2018-2019 ANNUAL REPORT

QIMR Berghofer
Medical Research Institute

Acknowledgement of country

QIMR Berghofer acknowledges the Turrbal and Yuggerah People as the traditional owners of the land where its buildings are located. The Institute also acknowledges the important role of Aboriginal and Torres Strait Islander people and their communities where research is conducted.

Communication objectives

The QIMR Berghofer 2018–2019 annual report provides a record of the Institute's performance in the 2018–2019 financial year and audited financial statements. All achievements are documented against the goals and corresponding key performance indicators of the Institute's Strategic Plan (2018–2022).

To provide your feedback or request copies of this annual report, contact the Department of External Relations, QIMR Berghofer, by telephoning +61 7 3362 0222 or by emailing enquiries@qimrberghofer.edu.au.

The report is also available online at www.qimrberghofer.edu.au/about-us/annual-reports.

QIMR Berghofer is committed to providing accessible services to people from culturally and linguistically diverse backgrounds. If you have difficulty understanding the annual report, contact the Department of External Relations, QIMR Berghofer, by telephoning +61 7 3362 0222, to arrange an interpreter to effectively communicate the report to you.

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QIMR Berghofer
Medical Research Institute

2 September 2019

The Honourable Dr Steven Miles MP
Minister for Health and Minister for Ambulance Services
PO Box 48
BRISBANE QLD 4001

Dear Minister

I am pleased to submit for presentation to the Parliament the Annual Report 2018-19 and financial statements for the Council of the Queensland Institute of Medical Research (trading as QIMR Berghofer Medical Research Institute).

I certify that this Annual Report complies with:

- the prescribed requirements of the *Financial Accountability Act 2009* and the *Financial and Performance Management Standard 2019*, and
- the detailed requirements set out in the *Annual Report requirements for Queensland Government agencies*.

A checklist outlining the annual reporting requirements can be found on the final pages of this Annual Report or accessed at the Institute's website:

www.qimrberghofer.edu.au/annualreport

Yours sincerely

PROFESSOR ARUN SHARMA AM
Chair
QIMR Berghofer Council

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Vision and values

Vision

To be a world-renowned medical research institution that translates discoveries into clinical practice.

Values

In pursuit of its vision, the Institute is committed to:

- Translation—the ability to bring research discoveries from the laboratory bench to the hospital bedside
- Scientific quality—delivering high-quality research aimed at preventing and curing disease throughout Queensland, Australia and the world
- Commercial consequence—connecting with industry to boost health outcomes and economic benefits
- Societal impacts—demonstrating the value in improving health and quality of life by addressing the major health needs of society
- International reputation—attracting researchers, funding and collaborators from around the world to cement international recognition
- Community engagement—working with the community to address health issues affecting their wellbeing through community education and fundraising programs
- The State of Queensland— improving the health of all Queenslanders, as the state's statutory medical research institute.

Professor Frank Gannon addresses a public forum on dementia.

Highlights

Cancer

- Conducted Australia's first clinical trial using genetically engineered immune cells to make bone marrow transplantation for blood cancer safer.
- Led a major international study which discovered that 94 genetic variants increase a person's risk of developing breast, ovarian, prostate and pancreatic cancers, while another 447 variants are harmless.
- Led a policy change, which saw the peak bodies responsible for sun safety advice in Australian and New Zealand adopt a new policy on sunscreen use, recommending that people apply it daily as part of a regular morning routine.
- Discovered why some triple negative breast cancer patients do not respond to a common chemotherapy drug and found a simple blood test could help determine the best treatment.
- Discovered that Australia has regained the title of having the world's highest rates of invasive melanoma.
- Identified a group of proteins that are highly accurate at detecting a common form of oesophageal cancer in its earliest stages, potentially paving the way for a screening test for oesophageal adenocarcinoma.
- Helped to develop an online portal and mobile phone app that will help doctors make decisions about how best to treat patients with certain variants in the BRCA1 and BRCA2 genes.
- Found that people who are overweight could reduce their risk of dying from cancer later in life by up to 30 per cent by losing some weight and maintaining a healthy BMI.
- Found that a compound extracted from the Australian funnel-web spider is highly effective at killing melanoma cells, as well as cells taken from facial tumours on Tasmanian devils.
- Found that overweight and obese women who take aspirin at least once a week may reduce their risk of developing endometrial cancer.
- Discovered for the first time that bowel cancer has five distinct subtypes that are closely related to a patient's age.
- Found that, contrary to past studies from the Northern Hemisphere, Australian airline pilots appear not to be at higher risk of developing invasive melanoma than the rest of the population.

Infectious diseases

- Completed a phase I clinical trial of an immunotherapy for viral infections in organ transplant patients and found that 11 of the 13 patients showed improved symptoms.
- Continued the world-leading ‘human challenge’ clinical trials, in an effort to speed up the development of new anti-malarial drugs.
- With our collaborators, discovered that the dengue fever mosquito poses the greatest danger of spreading the Zika virus in Australia.
- Found that rainwater tanks could provide year-long protection for the dengue fever mosquito in Brisbane and other subtropical areas of Australia, highlighting the need for owners to check and maintain their tanks.
- Co-led a study that used a new technique to greatly accelerate evolution in the test tube by analysing the thousands of different ways the Zika virus can mutate.

Chronic disorders

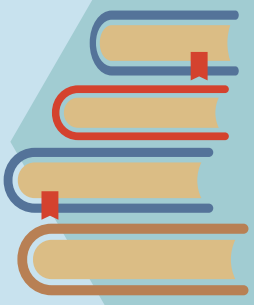
- Completed a world-first clinical trial of a new cellular immunotherapy for multiple sclerosis and found it improved symptoms and quality of life for the majority of patients.
- Conducted the first ever screening of potential heart regeneration drugs using bioengineered human heart muscles, which could revolutionise how heart drugs are developed in the future.
- Identified 40 new genetic markers that increase a person’s risk of developing glaucoma.
- Found there has been a significant increase in the number of Queenslanders being admitted to hospital for treatment of chronic liver disease, and discovered the rates are highest among the state’s most disadvantaged.

Mental health

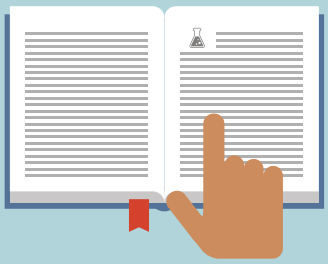
- Discovered that 70 genes contribute to people developing the serious mental health disorders schizophrenia, bipolar disorder, depression and attention deficit hyperactivity disorder (ADHD).
- Launched the Australian arm of the world’s largest genetic investigation into bipolar disorder.
- Generated one of the most extensive computer models of how brain waves interact and change, furthering our understanding of the brain.
- Conducted the world’s largest ever study into the genetic predisposition for cannabis use and identified 35 genes that influence whether people are likely to ever use the drug.

QIMR Berghofer by the numbers

68
Research groups



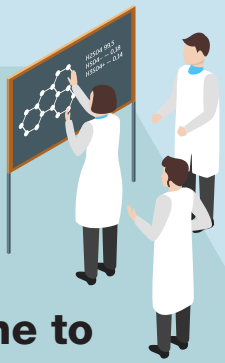
817
Number of papers published in 2018



42 497
Number of citations in 2018

22 **Number of clinical trials led in 2018**

$16.5 million
NHMRC grant funding awarded in 2018



1500+
People who came to the Institute for the school education program

GOVERNMENT HOUSE
QUEENSLAND

Message from the Governor of Queensland

QIMR Berghofer has long enjoyed a world-class reputation for excellence in medical research, and it gives me great pleasure to record that this has once again been manifestly upheld over the past year.

I am immensely proud – as the Governor of Queensland, as Patron of QIMR Berghofer, and as a Queenslander – whenever I hear the accomplishments of the Institute being celebrated in the mainstream media.

Recent research breakthroughs include the identification of the first eight genes linked to anorexia nervosa, which is poised to significantly affect the many thousands of people living with the life-impairing illness.

Coffee lovers everywhere met with immense relief when QIMR Berghofer released significant research clarifying the risk between coffee and cancer.

These examples provide but a glimpse into the impact QIMR Berghofer is having on the everyday lives of people in Queensland and across the globe.

The list of achievements since I last had the honour of penning a message is long and distinguished, and I commend QIMR Berghofer for its tireless commitment to the betterment of the lives of those suffering from cancer, infectious diseases, mental health and chronic disorders.

This life-changing work could not be carried out without the extraordinary efforts of the hundreds of scientists, staff and students, to whom I proffer my gratitude. I thank also the State and Federal governments for their continued investment in the work of the Institute, and I would like to particularly acknowledge the contributions from the many private benefactors whose generosity leads us closer to the next breakthrough in medical research.

Paul de Jersey

His Excellency the Honourable Paul de Jersey AC
Governor of Queensland

Chair's review

It is my great pleasure to report, for the first time, on the activities of QIMR Berghofer Medical Research Institute. I was honoured to be appointed Chair of the QIMR Berghofer Council on 4 July 2019. This great institution has served the people of Queensland and collected a long list of significant achievements over its 74-year history. Along with the seven other newly appointed members and the three continuing members of the Council, I look forward to ensuring QIMR Berghofer continues that proud tradition.

In May, the former Council Chair, Dr Douglas McTaggart, stepped down from the role he had performed, with great distinction, for nearly five years. Dr McTaggart brought invaluable skills, experience and leadership to the Council. He steered the Institute through a period of growth and academic success and he leaves an outstanding legacy. I thank him for his generous and tireless service to QIMR Berghofer, and through it, the state of Queensland.

I take this opportunity to thank the five other members of the QIMR Berghofer Council whose terms have recently come to an end: Mr Christopher Coyne, Emeritus Professor John de Jersey, Mr Ian Fraser, Professor Paula Marlton and Dr Jeanette Young. Along with Dr McTaggart, they have made a great contribution to QIMR Berghofer's success as a world-leading medical research institute over the last 10 or more years. I make particular mention of Christopher Coyne, who ably stepped into the role of Acting Chair and ensured continuity and stability on the Council on a number of occasions.

I also thank the three reappointed Council members – Deputy Chair, Mr Michael Sargent; Professor Alan Pettigrew; and, Professor John Shine AC – for their ongoing service. They bring invaluable experience to the Council.

Finally, I would like to thank the following people for providing strong and stable leadership during this transition and support to the new Council: Director and CEO Professor Frank Gannon, Deputy Director Professor David Whiteman AM, Chief Operating Officer Ms Donna Hancock, and the Support Management Team.

QIMR Berghofer has continued to grow in 2018–2019, with the number of research groups increasing from 63 to 68. The new groups are spread across our Cancer, Infectious Diseases and Mental Health programs. In most cases, the leaders of these research groups have made the leap from post-doctoral researchers and they will continue the research of the senior scientists under whom they have worked and trained at QIMR Berghofer.

A great deal of our research would not be possible without the support of our tremendously generous philanthropists, donors, corporate sponsors and community fundraisers. I thank them all for helping to make our research a reality. In particular, I acknowledge our biggest philanthropic donor, Mr Clive Berghofer AM, for his continued support.

Finally, I take this opportunity to honour the service of QIMR Berghofer's former Council member, Dr John Heron AO, who died in February aged 86. As well as serving as a Federal Government Minister and an Ambassador, Dr Herron also served on the Council. I thank him for the contribution he made to our great, Queensland institution.

Professor Arun Sharma AM

Chair, QIMR Berghofer Council

Director and CEO's review

Every year our researchers make new discoveries that help to save and extend human lives, both in Queensland and around the world. This year they have produced another exciting list of achievements.

Every year, about 10 000 Australians are diagnosed with blood cancers like leukaemia and lymphoma. Bone marrow transplants can be very effective and are often the only hope of a cure for patients with high-risk forms of blood cancer. However, some patients cannot receive a transplant because they do not have a suitably matched donor, while others who have received transplants experience potentially fatal tissue damage from the donor's immune cells. Our researchers have published the results of Australia's first phase I clinical trial using genetically engineered immune cells to make bone marrow transplants safer for blood cancer patients. The team took immune cells from partially matched bone marrow donors and inserted a gene into the cells that allowed them to be killed off if they caused complications. Our researchers showed, for the first time, that these genetically modified immune cells could grow into millions of cells within days.

Also in the field of immunotherapy, in the last year our researchers have published the results of a world-first, phase I clinical trial of a new cellular therapy for multiple sclerosis (MS). The team found the cellular therapy improved symptoms and quality of life for the majority of patients. These improvements included lower levels of fatigue, increased productivity and quality of life, and improvements in vision and mobility. Importantly, the team also found the treatment was safe and without serious side effects. There are currently very limited treatment options for people with more serious, progressive forms of MS. This is the first time in the world a T cell immunotherapy has been used to treat an autoimmune disease and shows, once again, that QIMR Berghofer is at the global forefront of medical research.

