcers.



New lure deal may curb spread of cane toads

An environmentally friendly bait for cane toads developed by IMB and University of Sydney researchers was exclusively licensed to a not-for-profit environmental organisation. The exclusive licence gives Watergum the tools to mobilise a coordinated national campaign to trap cane toads, and builds on Professor Rob Capon's Cane Toad Challenge citizen science project.

Industry engagement

ARC Centre of Excellence for Innovations in Peptide and Protein Science (CIPPS)

The ARC Centre of Excellence for Innovations in Peptide and Protein Science (CIPPS) strives to build a critical understanding of peptides and proteins in order to unleash the potential of these biomolecules for human benefit. We will discover nature's untapped reservoir of peptides and proteins, decode their structures and functions, and develop enhanced synthetic technologies to address biology's next grand challenge—the design of peptides and proteins for targeted scientific, agricultural, biotechnology, animal health and pharmaceutical applications.

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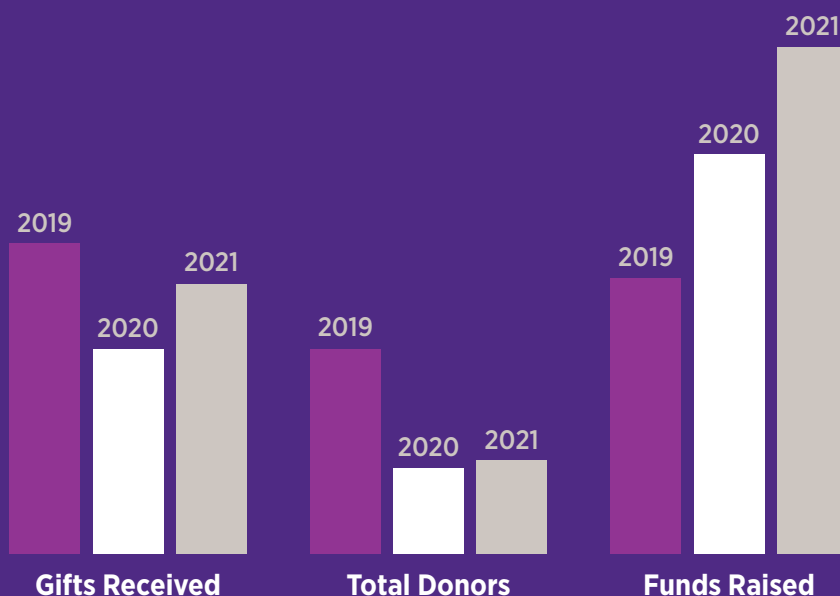
Inflazome

A start-up company developing treatments for inflammatory diseases based on a research partnership between The University of Queensland and Trinity College Dublin (TCD) has been acquired in a landmark deal – one of the largest in Australian and Irish biotech history.

Inflazome has been acquired by Swiss multinational pharmaceutical company Roche for an upfront cash payment of \$A600 million, plus additional payments based on the achievement of certain milestones. The acquisition gives Roche full rights to Inflazome's portfolio of drugs.

Marine Bioproducts CRC

Marine Bioproducts CRC is the largest competitive research funding program in Australia with successful CRCs galvanising in excess of \$300m in cash and in-kind resources including up to \$70m of cash funding from the Commonwealth Government. The objective of the MB-CRC is to transform Australia's emerging marine bioproducts sector into a globally competitive industry. The focus will be on the industry and market-driven innovations to improve both the supply chain and value chain to deliver economies of scale and competitive capacity for Australia to access high value markets across the globe



 **36**
Alumni

 **38**
Staff

 **3**
Foundations

 **12**
Corporate

 **47**
Individuals

Community engagement and philanthropy

Every great research achievement starts with an idea.

This was the goal behind the inaugural Ignite Innovation Awards, launched with the support of donors in 2021: to encourage innovative ideas and foster an entrepreneurial culture within the next generation of scientists.

For inaugural award winner Dr Melanie Oey, it was the opportunity to pursue a longstanding curiosity about how microalgae could be used to make wound-healing oxygen therapies cheaper.

“The project had been on my mind for some time, but due to a lack of funding, we’d never had the chance to pursue it,” Dr Oey said.

“Now, thanks to the support of donors, we’re already working across multidisciplinary teams – plant biologists, material scientists, immunologists, clinicians and more – to create a totally novel platform for wound-healing technologies.”

Since winning the award – which provided seed funding raised by donors to the initiative – Dr Oey has already produced

promising data, sparking key conversations with potential industry partners. So far, she has demonstrated that using microalgae in wound dressings can safely remove carbon dioxide and supply oxygen from a wound, and at a fraction of the cost of current oxygen therapies (roughly \$10 compared to \$100,000).

“Winning the award encouraged me to start bringing science closer to the community, because in the end, we’re here to help the people around us,” Dr Oey said.

“I am daring to imagine that one day, photosynthetic oxygen supply will find a broader application; potentially even oxygen supply to organs.

Thank you to the Grummitt family for their shared vision to empower more bright minds, just like Dr Oey, through establishing the Grummitt Family Ignite Innovation Award – and to the many donors, staff and students who shared their vision in supporting this fund too.



24 Tours
with 150 attendees



32 Events
with 1103 attendees



43 Director's
Circle members
(24 lifetime, 19 annual members)

Director's Circle

Scientific discovery and collaboration are key to a better future. We are grateful for our community of dedicated like-minded supporters in the Director's Circle who are the fuel that powers our committed researchers to close in on new treatments, drug discovery and insights that can shape a healthier world.

Join the Director's Circle today and together we can make a difference.





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