Our scientists have also conducted the first ever screening of potential heart regeneration drugs using bioengineered human heart muscles. At the moment, potential new drugs are tested on heart cells or in mice, but those tests do not always accurately replicate the drugs' effects on human hearts. About 90 per cent of the drugs that enter clinical trials show very promising results in the laboratory, but either don't end up working in patients or do not progress due to side effects. The team grew thousands of miniature heart muscles that beat and behave like human hearts. They then used these miniature hearts to screen more than 100 compounds and identified two that may help regenerate damaged heart tissue.

Our researchers have also continued to piece together the complex puzzle of how our genes influence the onset of serious mental health disorders. They led an international study that discovered 70 genes that were not previously known to contribute to people developing schizophrenia, bipolar disorder, depression and attention deficit hyperactivity disorder (ADHD). In the last year, our scientists also launched the Australian arm of the world's largest genetic investigation of bipolar disorder. As we continue to unravel the inherited component of these disorders, we can help to develop more effective, personalised treatments for these often-debilitating conditions.

North Queensland is home to two species of mosquito capable of transmitting the potentially devastating Zika virus: *Aedes aegypti*, better known as the dengue mosquito; and *Aedes albopictus*, better known as the Asian Tiger Mosquito. Together with collaborators, our researchers discovered that the dengue mosquito poses the greatest danger of spreading Zika in Australia. This research will help authorities in North and Far North Queensland to prioritise their mosquito control efforts, and once again, demonstrates the important practical applications of our research.

Our research cannot be developed into new diagnostics and treatments – and become available to patients and the community – until it has been developed into the clinic with commercial partners. That is why QIMR Berghofer places a high priority on entering into industry partnerships. In the last year, we significantly expanded our collaboration with US biopharmaceutical company Atara Biotherapeutics to manufacture cellular immunotherapies for MS and some cancers. The work with Atara will allow world-first clinical trials to be established locally and in the United State and Europe. The Institute's world-class, regulatory-approved

cell therapy manufacturing facility, Q-Gen Cell Therapeutics, was able to expand its manufacturing capacity thanks to a $1.4 million funding injection from the Queensland Government. We sincerely thank the State Government for investing in our capabilities, and, in doing so, allowing us to develop new and better treatments for Queenslanders in the years and decades to come.

The last year has seen the Institute's researchers receive more awards and accolades. Three scientists – Professors Sarah Medland, Mark Smyth and Nick Martin – were recognised as being among the world's most influential researchers in their fields, named in the annual Highly Cited Researchers 2018 List. A team led by Professor Scott Bell won the Infectious Diseases research category at the 2018 Eureka Awards. And our Deputy Director, Professor David Whiteman, was appointed a Member (AM) of the Order of Australia in the Australia Day Honours List. More achievements are detailed in the Review of Achievements section of this report.

This is my final Director's and CEO's Report, with my appointment due to end in January 2020. The QIMR Berghofer Council is currently leading an international search for a new Director and CEO. I joined the Institute in 2011 and since that time, have overseen the Institute's expansion in size, scientific achievements and international standing. It has been my very great pleasure and privilege to lead this outstanding Queensland institution. I am confident the next chapter will be an exciting one for QIMR Berghofer.

Professor Frank Gannon

Director and CEO, QIMR Berghofer

About QIMR Berghofer

QIMR Berghofer is a translational research institute where research develops from the laboratory bench through to the patient's bedside.

The Institute was established in 1945 as a statutory body under the *Queensland Institute of Medical Research Act 1945*. It had the very humblest beginnings, starting operations in a disused World War II army hut in Brisbane's Victoria Park. Since then, QIMR Berghofer has established itself as a world leader in scientific research while retaining its proud role as Queensland's own medical research institute.

QIMR Berghofer focuses on the research areas of cancer, infectious diseases, mental health and chronic disorders. It also has a long-established Indigenous research program. The Institute's priority is to translate research from the laboratory bench to the hospital bedside and the broader community in order to improve human health. It does that by developing new and better prevention strategies, diagnostic tools and treatments. In conducting its research, the Institute supports different Queensland scientific and medical sectors, and promotes and develops links with industry.

Based next to the Royal Brisbane and Women's Hospital at Herston, QIMR Berghofer is home to approximately 1000 scientists, support staff and students. It is home to a TGA-approved facility for the manufacture of cellular immunotherapies. An early-phase clinical trial facility is also based on the premises.

Over its 74-year history, QIMR Berghofer has led global advances in understanding, preventing, diagnosing and treating some of the world's most deadly and debilitating diseases. The Institute is recognised as a world leader in research into the cutting-edge fields of immunotherapy and genomics. It also has an international reputation for its research into skin cancer, malaria and other mosquito-borne diseases, and the genetic risk factors associated with various cancers and mental health disorders.

Governance

Basis of authority

The Institute was established as a statutory body under the *Queensland Institute of Medical Research Act 1945*. Controlled entities have been established under the authority of the State Treasurer and Minister for Health and Minister for Ambulance Services in accordance with the *Statutory Bodies Financial Arrangements Act 1982*.

Governing body

The Council of the Queensland Institute of Medical Research

In accordance with Part 2, Section 4A of the *Queensland Institute of Medical Research Act 1945*, QIMR Berghofer is controlled and governed by The Council of the Queensland Institute of Medical Research (the Council). Under the *Statutory Bodies Financial Arrangements Act 1982*, the Council is a statutory body.

Under the *Queensland Institute of Medical Research Act 1945*, the Council's role is to:

- control and manage the Institute
- raise and accept monies for the purposes of the Institute
- invest monies raised or accepted by the Council for the purposes of the Institute
- invest monies derived from any property or other invested monies of the Council for the purposes of the Institute.

Council membership

The Council must consist of at least seven, but not more than 11, members appointed by the Governor-in-Council. Under the *Queensland Institute of Medical Research Act 1945*, the Minister is to recommend people for appointment as members of the Council. The Minister may have regard to a person's skills, experience and expertise in any of the following areas:

- corporate governance
- public or academic administration
- health or clinical research
- health ethics
- financial management
- fundraising
- any other area the Minister considers to be relevant to the functions of the Council.

The Council met six times in the 2018–2019 reporting year.

Dr Douglas McTaggart

Council Chair (1 July 2018–3 May 2019)

BEc (Hons) (ANU) MA PhD (Chicago) Hon DUniv (QUT) FAICD SF Fin

Dr Douglas McTaggart was appointed Chair of the Council on 27 November 2014 and stepped down on 3 May 2019. He brought strong leadership to the Council of QIMR Berghofer during his tenure.

Dr McTaggart has held various senior positions in the public and private sectors – as well as on industry bodies and public interest groups. He is a director of the Suncorp Group and Chairman of the company's audit committee. He is also the Chairman of Spark Infrastructure and Suncentral Maroochydore, as well as being a member of the Australian National University Council. In March 2012, Dr McTaggart was appointed to the Queensland Government's Independent Commission of Audit and as Chairman of the Public Service Commission, a position he retired from in 2015. He was a member of the Prime Minister's Expert Advisory Panel for the White Paper on Reform of the Federation and has held positions on – including chairing – various industry representative bodies. He continues to serve in advisory roles to governments.

Dr McTaggart has broad experience in financial markets and funds management. He was the Chief Executive of QIC Limited for 14 years until he retired in June 2012. Prior to joining QIC, he was the Under Treasurer and Under Secretary of the Queensland Department of Treasury. He has also had a distinguished academic career as Professor of Economics and Associate Dean at Bond University.

Until his departure from the QIMR Berghofer Council in May, Dr McTaggart also chaired the Institute's Investment Committee, the Executive Employment and Remuneration Committee and the Commercialisation Committee. He was also a member of the Finance and Audit Committee.

Mr Christopher Coyne

Deputy Chair (1 July 2018–3 May 2019)

Acting Council Chair (4 May 2019–3 July 2019)

Mr Christopher Coyne was the Deputy Chair of the Council and became the Acting Council Chair on 4 May 2019, following Dr McTaggart's departure. Mr Coyne retired from the Council on 3 July 2019.

He is a solicitor of the Supreme Court of Queensland and an accredited specialist in the field of commercial litigation. He specialises in insurance law, health law, corporate governance and risk management.

Following his admission as a solicitor in 1979, Mr Coyne practised law in Brisbane and was a partner in the national law firm Clayton Utz from 1984 until 2004.

He is the Vice President of the Council of the Queensland Law Society and a Director of the Incorporated Council of Law Reporting for the State of Queensland. He is a past President of the Medico-Legal Society of Queensland and the Australian Insurance Law Association, and is a former legal member of the Australian Health Ethics Committee.

Mr Coyne was a member of the QIMR Berghofer Executive Employment and Remuneration Committee during 2018–19 and was a Director of the Board of Q-Pharm Pty Ltd (a wholly owned subsidiary of QIMR Berghofer) until its sale in January 2019.

Emeritus Professor John de Jersey

AM BSc (Hons 1) PhD

Emeritus Professor John de Jersey enjoyed a long career in academia until his retirement in 2007.

After obtaining his PhD from The University of Queensland, he undertook research and teaching at the University of Sydney and the Pennsylvania State University. During his career, Emeritus Professor de Jersey maintained an active research program funded largely by the Australian Research Council and the NHMRC. He served as the head of UQ's Department of Biochemistry, as the head of the School of Molecular and Microbial Sciences, and as the Deputy Dean of the Faculty of Biological and Chemical Sciences. In addition, he served for several years as a member of the UQ Senate, elected by the academic board.

Emeritus Professor de Jersey was actively involved in the Australian Society for Biochemistry and Molecular Biology for many years and served as its President between 2001 and 2002. He was also the Secretary-General of the Federation of Asian and Oceanian Societies of Biochemistry and Molecular Biology from 2006 until 2011.

Emeritus Professor de Jersey has undertaken various research projects in protein chemistry and enzymology and is currently part of a team that is seeking to develop biotechnological uses for components of Australian snake venoms.

In 2018–19 he was a member of the QIMR Berghofer Appointments and Promotions Committee.

Mr Ian Fraser

BComm FCA

Mr Ian Fraser is a chartered accountant practising as a non-executive company director.

He has more than 45 years' experience as a business and accounting professional, including 10 years as a director of listed and unlisted public companies and 27 years as a partner with KPMG. He retired as an audit and corporate advisory partner in 2004.

Mr Fraser was Chair of the QIMR Berghofer Finance and Audit Committee and a member of the QIMR Berghofer Investment Committee in 2018–19.

Professor Paula Marlton

MB BS (Hons I) FRACP FRCPA

Professor Paula Marlton is the head of Leukaemia and Lymphoma at the Princess Alexandra Hospital, where she is also the Deputy Director of Haematology.

Her previous appointments include three years at the MD Anderson Cancer Centre in Houston and a recent placement at Memorial Sloan Kettering Cancer Centre in New York. Professor Marlton has extensive experience in clinical research, including as a principal investigator for national and international clinical trials and as a supervisor of translational research integrated with trials. She was the founding Chair of the Australasian Leukaemia and Lymphoma Group (ALLG) Laboratory Science Committee. She also served on the

ALLG Executive for six years, and established and directed the ALLG Tissue Bank for 15 years.

Professor Marlton was Medical Advisor and a board member of the Leukaemia Foundation Queensland for 13 years. She is a member of various government and specialist medical college advisory committees and several disease and drug advisory boards. She also holds a wide range of clinical and academic service roles.

Professor Marlton served as a member of the QIMR Berghofer Council since 2006 and was a member of the Appointments and Promotions Committee.

Professor Alan Pettigrew

BSc (Hons) PhD Sydney, FAICD

Professor Pettigrew has held senior academic and executive appointments at the Universities of Sydney (Deputy Chair, Academic Board), Queensland (Pro Vice-Chancellor and Executive Dean), and New South Wales (Deputy Vice-Chancellor Academic). He was Vice-Chancellor and CEO of the University of New England from 2006 to 2009. From 2001 to 2005 Professor Pettigrew was the inaugural CEO of the National Health and Medical Research Council (NHMRC) of Australia. Professor Pettigrew has been an adviser to the Chief Scientist of Australia (2010–2014), a Professorial Fellow of the L.H. Martin Institute at the University of Melbourne (2010–2018), a member of the Board of the Australian Universities Quality Agency (AUQA) Ltd (2006–2010) and a member of the Cooperative Research Centres Committee (2011–2015). He has been a consultant on leadership, management and research strategy for 11 Australian universities and several international projects. Professor Pettigrew was Chair of the Board of the Illawarra Health and Medical Research Institute from 2014 to 2019. He is currently a Fellow of the Senate at the University of Sydney and a Vice-Chancellor's Representative for Research School Reviews at the Australian National University.

He is the Chair of QIMR Berghofer's Appointments and Promotions Committee and a member of the Executive Employment and Remuneration Committee.

Professor John Shine AC

AC BSc (Hons 1) PhD DSc (Honoris Causa) PresAA

Professor John Shine is President of the Australian Academy of Science, an Emeritus Professor at the Garvan Institute of Medical Research and a Professor of Medicine and Professor of Molecular Biology at the University of New South Wales.

He was the Executive Director of the Garvan Institute of Medical Research from 1990 until 2011. He is a past Chairman of the NHMRC, a past President of the Australian Genome Research Facility and a former Chair of CSL Limited. Until 2011, he was a member of the Prime Minister's Science, Engineering and Innovation Council. Until mid-2016, he was President of the Museum of Applied Arts and Science (Powerhouse Museum and Sydney Observatory).

Professor Shine obtained his PhD from the Australian National University in 1975. From 1975 to 1978, at the University of California, San Francisco, he was instrumental in developing many of the techniques of genetic engineering. He was the first person to clone a human gene and was a central figure in the cloning of the insulin and growth hormone genes. He also determined the first sequence responsible for replication of a cancer-causing virus.

In 2010, Professor Shine was awarded the Prime Minister's Prize for Science, the nation's highest scientific award. He was made a Companion (AC) in the General Division of the Order of Australia in the Queen's Birthday Honours List 2017 for eminent service to medical research.

During 2018–19, Professor Shine was a member of the QIMR Berghofer Appointments and Promotions Committee and the Commercialisation Committee.

Mr Michael Sargent

Mr Michael Sargent has more than 45 years' experience working with some of the world's leading financial groups. His experience includes stockbroking, merchant banking, financial planning and money market operations.

Mr Sargent was a Fellow of the Certified Practicing Accountants and a Fellow of the Securities Institute of Australia, now known as Finsia. He served as the Queensland President and Australian Vice-President of the Institute. Mr Sargent is an active supporter of the community. He was a charter member of the Rotary Club of Brisbane Mid-City. He has served as the club's President twice and has also been a Rotary District Treasurer. He is also a past President of the Royal Automobile Club of Queensland and a former Chairman of RACQ Insurance Ltd and its subsidiary companies.

Mr Sargent is a member of the QIMR Berghofer Finance and Audit Committee, the Investment Committee and the Commercialisation Committee. He is also a Director of the Institute's subsidiary company, genomiQa Pty Ltd.

Dr Jeannette Young

PSM MBBS MBA DUniv(Griffith) DUniv (QUT) FRACMA FFPH FCHSM (Hon)

Dr Jeanette Young has been the Chief Health Officer of Queensland since 2005. Since August 2015, she has also held the role of Deputy Director-General of Queensland Health's Prevention Division. Her role includes, among other things, responsibility for health disaster planning and response; aero-medical retrieval services; environmental health responses; managing communicable disease planning and outbreaks; licensing of private hospitals and schools of anatomy; organ and tissue donation; blood, poisons and medicines; cancer screening; preventive health programs and initiatives; and medical workforce planning and leadership. Every two years, Dr Young produces a report, *The Health of Queenslanders*, to report on the health status and burden of disease in the Queensland population.

Previously she worked in various positions in hospitals in Queensland and Sydney. Dr Young has specialist qualifications as a Fellow of the Royal Australasian College of Medical Administrators and as a Fellow by Distinction of the Faculty of Public Health of the Royal College of Physicians of the United Kingdom. She is an Adjunct Professor at Griffith University, the Queensland University of Technology and The University of Queensland.

Dr Young is a member of numerous state and national committees and boards, including the NHMRC, the Australian Health Protection Principal Committee, the Domestic and Family Violence Death Review and Advisory Board, the Jurisdictional Blood Committee, the Organ and Tissue Jurisdictional Advisory Committee, the National Screening Committee and the Queensland Clinical Senate.

Dr Young was a member of the QIMR Berghofer Commercialisation Committee during 2018–19.

Council meetings

Terms of appointment and meetings attended for the 2018–2019 reporting year were as follows:

Position	Council members	Term	Meetings attended
Chair	Dr Douglas McTaggart	27/11/14–26/11/17	5 of 6
Deputy Chair / Acting Chair	Mr Christopher Coyne	27/11/14–26/11/17	2 of 6
Members	Emeritus Professor John de Jersey AM	27/11/14–26/11/18	5 of 6
	Mr Ian Fraser	8/10/15–26/11/17	6 of 6
	Professor Paula Marlton	27/11/14–26/11/18	5 of 6
	Professor Alan Pettigrew	27/11/14–26/11/18	5 of 6
	Mr Michael Sargent	27/11/14–26/11/18	5 of 6
	Emeritus Professor John Shine AC	27/11/14–26/11/18	5 of 6
	Dr Jeannette Young	27/11/14–26/11/17	4 of 6
Secretary	Ms Donna Hancock	N/A	6 of 6

Council committees

Finance and Audit Committee

The role of the Finance and Audit Committee is to provide independent assurance and assistance to the Council on:

- risk, control and compliance frameworks
- QIMR Berghofer's external accountability responsibilities as prescribed in the relevant legislation
- the appointment of the internal audit function and communications with internal and external auditors.

The committee meets quarterly to review business and financial risk, financial operating performance and audit performance. The committee reviews all issues and recommendations arising from internal audit and the Queensland Audit Office, as well as agreed management actions implemented to address any issues found.

The Finance and Audit Committee has due regard to Queensland Treasury's Audit Committee Guidelines. Its members were:

- Mr Ian Fraser (Chair)
- Dr Douglas McTaggart (to 3 May 2019)
- Mr Michael Sargent
- Mr Mitchell Petrie (external member)

Appointments and Promotion Committee

The Appointments and Promotions Committee helps Council to maintain academic standards at QIMR Berghofer. This involves reviewing proposals for the appointment and promotion of Faculty (senior research staff). The members of the committee were:

- Professor Alan Pettigrew (Chair)
- Emeritus Professor John de Jersey
- Professor Paula Marlton
- Professor John Shine AC
- Dr Joanne Aitken, Head of Research and Director of Cancer Registries, Cancer Council Queensland
- Professor Susan Charman, Centre for Drug Candidate Optimisation, Monash Institute of Pharmaceutical Sciences
- Professor Alan Cowman, Walter and Eliza Hall Institute of Medical Research
- Professor Andrew Grulich, The Kirby Institute
- Professor Michelle Haber, Children's Cancer Institute
- Professor Glenda Halliday, Neuroscience Research Australia

Investment Committee

The Investment Committee is responsible for overseeing the investment of Council funds. The members of the committee were:

- Dr Douglas McTaggart (Chair) (to 3 May 2019)
- Mr Ian Fraser
- Mr Michael Sargent
- Mr John Allpass (external member)

Executive Employment and Remuneration Committee

The Executive Employment and Remuneration Committee is responsible for reviewing the terms and conditions relating to the appointment and remuneration of senior management. The members of the committee were:

- Dr Douglas McTaggart (Chair) (to 3 May 2019)
- Mr Christopher Coyne
- Professor Alan Pettigrew

Commercialisation Committee

The Commercialisation Committee advises Council and management on innovation and potential commercialisation opportunities. The members of the committee were:

- Dr Douglas McTaggart (Chair) (to 3 May 2019)
- Mr Michael Sargent
- Professor John Shine AC
- Dr Jeannette Young

Human Research Ethics Committee

The Human Research Ethics Committee, on behalf of Council, ensures the maintenance of ethical standards in human research and compliance with regulatory guidelines. The committee is comprised of 13 members.

Animal Ethics Committee

The Animal Ethics Committee, on behalf of Council, ensures the maintenance of ethical standards in animal research and compliance with regulatory guidelines in the use of animals in medical research. The committee is comprised of 13 members.

Organisation

Institute leadership

Director and CEO, Professor Frank Gannon

Professor Frank Gannon is the seventh Director and CEO of QIMR Berghofer. He was appointed to the role in January 2011. Prior to that, he was the Director-General at Science Foundation Ireland (SFI) from 2007.

From 1994 until 2007, Professor Gannon was the Executive Director of the European Molecular Biology Organization (EMBO) and a Senior Scientist at the European Molecular Biology Laboratory (EMBL) based in Germany. Between 1981 and 1994, he was the Director of the National Diagnostic Centre and an Associate Professor in the Department of Microbiology at University College Galway, Ireland.

Professor Gannon obtained a Bachelor of Science from the National University of Ireland, Galway in 1970, followed by a PhD from the University of Leicester, England in 1973. He was a post-doctoral fellow at the University of Madison Wisconsin in the United States from 1973 until 1975, before becoming Chargé de Recherche in INSERM at the University of Strasbourg, France from 1975 until 1981.

His major research interest is the regulation of gene expression by the oestrogen receptor, which plays a major role in breast and endometrial cancers. His research has provided leads to new treatments or therapeutic approaches for breast, endometrial and other cancers.

Professor Gannon has authored more than 200 research articles published in international journals. In addition, between 2000 and 2008, he contributed to a monthly editorial in EMBO Reports, of which he was the founding senior editor. He has seven patent applications, four of which are active at present, and he was the founder of both Bimini Ltd (1990) and Elara Pharmaceuticals (2006).

Professor Gannon was a member of the interim Board of Science Foundation Ireland from 2002 until 2004. He was elected a member of EMBO in 1989, Academia Europea in 2004, the Royal Irish Academy in 2007, the Mexican Academy of Medicine in 2008 and The European Academy of Cancer Sciences in 2009. In 2012, Professor Gannon was appointed a Fellow of the Queensland Academy of Arts and Sciences. He serves on the Council of the Australian Academy of Health and Medical Sciences. He has been awarded honorary doctorates by The University of Queensland (Australia), Queens University Belfast (Northern Ireland) and the University of Jozsef Attila, Szeged (Hungary).

Professor Gannon has served on a range of high-level scientific advisory boards at institutes throughout the world. He was the co-founder of the European Life Sciences Forum (ELSF) and the Initiative for Science Europe (ISE), which played significant roles in the establishment of the European Research Council (ERC). He was the Vice President of the European Heads of Research Council and, prior to his move to Brisbane, he was an advisor to the European Union Commissioner for Research and Innovation. Currently, he is a board member of the Australian Association of Medical Research Institutes and a member of the Advance Queensland Expert Panel.

Organisational structure

QIMR Berghofer has a matrix structure where each research group falls into one of four research programs and one of four departments. The departments are divided according to scientific approaches, while the programs are based on different types of diseases.

QIMR Berghofer's organisational structure as at 30 June 2019 is on page 22.

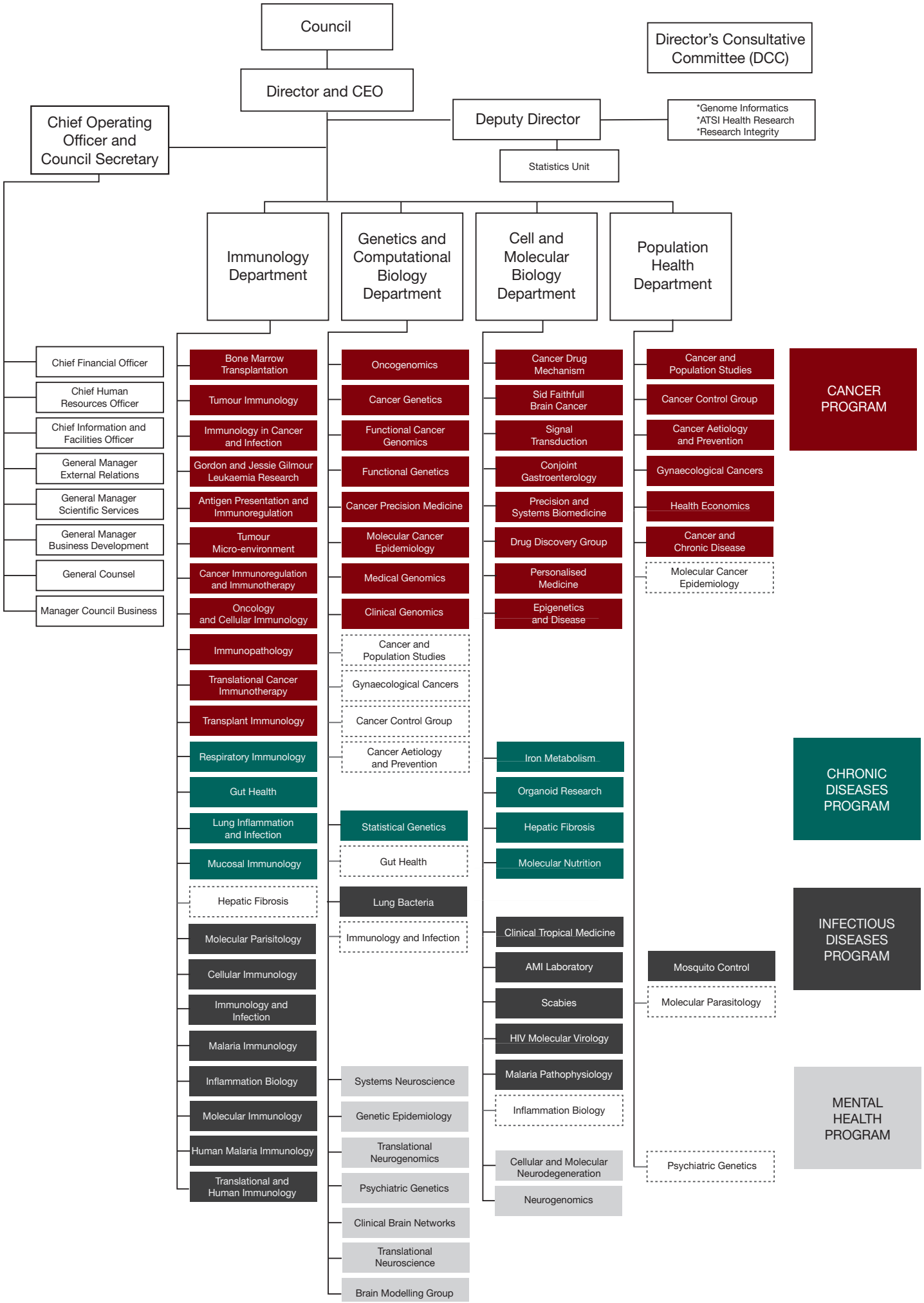
Operating environment

QIMR Berghofer aims to improve health by developing prevention strategies, new diagnostics and better health treatments. Its strategic objectives for 2018–2022 are to:

- foster scientific excellence
- build scientific, institutional and international connectivity
- undertake research with economic, clinical and community consequences
- strengthen enabling mechanisms.

The realisation of QIMR Berghofer's strategic objectives depends on the Institute's success in securing funding from government and non-government sources. In 2018–2019, QIMR Berghofer received $18.9 million from the Queensland Government, representing approximately 15 per cent of total revenue. This – together with competitive, peer-reviewed medical research grants – is QIMR Berghofer's most significant source of funding.

QIMR Berghofer leverages the Queensland Government grant, and the support operations it finances, to secure competitive, peer-reviewed medical research grants. However, competition for research grants is increasing and national success rates have continued to fall in recent years, meaning that QIMR Berghofer is now funding a greater proportion of its research. For that reason, a high priority for the Institute is securing new and ongoing sources of income, particularly from research commercialisation and philanthropic sources.


Council
Director and CEO
Director's Consultative Committee (DCC)
Chief Operating Officer and Council Secretary
Deputy Director
*Genome Informatics
*ATSI Health Research
*Research Integrity
Statistics Unit
Immunology Department
Genetics and Computational Biology Department
Cell and Molecular Biology Department
Population Health Department
Chief Financial Officer
Chief Human Resources Officer
Chief Information and Facilities Officer
General Manager External Relations
General Manager Scientific Services
General Manager Business Development
General Counsel
Manager Council Business
Bone Marrow Transplantation
Tumour Immunology
Immunology in Cancer and Infection
Gordon and Jessie Gilmour Leukaemia Research
Antigen Presentation and Immunoregulation
Tumour Micro-environment
Cancer Immunoregulation and Immunotherapy
Oncology and Cellular Immunology
Immunopathology
Translational Cancer Immunotherapy
Transplant Immunology
Respiratory Immunology
Gut Health
Lung Inflammation and Infection
Mucosal Immunology
Hepatic Fibrosis
Molecular Parisitology
Cellular Immunology
Immunology and Infection
Malaria Immunology
Inflammation Biology
Molecular Immunology
Human Malaria Immunology
Translational and Human Immunology
Oncogenomics
Cancer Genetics
Functional Cancer Genomics
Functional Genetics
Cancer Precision Medicine
Molecular Cancer Epidemiology
Medical Genomics
Clinical Genomics
Cancer and Population Studies
Gynaecological Cancers
Cancer Control Group
Cancer Aetiology and Prevention
Statistical Genetics
Gut Health
Lung Bacteria
Immunology and Infection
Systems Neuroscience
Genetic Epidemiology
Translational Neurogenomics
Psychiatric Genetics
Clinical Brain Networks
Translational Neuroscience
Brain Modelling Group
Cancer Drug Mechanism
Sid Faithfull Brain Cancer
Signal Transduction
Conjoint Gastroenterology
Precision and Systems Biomedicine
Drug Discovery Group
Personalised Medicine
Epigenetics and Disease
Iron Metabolism
Organoid Research
Hepatic Fibrosis
Molecular Nutrition
Clinical Tropical Medicine
AMI Laboratory
Scabies
HIV Molecular Virology
Malaria Pathophysiology
Inflammation Biology
Cellular and Molecular Neurodegeneration
Neurogenomics
Cancer and Population Studies
Cancer Control Group
Cancer Aetiology and Prevention
Gynaecological Cancers
Health Economics
Cancer and Chronic Disease
Molecular Cancer Epidemiology
Mosquito Control
Molecular Parasitology
Psychiatric Genetics
CANCER PROGRAM
CHRONIC DISEASES PROGRAM
INFECTIOUS DISEASES PROGRAM
MENTAL HEALTH PROGRAM

Government objectives for the community

Keep Queenslanders healthy

QIMR Berghofer is highly attuned to the health needs of Queenslanders and directly contributes to the Government's objective of keeping Queenslanders healthy. The Institute does this by researching and creating new and improved prevention strategies, diagnostics and treatments for a range of diseases and disorders. Each of QIMR Berghofer's four research programs – Cancer, Infectious Diseases, Mental Health and Chronic Disorders – has been selected to align with the needs of Queensland. Research into cancer is particularly important given Queensland's ageing population. The Institute has a strong focus on cancer prevention, and has examined in detail the number of cancer cases and deaths that could be prevented through lifestyle changes. Work on infectious diseases, especially tropical diseases, is vital given the increasing numbers of people living in the tropics and the pole-ward migration of species due to climate change bringing tropical diseases closer to major population centres. Research into mental health disorders and neurodegeneration – including depression, dementia and Alzheimer's disease – addresses rises in the incidence of these diseases due to demographic and social changes. Work in the Chronic Disorders program – including into liver disease, asthma and inflammatory bowel disease – addresses many of the health impacts associated with changes in our demographics and lifestyles.

QIMR Berghofer's research also directly contributes to the Government's specific objective of increasing the number of Queenslanders with a healthy bodyweight. The Institute regularly publishes peer-reviewed research that is increasing the body of scientific evidence in favour of maintaining a healthy bodyweight. This includes research into the impact of obesity on cancer incidence and mortality, as well as investigating socio-demographic factors associated with childhood obesity. QIMR Berghofer promotes these research findings via the media to encourage Queenslanders to make healthy lifestyle choices. Researchers in the Institute's Population Health Department are also assessing the effects of a healthy diet on cancer incidence and survival. This research is helping to build an evidence base that will support initiatives to promote healthy diets.

The Institute's research also directly contributes to the Government's specific objective of reducing suicides. QIMR Berghofer has nine research groups in its Mental Health Program and depression, bipolar disorder and schizophrenia are major focuses of their research. QIMR Berghofer is leading the Australian arm of the world's largest genetic study of depression. This major, international effort will help to detect the genetic factors that contribute to clinical depression in order to develop better treatments. In 2018, the Institute launched the Australian arm of a similar study into the genetic factors that contribute to bipolar disorder. QIMR Berghofer has continued to lead a randomised control trial investigating the most effective program for getting people with serious mental health disorders to do more physical activity. Regular exercise has been shown to significantly reduce mental distress in people with mental illnesses.

Give all our children a great start

QIMR Berghofer's research is helping to ensure all children receive the best start in life, with a number of key researchers focusing heavily on infant health. The Institute has recently recruited a research group whose work focuses on nutrition and allergies, specifically on the interplay between the gut, the immune system and disease. Another research group is investigating the link between nutrition, gut bacteria, the immune system and the onset of allergies in small children. QIMR Berghofer also has a research group that is heavily focused on iron intake in early postnatal life, which has significant implications for infant nutrition and complementary feeding. The Institute's Population Health Department has also published a number of nutritional studies involving children. In 2018–2019, QIMR Berghofer also developed cellular immunotherapies to treat children suffering from infectious complications and immune conditions.

Create jobs in a strong economy

QIMR Berghofer contributes to the Queensland Government's objective of creating jobs in a strong economy by leveraging the Government's support five-fold annually. During 2018–2019, the Institute continued to grow to 68 research groups and more than 1000 scientists, support staff and students. It is actively recruiting researchers in areas of high importance to Queensland, including tropical diseases, vaccine development, cancer and genetics. QIMR Berghofer has developed two of its key commercial opportunities into new start-up companies,

which are expected to grow and create new job opportunities in the next five years. It is anticipated that more start-up opportunities will come from the Institute's pipeline of research.

QIMR Berghofer is also expanding its commercial and licensing agreements and promoting its scientific services to clients globally. Thanks to a $1.4 million funding injection from the Queensland Government, the Institute has expanded and upgraded its cell therapy manufacturing facility, Q-Gen Cell Therapeutics, allowing QIMR Berghofer to enter into major new agreements with US biopharmaceutical company, Atara Biotherapeutics. This work is creating jobs in the high-value bio-medical sector and is generating investment into Queensland. Finally, QIMR Berghofer is educating and training the scientists of tomorrow by hosting 168 post-graduate students and running a comprehensive high school education program.

Strategic framework

The Institute's strategic plan sets the priorities for its operational activities over the next five years. The strategic plan is available online at www.qimrberghofer.edu.au/about-us/strategic-plan and is updated on 1 July each year in accordance with Queensland Government requirements. Approved by The Council of the Queensland Institute of Medical Research, the revised Strategic Plan (2018–2022) was implemented from 1 July 2018.

Responding to emerging issues

Climate change

QIMR Berghofer's priorities and research program are selected to align with the needs of Queensland and our research program responds to changes in demographics and the environment. As such, the Institute is conducting several programs of research relevant to environmental changes caused by climate change. These include a wide range of research into infectious diseases and mosquito-borne diseases. In particular, the Mosquito Control Laboratory is studying how many factors influence the spread of mosquitoes and other disease vectors, including changes in climate, the built environment, habitat loss and host ecology. The team is aiming to measure all of these factors and use those data to model the likely impact on disease transmission. In addition, QIMR Berghofer has research capability in a number of other aspects of physical and mental health that will be affected by climate change.

Annual review of operations

Each year, QIMR Berghofer reviews its operations and measures its success against the objectives and performance indicators set out in the Strategic Plan (2018–2022) and against the service areas and service standards set out in the Service Delivery Statement in the State Budget documentation. A review of QIMR Berghofer's achievements in 2018–2019 follows.

Review of performance

Review: Foster scientific excellence

In June 2019, QIMR Berghofer was one of only four Australian institutions included in the *Nature* index of the world's top 100 not-for-profit biomedical sciences institutions.

Two of the best indicators of scientific excellence are the number of papers an institute publishes and the number of times those papers are cited by other researchers worldwide. In 2018, QIMR Berghofer published 817 scientific papers, which have already been cited more than 2686 times. All QIMR Berghofer papers ever published were cited 42 497 times in 2018.

In 2018–2019, five researchers joined the '1000 club', meaning a total of 43 QIMR Berghofer scientists have now authored at least one paper that has been cited more than 1000 times. Eleven researchers who were already on the list increased the number of papers that have now been cited more than 1000 times.

Another five researchers joined the '500 club', bringing to 25 the number of QIMR Berghofer scientists who have now authored at least one paper that has been cited more than 500 times. Two researchers who were already on the list increased the number of papers that have now been cited more than 500 times.

Membership of QIMR Berghofer's '1000 club' and '500 club' is detailed in the tables on the following page.

Dr Liam St Pierre loads a DNA agarose gel.

1000 club	
Author	Number of publications cited more than 1000 times
Nick Martin	10
Mark Smyth	7
John Pearson	5
Nick Hayward	5
Georgia Chenevix-Trench	4
Lisa Simms	4
Nic Waddell	4
Ann-Marie Patch	3
Graham Radford-Smith	3
Michelle Lupton	3
Sarah Medland	3
Scott Gordon	3
Christina Xu	2
Conrad Leonard	2
Felicity Newell	2
Frank Gannon	2
Greg Anderson	2
Harsha Gowda	2
Katia Nones	2
Kum Kum Khanna	2
Michael Breakspear	2
Oliver Holmes	2
Scott Wood	2
Stuart MacGregor	2
Adele Green	1
Alan Robertson	1
Amanda Spurdle	1
Anthony White	1
Ashraful Haque	1
Barbara Leggett	1
David Whiteman	1
Don McManus	1
Jason Madore	1
John Whitfield	1
Jonathan Beesley	1
Juliet French	1
Keshava Datta	1
Leon Hugo	1
Nigel Waterhouse	1
Penny Webb	1
Scott Bell	1
Stephen Kazakoff	1
Xiao Qing Chen	1

500 club	
Author	Number of publications with 500 to 999 citations in first or last author position
Mark Smyth	14
Nick Martin	6
Barbara Leggett	5
Adele Green	3
Don McManus	2
Frank Gannon	2
Geoff Hill	2
Kum Kum Khanna	2
Rajiv Khanna	2
Ann-Marie Patch	1
David Duffy	1
David Frazer	1
David Whiteman	1
Grant Ramm	1
John Whitfield	1
Kelli MacDonald	1
Lisa Simms	1
Michael Breakspear	1
Michele Teng	1
Michelle Hill	1
Penny Webb	1
Siok-Keen Tey	1
Stacey Edwards	1
Stuart Macgregor	1
Vicki Whitehall	1

As well as success in publications and citations, QIMR Berghofer researchers were recognised with a number of prestigious accolades in 2018–2019. For example:

- Professor Mark Smyth was named in the annual Highly Cited Researchers 2018 List for his impact on the field of immunology.
- Professor Nick Martin was named in the annual Highly Cited Researchers 2018 List for his influence on both molecular biology and genetics research.
- Professor Sarah Medland was named in the annual Highly Cited Researchers 2018 List for her substantial influence across several fields.
- A team led by Professor Scott Bell won the Infectious Diseases Research category at the 2018 Eureka Prizes.
- Professor Don McManus was awarded the prestigious Sornchai Looareesuwan Medal 2018 for his distinguished achievements in tropical medicine research.
- Professor David Whiteman was appointed a Member (AM) of the Order of Australia in the Australia Day Honours List.
- Professor James McCarthy was elected a Member of the Australian Academy of Health and Medical Sciences.
- Dr Justin Chapman received two awards from mental health and disability support organisation Open Minds for his work to address mental illness in the community through exercise and healthy eating: an Individual Achievement Award; and a separate gong for the design, implementation and evaluation of PCYC's Healthy Bodies, Healthy Minds program.
- Professor Rajiv Khanna AO was named the 2018 Professional of the Year at the India Australia Business Community Awards.
- Associate Professor Michelle Hill was elected the Secretary General of the Human Proteome Organization.
- Professor Bryan Day was appointed a co-Director of the new Centre of Child and Adolescent Brain Cancer Research.

Dr Tobias Bald, Professor David Whiteman AM, Queensland Health Minister Steven Miles, Professor Rajiv Khanna AO, Dr Corey Smith and Dr Antiopi Varelias at the opening of the Brisbane Immunotherapy conference.

QIMR Berghofer holds its annual Council Awards ceremony in December. The recipients of its research awards were:

- Bancroft Medal – Tony Kent
- Ralph Doherty QIMR Berghofer Prize for Outstanding Achievement and Leadership in Medical Research – Professor David Whiteman
- Post-doctoral Prize – Dr Jonathan Beesley
- Long Service Awards – Grace Chojnowski, Penny Groves, Andrew McKee, Professor Andreas Suhrbier, Mark Weaver
- Australian Cancer Research Foundation Prize for Cancer Research Excellence – Dr Michele Teng
- Researcher Recognition Awards – Lisa Simms.

Review: Build scientific, institutional and international connectivity

In 2018–2019, QIMR Berghofer:

- Signed a Memorandum of Understanding with the Metro North Hospital and Health Service to increase already-close ties and help build Herston into a leading health precinct.
- Signed a Memorandum of Understanding with Australia's largest dedicated cancer care provider, Icon Group, to work together to provide better outcomes for cancer patients.
- Collaborated with external researchers on 90 per cent of the Institute's publications. Sixty-two per cent of QIMR Berghofer publications involved international collaborators.
- Hosted 156 visiting scientists, affiliates and honourary/emeritus appointees, and 168 higher degree students who are placed at the Institute by collaborating universities.
- Led the charge in getting Australia's and New Zealand's peak bodies responsible for sun safety advice to reach a consensus on adopting a new policy on sunscreen use.
- Helped to establish the new Centre for Child and Adolescent Brain Cancer Research along with researchers and clinicians from five other collaborating institutions.
- Contributed expertise and analysis to 17 state and federal government consultation processes.
- Continued to contribute to planning for the redevelopment of the Herston health precinct as members of the Herston Precinct Integration Committee, and actively contributed to the Herston-Kelvin Grove Stakeholder Group as part of Brisbane Marketing's Global Precincts initiative.

QIMR Berghofer collaborations

QIMR Berghofer has a long track record of successful and enduring research collaborations with our partner institutions locally, nationally and internationally. Together with UQ, QIMR Berghofer co-founded and co-manages the Australian Skin and Skin Cancer Research Centre, the Australian Infectious Disease Research Centre, the Queensland Mental Health Alliance and the Queensland Emory Development Alliance. Together with the Princess Alexandra Hospital and the Translational Research Institute, QIMR Berghofer established the Queensland Head and Neck Cancer Centre of Excellence. The Institute is a partner in the Herston Imaging Research Facility. QIMR Berghofer is a key member of the Queensland Genomics Health Alliance (QGHA) and has representatives on the QGHA community advisory group. The Institute is also an active member and founder of the Brisbane Diamantina Health Partners (an Advanced Health Research and Translation Centre).

QIMR Berghofer also has members on the Advance Queensland Expert Panel, the Advancing Health 2026 Oversight Committee, the Board of the Association of Australian Medical Research Institutes and the Council of the Australia Academy of Health and Medical Sciences.

QIMR Berghofer brings about policy change on sunscreen use

QIMR Berghofer researchers successfully led the charge in getting the peak bodies responsible for sun safety advice in Australia and New Zealand to adopt a new policy on sunscreen use.

The new policy recommends people apply sunscreen daily as part of a regular morning routine, and not only ahead of planned outdoor activities.

The policy shift follows a national Sunscreen Summit held at QIMR Berghofer in Brisbane in 2018, at which representatives from some of Australia's leading research, medical, public health and advocacy bodies examined the current evidence on sunscreen use.

QIMR Berghofer Professor Rachel Neale said the experts agreed there was now clear evidence on the benefits of daily sunscreen use.

'Up until now, most public health organisations have recommended applying sunscreen ahead of planned outdoor activities but haven't specifically recommended applying it every day as part of a morning routine,' she said.

'In Australia, we get a lot of incidental sun exposure from everyday activities such as walking to the bus stop or train station, or hanging out washing.

'In recent years, it has become clear that the DNA damage that causes skin cancer and melanoma accumulates with repeated small doses of sunlight.

'At last year's Sunscreen Summit, we examined all of the evidence around sunscreen use and we have come to a consensus that Australians should apply sunscreen every day when the maximum UV level is forecast to be three or higher.'

Professor Neale said if people followed the advice, skin cancer rates would decline.

'We know that sunscreen helps to prevent skin cancer. By applying sunscreen every day as part of your morning routine, you're not only reducing your skin cancer risk, you're also potentially saving the health system money down the track,' she said.

'Some people are worried about possible side effects of using sunscreen like nanoparticles, hormonal effects and not getting enough vitamin D.

'There is no consistent evidence that sunscreen reduces vitamin D or causes other harms.'

The policy recommendation is outlined in an article – led by Professor David Whiteman and Professor Rachel Neale – which was published in the *Australian and New Zealand Journal of Public Health*.

Review: Undertake research with economic, clinical and community consequences

In 2018–2019, QIMR Berghofer undertook the following research with economic consequences:

- Expanded our collaboration with US biopharmaceutical company Atara Biotherapeutics to manufacture cellular immunotherapies for multiple sclerosis and some cancers. This will allow world-first clinical trials to be established locally and in the United State and Europe.
- Established a new start-up, EndpointIQ, based on management systems developed in-house.
- Discovered that 94 genetic variants in the BRCA1 and BRCA2 genes increase a person's risk of developing breast, ovarian, prostate and pancreatic cancers, while another 447 variants are harmless. The findings will help give doctors advice on the frequency of early screening and the need for preventative measures like risk-reducing surgery.
- Developed a successful new method for screening potential heart regeneration drugs, which may make heart drug testing cheaper and faster.

In 2018–2019, QIMR Berghofer undertook the following research with clinical and community consequences:

- Led a policy change, which saw the peak bodies responsible for sun safety advice in Australia and New Zealand adopt a new policy on sunscreen use, recommending that people apply it daily as part of a regular morning routine.
- Tested two new anti-malarial drugs in the Institute's 'human challenge' trials in an effort to speed up their development.
- Discovered why some triple negative breast cancer patients do not respond to a common chemotherapy drug and found a simple blood test could help determine the best treatment.
- Helped to develop an online portal and mobile phone app that will help doctors make decisions about how best to treat patients with certain variants in the BRCA1 and BRCA2 genes.
- Led a major, international study that discovered that 94 genetic variants increase a person's risk of developing breast, ovarian, prostate and pancreatic cancers, while another 447 variants are harmless.
- Discovered that more than 200 000 cancer cases could be avoided in Australia over the next 25 years if people maintained a healthy weight and exercised within recommended guidelines.
- Found that overweight and obese women who take aspirin at least once a week may reduce their risk of developing endometrial cancer.
- Identified a group of proteins that are highly accurate at detecting a common form of oesophageal cancer in its earliest stages, potentially paving the way for a screening test for oesophageal adenocarcinoma.
- Led a world-first human trial of the first ever live vaccine against hookworm, a parasitic disease that causes anaemia in children and pregnant women in many developing countries.
- Led a world-first clinical trial of a new cellular immunotherapy for multiple sclerosis and found it improved symptoms and quality of life for the majority of patients.
- Finished a phase I clinical trial of a new immunotherapy for viral infections in organ transplant patients and found that 11 of the 13 patients showed improved symptoms.
- Identified 40 new genetic markers that increase a person's risk of developing glaucoma.
- Discovered 70 previously unknown genes that contribute to people developing the serious mental health disorders schizophrenia, bipolar disorder, depression and ADHD.
- Launched the Australian arm of the world's largest genetic study of bipolar disorder.
- Continued to lead a process of engagement and discussion with Queensland's Indigenous communities to increase awareness of the benefits of introducing genomic analysis.

Clinical trials

In 2018–2019, the Institute led 22 clinical trials as a result of research undertaken at QIMR Berghofer. During the year, QIMR Berghofer scientists were involved in 34 further trials that were led by other researchers or clinicians.

Review: Strengthen enabling mechanisms

In 2018–2019, QIMR Berghofer:

- Expanded and upgraded the Institute's regulatory-approved cell therapy manufacturing facility, Q-Gen Cell Therapeutics, thanks to $1.4 million in funding from the Queensland Government.
- Provided financial support for 19 women scientists as part of the Institute's policy to help women researchers with young children to stay in research.
- Secured $16.5 million in new funding from the National Health and Medical Research Council.
- Secured $2.6 million in funding from the Cooperative Research Centres Program for the Institute's precision analytics start-up genomiQa and analytics and software engineering agency Max Kelsen to apply artificial intelligence to personalised medicine.

Community engagement

As Queensland's statutory medical research institute, QIMR Berghofer is passionate about sharing its research with the community. In 2018–2019, the Institute's researchers spent a combined total of more than 1055 hours on community engagement and school education activities.

Sharing our research

In 2018–2019, QIMR Berghofer:

- Participated in the fourth World Science Festival Brisbane, hosting practical sessions in the laboratory as part of the apprentice programs and offering a range of activities at the Street Science! Precinct. The Institute also travelled to Townsville, Gladstone, Ipswich, Chinchilla and Toowoomba for the regional program events.
- Opened the Institute's doors for Brisbane Open House, giving more than 500 members of the public the opportunity to see inside a medical research laboratory and to do hands-on experiments and activities.
- Hosted a highly successful public forum on dementia, which was attended by 184 people.
- Held the North Queensland launch of the Institute's Tiny Worlds exhibition of medical illustration and microscopy images.
- Hosted 39 public tours of the Institute and attended 24 public speaking engagements involving about 1840 members of the public.
- Shared the Institute's research with the community via the media. Fifty-one media releases were published and media coverage of the Institute reached an estimated audience of more than 58 million people.

QIMR Berghofer staff and students help children with activities at World Science Festival Brisbane.

Education program

In 2018–2019, QIMR Berghofer:

- Gave approximately 1402 Queensland students and more than 133 teachers from more than 69 high schools the opportunity to attend the Institute to participate in the education program.
- Hosted 886 students and 74 teachers from 30 schools for the Day in the Life of a Scientist program, involving hands-on experiments in the Institute's purpose-built education laboratory.
- Hosted 458 students and 30 teachers from 12 schools for the Institute's High School Lecture Series and other seminars, where students come to the Institute to be inspired by world-leading scientists.
- Hosted 38 students from 17 schools as part of the Institute's High School Work Experience program and hosted an additional 20 students from 11 schools for a new holiday science experience program.
- Delivered professional development training in laboratory techniques and conducting practical experiments in the classroom to 29 teachers from 13 schools.
- Addressed approximately 1329 students from 16 schools in Cairns, the Torres Strait, Townsville, Rockhampton, Gladstone and Toowoomba as part of the Regional Roadshow.

Community feedback

In 2018–2019, QIMR Berghofer:

- Hosted six community reference groups, giving 72 community representatives the opportunity to provide input into the Institute's research priorities.

Support from the community

QIMR Berghoer relies on philanthropic support from individual and corporate donors and third-party fundraisers. The Institute thanks its key supporters for 2018–2019:

- Mr Graeme Archibald
- Dr Chris Moore
- Mr John D Story AO and Mrs Georgina Story
- The Estate of Mr Ken Gold
- Biniris Pty Ltd
- Mrs Barbara McKay
- E M Squires Charitable Trust
- The Estate of Mr John A Hale
- The Estate of Ms Joyce Tulloch
- Mrs Lorraine Duckwitz
- Mrs Rae L Peacock
- The Estate of Mr Ian L Craig
- The Estate of Ms Cheryl Lynette Backwell
- Mrs Ailsa Zinns
- The Estate of Mrs Annie J Fursman
- J J Richards & Sons Pty Ltd
- Queensland Community Foundation
- Walking on Sunshine Foundation
- Jeteld Pty Ltd
- Roycorp Pty Ltd
- BT Managed Accounts
- The Estate of Mrs Jean M Renfrey
- The Estate of Mrs Helen J Roberts
- Mr Ivan and Mrs Sandra Mitchell

- Selwyn Thomas Fassifern Ozanne and Doreen Elaine Ozanne Trust
- Mr John G Allpass
- Mr Robert W Marshall
- Mr Keith Maher
- The Estate of Mr Alastair G Dieckmann
- Henry Cyril & Stella May Robjohns Memorial Trust
- Civic Solutions
- Mrs Maureen Stevenson
- Mrs Jacqueline Pascual
- Perpetual Foundation – The John Thomas Wilson Endowment
- The Estate of Miss Isabel M Allpass
- Perpetual Foundation – The Ira, Peace & Ashley Keidge Trust
- Breast Friends Ltd
- Donald and Joan Wilson Foundation
- The Estate of Mr Graham D Moffett
- The Lawrence Edward Wilkins Foundation
- MG Car Club Qld Inc
- Mrs Betty Jurd
- Faithfull Investment Group trust
- Ms Jan Brown – Buck Off Melanoma
- Dr John and Mrs Paulette Goodell
- Murphy Family Foundation
- Dr Elizabeth and Mr John Stanton
- The Estate of Mr Stewart Coggins
- Mr Brian Needham on behalf of Carmel Kneen
- Bartent Pty Ltd
- Skin Cancer Institute (HealthCert)
- The Estate of Mrs Ngaire H Reid
- Tour de Cure Ltd
- The Estate of Mr Ian D Kells
- Pandanus Foundation
- The Estate of Mr John A Wegner
- The Estate of Ms Cicely E Crozier
- Mrs Janine Rees
- The Estate of Mr Noel F Kropp
- The Estate of Ms Mary V Walker
- Let's Find A Cure Foundation
- The Bridget Arman Perpetual Charitable Trust
- Dowling Family Foundation
- Mrs Joan McDonald on behalf of Hazel Harvison
- The Garry Whyte Sea Angel Private Ancillary Fund
- Hare Family Philanthropy
- Mr Joseph Patti
- The Patricia Bosso Memorial Fellowship
- The Osmar Julius Blau and Beatrice Earle Blau Memorial Trust
- Mrs Zoe McGuinness on behalf of Mr John Dierselhuis
- The Nancy May McKenzie Bequest
- Mr Jonathan and Ms Katie Perrins
- Mr Bob and Mrs Debbie Thompson
- Robert George Relf Trust Fund
- The Rebecca L Cooper Medical Research Foundation
- Dr Roberta Edmeades

At the annual Council Awards ceremony, QIMR Berghofer awarded Clive Berghofer Humanitarian Awards to supporters the Thompson family, Courier-Mail journalist Janelle Miles and Bowen-based community fundraisers 'Buck off Melanoma' in recognition of their invaluable support of the Institute.

Statutory obligations and compliance

Risk management

The review and management of risk at QIMR Berghofer is undertaken by the QIMR Berghofer Council through the Finance and Audit Committee. The Institute's management maintains a register of potential risks applicable to functions of the Institute.

Ethics, code of conduct and public service values

Based on the principles set out in the *Public Sector Ethics Act 1994*, QIMR Berghofer has a Code of Conduct for expected workplace conduct, relationships and behaviour of staff, in order to foster a safe and productive work environment for all employees. The Code of Conduct was last reviewed by Council in October 2016.

The ethics principles enshrined in the Code of Conduct are:

1. Integrity and impartiality
2. Promoting the public good
3. Commitment to the system of government
4. Accountability and transparency

Ethical procedures and practices are embedded into QIMR Berghofer's finance, procurement, fundraising and human resources operations. As part of the staff induction program, employees complete mandatory education and training in public sector ethics and the code of conduct, including their rights and obligations in relation to contraventions. This education and training must be undertaken at regular intervals throughout a staff member's employment. In addition to making available online training modules, the Institute's Human Resources department also schedules workshops and team training sessions on request.

In addition to the Code of Conduct, the Institute also operates in consideration of the Queensland Public Service Values: customers first; ideas into action; unleash potential; be courageous; and, empower people.

Audit

Internal audit is a fundamental part of QIMR Berghofer's corporate governance, ensuring the Institute operates effectively, efficiently and economically. The role of internal audit is to provide independent, objective assurance and advice and to bring a systematic, disciplined approach to evaluating and improving the appropriateness and effectiveness of risk management and internal control.

The Finance and Audit Committee oversees the planning, performance and reporting of the internal auditor under the guidance of an annual internal audit plan. The internal audit contractor (KPMG) met with the Finance and Audit Committee at each quarterly committee meeting. The internal audit function has observed the terms of its charter and has due regard to Queensland Treasury's Audit Committee Guidelines.

Identifying areas of significant risk combines a focus on both cyclical reviews of core business processes, as well as reviews of key risk areas. KPMG's integrated governance, risk and controls framework builds on a traditional internal audit model to take a holistic view of QIMR Berghofer's key objectives, risks, controls and supporting structure across the organisation.

The internal audit plan is presented to the Finance and Audit Committee for approval prior to the commencement of the financial year, with consideration given to past internal audit findings, recent and forthcoming changes in systems and processes, key business risks and the period since the last internal audit of each core business process.

Workplace health and safety

QIMR Berghofer operates in compliance with Queensland's *Work Health and Safety Act 2011*. The Institute has a Safety Committee and a Safety Team.

Staffing

At 30 June 2019, QIMR Berghofer had:

- 557.6 full-time equivalent staff (including fixed-term, permanent, part-time and full-time staff, but not including visiting scientists/affiliates, casuals, students or external collaborators on site)
- 68 members of Faculty, including 11 Senior Scientists, 39 Group Leaders and 18 Team Heads
- 168 higher-degree students, who are placed at the Institute by collaborating universities
- 83 casual staff.

Workforce planning and performance

The majority of QIMR Berghofer staff are employed under the QIMR Berghofer Medical Research Institute Enterprise Agreement. Seventy-five per cent of the Institute's employees are employed on fixed-term contracts, as research funding relies on short-term grants. Historically, QIMR Berghofer has maintained a low rate of voluntary staff turnover. In 2018–2019 from a FTE staff of 557.6, the voluntary separation rate was 11.65 per cent.

QIMR Berghofer's workforce planning and performance is supported by a range of policies, procedures and initiatives designed to foster a high-performance culture. This includes a set induction program for new staff, annual online refresher training, annual performance reviews, an extensive annual program of scientific seminars for staff (including dedicated seminar series for PhD students, early-career researchers and support staff), conference attendance/participation, and opportunities for staff development and career progression.

Equal opportunities

Women are strongly represented at QIMR Berghofer, accounting for 57 per cent of the total workforce, 62 per cent of research staff and 61 per cent of students. Women hold senior management roles at the Institute, including as Coordinators of two of the four research Departments, as Deputy Coordinators of three of the four research Departments, and as the Institute's Chief Operating Officer and General Counsel. Forty-three per cent of lead research positions (Faculty) are held by women and 50 per cent of new faculty appointments in the last five years have been women.

To encourage even more women into lead research positions, QIMR Berghofer has a financial assistance scheme. Women scientists employed at the level of senior research officer and higher, who have at least one child below high-school age, can apply for up to $10 000 in financial assistance in addition to their salaries. These funds can be used at the scientist's discretion. Under the policy, women scientists employed at the slightly lower level of research officer, who have at least one child below high-school age, can apply for financial assistance for particular expenses. This could include covering the cost of childcare while the scientist attends a conference, for example.

The Institute also has several other measures in place to make it easier for mothers to return to work, including reserved places for children under two at a local childcare centre, and having a designated room for nursing mothers. QIMR Berghofer also offers parking on premises for all pregnant women in their final month before taking maternity leave.

QIMR Berghofer operates in consideration of the guidelines endorsed by the Council of the Australian Academy of Science to ensure both women and men have equal opportunities to pursue a successful career in science. The Institute has a Gender Equity Committee, flexible work hours, and job-share and part-time employment options to help staff balance their personal and professional lives. Women account for the majority of staff with part-time and job-share arrangements.

Information systems and recordkeeping

QIMR Berghofer's recordkeeping complies with the *Public Records Act 2002*, Information Standard 40 and Information Standard 31. The Institute keeps physical and electronic documents as full and accurate records of its activities, and uses the Total Records and Information Management (TRIM) document management system. This single, standardised system promotes file and information sharing across the organisation, secures access to the Institute's records, improves accessibility and reduces duplication.

Records are not disposed of, or archived, unless duly authorised under the *Public Records Act 2002* or by reference to the Retention and Disposal Schedule (RDS) approved by Queensland State Archives (QSA). All QIMR Berghofer records are registered into TRIM before being transferred to the off-site storage provider or QSA. All QIMR Berghofer hardcopy records stored off-site are managed under legislatively appropriate risk management standards and guidelines. Work continues on ensuring that all record types are identified, and are managed under the retention and disposal schedule, and that all other legislative and other requirements for records management are satisfied.

Records management is undertaken by trained staff and all new Institute employees receive a training session in records management as part of their formal induction process.

Open data

For information on consultancies and overseas travel for QIMR Berghofer, visit the Queensland Government Open Data website: https://data.qld.gov.au.

Research achievements

Cancer Program

Head: Associate Professor Steven Lane

Cancer is a disease caused by abnormal cell growth, which eventually spreads to other parts of the body. Some cancers are common within a family and are clearly inherited, while others are caused by factors in the environment interacting with genetic susceptibilities. Many forms of cancer can be treated successfully if detected early; however, cancer is still one of the major causes of illness and death in Australia and the developed world.

Cancer is the largest research program at QIMR Berghofer, accounting for approximately half the Institute's research. Research in the cancer program includes:

- identifying the genetic, epigenetic and environmental factors affecting an individual's risk of cancer
- studying the molecular changes that are precursors to cancer or that occur during tumour formation and metastasis
- developing and testing novel therapies in the laboratory and in clinical trials.

The program has a strong focus on skin cancers, including melanoma; hormone-related cancers such as breast, ovarian, endometrial and prostate cancer; leukaemia and lymphoma; brain cancer; and tumours of the gastrointestinal tract.

The Institute is a world leader in immunotherapy, which is emerging as the fourth pillar of cancer treatment, alongside surgery, chemotherapy and radiotherapy.

Antigen Presentation and Immunoregulation

Group Leader: Kelli MacDonald

The Antigen Presentation and Immunoregulation Laboratory investigates the contribution of donor and host antigen presenting cells (APCs) to immune responses following bone marrow stem cell transplantation.

The group conducts basic research in immunology using pre-clinical models following three streams:

- APC development
- Antigen presentation
- APC-induced T cell responses and their regulation.

Bone Marrow Transplantation

Senior Scientist: Geoff Hill

The laboratory sought to understand the pathophysiology of graft-versus-host disease (GVHD) and graft-versus-leukaemia (GVL) in pre-clinical and clinical bone marrow transplantation (BMT), with a view to translating these findings into clinical practice. Its work focused on antigen presentation and cellular and cytokine biology in transplantation. The group has increasingly translated findings into patients at the RBWH bone marrow transplant unit, with several clinical intervention studies in progress.

Highlights:

- Discovered that strain-specific antibody therapy prevents cytomegalovirus reactivation after transplantation.
- Found that bone marrow transplantation generates T cell-dependent control of myeloma in mice.
- Determined that TIGIT immune checkpoint blockade restores CD8+ T cell immunity against multiple myeloma.
- Expanded IL-17A-secreting CD8(+) mucosa-associated invariant T cells in peripheral blood following stem cell mobilisation.

Cancer Aetiology and Prevention

Group Leader: Rachel Neale

Deputy Coordinator, Population Health Department

This group's primary focus is the D-Health trial, which is the world's second largest clinical trial of vitamin D supplementation. There are more than 21 000 participants enrolled in the study, which is now in its fifth year. The group has begun analysing data from the trial.

The Cancer Aetiology and Prevention Group's other focus is the PREPARES trial, which is a phase I clinical trial of a telehealth-delivered counselling intervention for patients with pancreatic cancer and their carers.

Highlights:

- Continuing the D-Health trial, with more than 80 per cent participant retention.
- Completing the PREPARES trial, which confirmed the potential benefit of a counselling intervention for pancreatic cancer patients.
- Publishing the results of the 2018 Sunscreen Summit – a recommendation that sunscreen be applied daily as part of a morning routine – which led to widespread media attention.
- Publishing a systematic review of sunscreen and vitamin D.

Cancer and Chronic Disease

Team Head: Patricia Valery

This group focuses on three main, broad research areas:

- management of chronic liver disease and liver cancer
- patterns of care of Aboriginal and Torres Strait Islander people with cancer, including diagnosis, use of health services, supportive care needs, cancer treatment and survival
- descriptive epidemiology of cancer and chronic liver disease (such as incidence, trends and geographic distribution of disease).

A particular focus is the optimal management of cirrhosis in Australia. The group's findings will provide a better understanding of the treatment path and quality of care provided to Queensland patients with cirrhosis.

Another area of focus for the group is improving cancer care within indigenous primary health care. Findings from their research examining the coordination and continuity of care of indigenous cancer patients will transfer knowledge into policy and practice.

The group also collaborates with other groups on research into non-alcoholic fatty liver disease, childhood cancers, cervical, bone and lung cancers, chronic respiratory disease and multiple sclerosis.

Highlights:

- Showed that the number of cirrhosis admissions in Queensland increased by 61.7 per cent between 2008 and 2016. This finding highlights the need for greater awareness of cirrhosis and emphasis on preventive care to reduce the increasing prevalence of cirrhosis and the burden of its complications.
- Examined the coordination and continuity of care of Indigenous cancer patients via a retrospective audit of clinical records in primary health care services and in-depth interviews with health professionals and patients.
- Found that patients with hepatocellular carcinoma (the most common primary liver cancer) have conditional five-year overall survival after diagnosis.
- Assessed a practical approach to screening for non-alcoholic fatty liver disease with clinically significant fibrosis in type 2 diabetes clinics and at-risk populations in primary care, using non-invasive serum biomarkers and liver stiffness measurements. Found a prevalence of clinically significant fibrosis of 28 per cent, which for most patients was a new diagnosis.

Cancer and Population Studies

Senior Scientist: Adele Green

The Cancer and Population Studies Group's main focus is the causes, prevention and management of skin cancer and melanoma. In particular, the group is conducting research into keratinocyte cancers in the community and in solid-organ transplant recipients, who are at much higher risk of developing skin cancer.

The Primary Melanoma Project is studying patients whose melanomas are confined to the skin but at high risk of spreading to better understand prognostic factors and their quality of life after diagnosis.

The group is also studying melanoma and cataracts in commercial airline pilots in Australia to examine possible occupational risks.

Highlights:

- Showed the acceptability and possible effectiveness of providing lung transplant recipients with supplementary fish-oil capsules to prevent skin cancer.
- Documented the effectiveness of a one-stop dedicated skin clinic for transplant patients in terms of treatment of cancers and uptake of preventive behavior.
- Showed that sun-protective behaviour after high-risk primary melanoma diagnosis may prevent the development of subsequent new primary melanomas.
- Conducted a systematic review of literature, confirming and quantifying the increased risk of cutaneous squamous cell carcinoma in transplant recipients treated with the immunosuppressive azathioprine.

Cancer Causes and Care

Team Head: Susan Jordan

The group focused on four main research projects into thyroid cancer, renal cancer, cancer and mortality rates after hysterectomies, and the screening of severely mentally ill people for certain cancers.

Highlights:

- Published results from a large data-linkage study showing that, overall, having a hysterectomy without the ovaries being removed was not associated with a lower risk of ovarian cancer; however, among

women with endometriosis, having a hysterectomy was associated with a profound reduction in risk of ovarian cancer. This may have implications for the decisions that women and their doctors make about management of endometriosis.

- Published five papers showing variations in management of renal cell carcinoma and the determinants of these variations. While survival after treatment for kidney cancer is generally good, this work also demonstrated that significant declines in kidney function are common and are related to how patients are managed.
- Published one of the first comprehensive assessments of the pathways to diagnosis of thyroid cancer.
- Published results from a large data-linkage study that showed that people with severe mental illness are less likely to have cervical cancer screening or prostate cancer screening compared to those without severe mental illness.

Cancer Control Group

Senior Scientist: David Whiteman

QIMR Berghofer Deputy Director

The Cancer Control Group is conducting research into a range of cancers, with a particular focus on skin cancer and melanoma. This research is contributing extensively to skin cancer control policies. A major focus during 2018–2019 was the QSkin Study – a prospective cohort of more than 43 000 Queenslanders being followed for skin cancer and melanoma. The group continued to analyse DNA samples from the QSkin Study.

The group also conducts research into preventable cancers.

Highlights:

- Measured the trends in melanoma incidence in eight populations and found that the incidence in Australia has plateaued, but continues to increase in most other populations.
- Found that more than 200 000 cancer cases could be avoided in Australia over the next 25 years if people maintained a healthy weight and did an hour of moderate-intensity exercise most days.
- Led the development of the new consensus statement on sunscreen use in Australia.
- Found that smokers are at lower risk of melanoma than non-smokers for reasons that are not yet understood.
- Measured the global burden of melanoma that is attributable to ultraviolet radiation.
- Quantified the effect of aspirin on the risk of BCC and SCC of the skin.

Cancer Drug Mechanism

Group Leader: Glen Boyle

The Cancer Drug Mechanisms Group combines molecular and cellular biology with an understanding of drug mechanisms to treat cancer and other diseases. The group's cell and molecular biology work focuses on understanding the molecular mechanisms involved in the progression and metastasis of cancers of the skin (melanoma and cutaneous squamous cell carcinoma) and the oral cavity (head and neck cancer). These mechanisms also impact on the resistance of these cancers to treatment. Identifying and understanding aberrantly regulated pathways in these cancers is crucial before identifying suitable therapeutic agents to treat these diseases and having an impact on patient outcomes.

The group has identified that different sub-populations of melanoma cells within the same tumour are important in the processes of growing and spreading. The team believes that these different cell types cooperate and communicate with each other to enable this to happen. Importantly, one cell type potentially resists killing while in circulation and may shield other cell populations. These findings open up the opportunity to study the way tumour cells communicate and cooperate with each other, to then find a treatment to stop the melanoma cells growing and spreading.

Highlights:

- Identified a novel role of a key factor involved in melanoma invasion in imparting resistance to killing of cancer cells in circulation.
- Established that different sub-populations of melanoma cells within the same tumour are crucial for tumour growth after metastasis.
- Developed a model leading to identifying key molecules involved in peri-neural invasion of squamous cell carcinoma.
- Characterised the molecular effects of a novel agent for treating chronic wounds.

Cancer Genetics

Senior Scientist: Georgia Chenevix-Trench

Coordinator, Genetics and Computational Biology Department

This group's main purpose is to work within international consortia to find inherited genetic variants that influence the risk of, or outcomes from, breast and ovarian cancer. The group has now found almost 200 such genetic loci, as well as one that is associated with ovarian cancer outcomes. The challenge is to find out how they act and which nearby genes they target, which is the group's main focus.

In addition, the group has identified new risk loci using new methods that directly identify genes involved in breast cancer development. Given that there are many loci to pursue, the Cancer Genetics Group is starting to do this with screening methods that allow them to investigate hundreds of candidate target genes at once, in order to find out what the genes actually do.

Highlights:

- Carried out a large, transcriptome-wide association study, which identified 34 genes associated with breast cancer risk at known loci and 14 genes at loci not yet reported for breast cancer.
- Sequenced breast cancers from ATM germline mutation carriers, showing that they often harbor bi-allelic inactivation of ATM, are phenotypically distinct from BRCA1 and BRCA2-associated breast cancers and lack mutational signatures associated with homologous recombination DNA.
- Found that the polygenic risk score is a powerful and reliable predictor of breast cancer risk that may improve breast cancer prevention programs.
- Found that height is associated with overall breast cancer and BMI is associated with pre-menopausal breast cancer in BRCA1 and BRCA2 mutation carriers. Incorporating height and BMI, particularly genetic score, into risk assessments may improve cancer management.

Cancer Immunoregulation and Immunotherapy

Group Leader: Michele Teng

Cancer immunotherapy – which harnesses and enhances tumour-specific T cell responses – has become the fourth pillar of cancer treatment (along with surgery, radiotherapy and chemotherapy). Although cancer

immunotherapies have demonstrated clinical efficacy in many advanced cancers, a significant proportion of patients do not respond. Furthermore, the dosing and scheduling for immunotherapies in combination or with other cancer treatment remains to be optimised. Using different mouse tumour models to mimic human cancers that are responsive or non-responsive to current cancer immunotherapies, the group is evaluating the best combination of treatments that is most likely to be effective for different cancer types.

Highlights:

- Dissected the mechanisms underpinning the efficacy of neoadjvuant immunotherapy.
- Demonstrated that Bat3+ dendritic cells and type I IFN are critical for the efficacy of neoadjvuant cancer immunotherapy.
- Defined the parameters for optimal neoadjvuant immunotherapy and primary tumour surgery.

Cancer Precision Medicine Group

Group Leader: Harsha Gowda

This research group is working on delineating mechanisms of acquired resistance to kinase inhibitors and devising novel strategies to combat therapeutic resistance. The group is deriving resistant clones for kinase inhibitors that are used to treat specific cancers by subjecting corresponding cell lines to selection pressure in vitro. These resistant clones are characterised by employing genomic and proteomic approaches to determine underlying mechanisms that confer resistance. Targeting these mechanisms through therapeutic intervention can potentially overcome drug resistance and result in durable response. The research group is also carrying out multi-omics studies to characterise molecular alterations associated with various cancers. In addition, the group is employing proteogenomics strategies to uncover novel proteins encoded by the human genome.

Highlights:

- Mapped genomic alterations associated with gallbladder cancers.
- Characterised erlotinib resistance mechanism in head and neck cancer that could be potentially targeted in resistant tumours.
- Characterised genomic alterations, protein expression and signaling alterations associated with chronic exposure to cigarette smoke in oesophageal cells.
- Characterised genomic alterations and protein expression changes associated with chronic exposure to smokeless tobacco extract in oesophageal cells.
- Delineated lncRNA expression pattern associated with early-stage breast cancer.

Clinical Genomics

Team Head: Ann-Marie Patch

The Clinical Genomics Group has contributed to academic papers influencing the research fields in ovarian, breast, colorectal and brain cancer and mesothelioma. This group's research has identified genomic heterogeneity in cancer and pre-clinical organoid models of cancer to explore how this affects patients' responses to treatment. With collaborators, they have used whole-genome and single-cell sequencing to understand genomic heterogeneity in malignant pleural mesothelioma cancers.

Highlights:

- Discovered that whole-genome duplication in plural mesothelioma samples is a marker for poor patient outcomes.
- Identified enrichment of sub-clonal variants in the liver metastasis samples originating from primary colorectal cancer that could affect response to therapy.
- Detected heterogeneous sub-populations of cancer cells from single cell sequencing of mesothelioma samples.
- Produced an easy-to-use processing pipeline for RNA sequencing using a common workflow language.

Conjoint Gastroenterology

Group Leader: Barbara Leggett

This group's focus is the molecular and clinical aspects of colorectal polyp and cancer development, with the aims of reducing cancer incidence and improving patient outcomes. The group is particularly interested in a subtype of colorectal polyps called sessile serrated adenomas. They recently discovered that in young patients these polyps are at lower risk of progressing to cancer than in older patients. The group is currently further testing this finding using its mouse model of serrated neoplasia. The group has developed a statistical model to estimate molecular ageing in the intestine and has found that this is greatly accelerated in this model. They are now developing ways to reverse this to prevent the risk of polyps progressing to cancer, including by using the novel form of curcumin. The group has also started a study to develop new strategies to treat the subgroup of bowel cancers that arise from these polyps.

Highlights:

- Discovered a striking association between CpG island methylation in sessile serrated adenomas and increasing patient age, indicating a lower risk of malignancy in young patients and providing data that will be useful for refining sessile serrated adenoma surveillance guidelines.
- Identified clinical and molecular features of colorectal cancers based on genome-wide DNA methylation, expression and mutation profiles.
- Defined genome-scale DNA methylation and transcriptional changes in a murine model for serrated neoplasia.

Drug Discovery Group

Group Leader: Peter Parsons

The Drug Discovery Group has conducted experiments with the anti-cancer drug EBC-46 (tigilanol tiglate) to more closely define its mechanism of action in ablating tumours by direct injection. The potency of semi-synthetic and natural analogues of EBC-46 was determined in human tumour xenografts, revealing that increasing the hydrophobicity and in-vitro potency for activation of PKC had an optimal point, beyond which in vivo potency decreased. Treated tumours expressed a cytokine that might be important in understanding the host's innate response locally to the drug, as well as having implications for systemic action. EBC-46 caused human platelets to release a different cytokine ex-vivo. This activity might assist in cutting off the blood supply as part of the hemorrhagic necrosis characteristic of local response.

A semi-synthetic analogue of EBC-46, WH-1, which is being developed to treat chronic wounds, was found to increase the rate of wound closure and to decrease the level of bacterial markers at the wound site.

A subset of the compounds identified in this group's primary screens display the required characteristics of a suitable human drug compound for treating neurodegenerative disease. The group's co-culture assay will provide a robust secondary screen for the testing of such compounds, which is now underway.

Highlights:

- Defined the structure-activity relationships for chemical modifications of a novel anticancer drug.
- Validated animal models by showing a novel compound's efficacy in wound healing.
- Followed up a gene involved in congenital naevi formation and UV activation of hair follicle melanocytes.
- Set up a co-culture assay as a robust secondary screen for neuro-protectants.

Epigenetics and Disease

Team Head: Jason Lee

Epigenetic modifications change the pattern of expression of genes. In some cases, this can give rise to cancers. The Epigenetics and Disease Group is using small molecule inhibitors to reverse some of these changes and block tumour progression. Having successfully identified combinations of epigenetic-modifying enzyme inhibitors that stop the growth of tumour cell lines – making them more sensitive to clinical treatments or reversing the resistance of some cancers to some therapies – the group is now testing these combinations in animal models. The epigenetic studies target breast, ovarian, head and neck, and lung cancers, as well as melanoma.

The group is seeking to define the molecular mechanisms involved and this has led to a focus on autophagy as being important in some of the model systems.

Highlights:

- Received an Australian Skin and Skin Cancer Research Centre enabling grant and an Ovarian Cancer Research Foundation research grant.
- Obtained a patent for gene testing that can be used to identify patients with aggressive cancers with shorter survival.
- Filed a patent application after identifying a biomarker that can be used to select patients who will benefit most from immunotherapy and others who will need combination therapies.

Functional Cancer Genomics

Group Leader: Stacey Edwards

Genome wide association studies (GWAS) have identified 196 single nucleotide polymorphisms (SNPs) that are associated with an increased risk of breast cancer. However, the vast majority of risk SNPs fall in non-coding regions of the genome, and therefore the target genes are unknown. Over the past year, the Functional Cancer Genomics Group has focused on identifying the target genes and underlying molecular mechanisms at GWAS-identified breast cancer risk regions. Identifying the key target genes and the pathways responsible for risk will increase understanding of the biology underpinning cancer aetiology and provide key targets suitable for future drug repositioning or drug development.

Highlights:

- Using high-throughput capture HiC technology, identified the candidate target genes at 139 breast cancer risk signals, many of which may represent drug repositioning opportunities or may be suitable for future drug targeting.
- Used targeted RNA sequencing to systematically annotate all long non-coding RNA (lncRNA) genes transcribed from 139 breast cancer GWAS signals and assessed their contribution to breast cancer risk.
- Contributed to the largest transcriptome-wide association study evaluating associations of genetically predicted gene expression with breast cancer risk.
- Contributed to the role of non-coding RNAs in BRCA1-deficient cells.

Functional Genetics

Group Leader: Juliet French

Deputy Coordinator, Genetics and Computational Biology Department

The Functional Genetics Research Group's focus is understanding how genetic variants in non-coding regions of the genome influence cancer risk and progression. Until recently, the genetic basis of cancer had only been examined in coding regions, which accounts for less than two per cent of the human genome. However, non-coding regions of the DNA are littered with functional elements that are important in switching genes on and off. This laboratory focuses on how inherited variants identified through genome wide association studies (GWAS) and cancer-specific mutations identified through whole genome sequencing (WGS) can alter these non-coding elements to promote the development of cancer. The ultimate aim is to use genetics to pinpoint the key genes and pathways implicated in the development of cancer to identify new therapeutic opportunities.

Highlight:

- Showed that inherited genetic variants that fall in a new class of genes called long non-coding RNAs may alter a women's risk of breast cancer.

Gordon and Jessie Gilmour Leukaemia Research Laboratory

Group Leader: Steven Lane
Head, Cancer Program

The Gordon and Jessie Gilmour Leukaemia Research Laboratory's focus is generating a living biobank of acute myeloid leukaemia samples. This group is also working to understand why blood cancers progress from early-stage (chronic) disease to aggressive, advanced-stage disease.

Highlight:

- Modelled genomic progression in myeloproliferative neoplasm using in-vivo CRISPR.

Gynaecological Cancers Group

Group Leader: Penny Webb

Coordinator, Population Health Department

The Gynaecological Cancers Group investigates all aspects of ovarian and endometrial cancer epidemiology from aetiology to diagnosis, patterns of care, quality of life and survival. A particular focus is the role of environmental (non-genetic) factors and the interaction between genetic and environmental factors in the causation and prognosis of gynaecological cancers.

Much of this work is conducted within two national, population-based case control studies (the Australian Ovarian Cancer Study and the Australian National Endometrial Cancer Study) and three international consortia (the Ovarian Cancer Association Consortium, Multidisciplinary Ovarian Cancer Outcomes Group and Epidemiology of Endometrial Cancer Consortium). The group has also recently completed the final four-year follow-up for the Ovarian Cancer Prognosis and Lifestyle Study. This study is investigating whether modifiable aspects of lifestyle are associated with outcomes following a diagnosis of ovarian cancer. In a complementary project, the group is using data linkage to assess the relationship between medication use, cancer risk and outcomes.

Highlights:

- Found that among overweight and obese women, those who took standard-dose aspirin at least once a week had a 15 per cent lower risk of developing endometrial cancer. A similar association was seen for other non-steroidal anti-inflammatory drugs, but not for paracetamol.
- In an analysis of data from 1359 Australian women with endometrial cancer, found that obesity, diabetes and other comorbidities were associated with a significantly higher risk of death from causes other than cancer.
- Conducted a Mendelian randomisation study using genetic markers of height to evaluate the relationship between height and risk of ovarian cancer and confirmed that women with a genetic propensity to being taller had an increased risk of ovarian cancer.
- Identified three distinct coping strategies used by women with ovarian cancer. Women who ‘accepted reality’ reported significantly less anxiety and depression and better quality of life 12 months after diagnosis. Those with consistently high use of ‘taking action/positive framing’ reported less depression. And those women with consistently high use of ‘social/emotional support’ reported better quality of life.

Health Economics

Team Head: Louisa Gordon

The Health Economics Group’s research program covers three main areas of health services research: evaluating the economics of clinical genomics projects; assessing the financial consequences to patients with cancer; and, looking at prevention initiatives for skin cancers. These three areas of research all involve health economic modelling techniques, working with clinical collaborators and data linkage activities.

Highlights:

- Were the first researchers to evaluate the value of pathogen genomics to control outbreaks of a serious hospital-acquired infection using advanced modelling techniques. Doing this, showed the use of genomics was highly valuable in infectious disease control.

- Completed a meta-analysis of changes in sunbed use worldwide over the last decade to prevent melanoma and skin cancers.
- Completed a project on the economics of having a single clinic for transplant recipients to have their skin assessments and create higher hospital efficiency.

Immunology in Cancer and Infection

Senior Scientist: Mark Smyth

Coordinator, Immunology Department

The Immunology in Cancer and Infection Group studies the efficiency and mechanism of new cancer immunotherapies. The group has achieved four major goals. Firstly, showing that the inflammatory cytokine IL-18 is critical in the development of the bone marrow disease multiple myeloma. Bone marrow IL-18 levels are prognostic of patient outcome. Secondly, the group has continued to develop lead antibodies against the immune checkpoint molecules, CD96 and TIGIT, which are expressed on immune T cells and natural killer cells. The researchers have discovered their mechanism of action and shown that there is a rationale to take these lead new therapeutics into the clinic. Thirdly, the group has partnered with a small pharmaceutical company to develop new antibodies against the extracellular ATPase enzyme, mouse and human CD39. This is a new target in cancer immunotherapy and the team has defined the mechanism of anti-tumour immunity of these antibodies. Finally, the Immunology in Cancer and Infection Group has shown that the tumour expression of CD155 increases tumour growth and spread and reduces anti-tumour immune response and response to immunotherapy, respectively. The team has shown the importance of this molecule in mouse and human cancers and proposes new, complementary strategies designed around this target for cancer treatment.

Highlights:

- Determined that tumour CD155 expression restricts the efficacy of immune checkpoint blockade in human melanoma and non-small-cell lung carcinoma.
- Demonstrated the prognostic value of IL-18 levels in the bone marrow in human multiple myeloma and the role of IL-18 in disease development.
- Determined the mechanism of action of new anti-mouse and anti-human CD39 antibodies in cancer.
- Determined that the immune checkpoint TIGIT is a new target in multiple myeloma.

Immunopathology

Team Head: Kate Gartlan

The Immunopathology Laboratory is focused on understanding the cellular and molecular mechanisms that drive immune-mediated pathologies. The group's recent focus has been on adaptive immune polarisation following allogeneic stem cell transplantation and its influence on graft-versus-host disease (GVHD). Donor stem cell transplantation is an important curative therapy in the treatment of blood cancers; however, its application is limited by serious complications such as GVHD that have a significant impact on patient mortality and quality of life. Early inflammatory responses during preparative transplant conditioning initiate a cascade of adaptive immune responses that manifest as acute and/or chronic tissue damage in more than half of transplant recipients. GVHD treatment options are relatively limited and focused on immunosuppression and steroidal therapy, which are problematic due to opportunistic infection and refractory disease. Therefore new therapies are urgently needed.

Highlight:

- Established the Immunopathology Laboratory.

Medical Genomics

Group Leader: Nic Waddell

Coordinator, Cancer Program

Genomics allows researchers to study a person's entire genome. The Medical Genomics Group uses computational techniques to analyse large amounts of genomic data to learn about disease and find better ways to treat or diagnose patients.

This group is collaborating on a variety of cancer genomics projects to provide the computational analysis. These studies include the melanoma International Cancer Genome Consortia project, a national whole genome mesothelioma project, and a familial breast cancer project.

The group has also been working in the Australian Genomics ICCon Partnership research project, which is performing whole genome sequencing of patients from families with cancer to find the underlying germline variant. Members of the Medical Genomics team are also working with the Queensland Genomics Health Alliance on research into the ethical, legal and social implications of genomic testing.

Molecular Cancer Epidemiology

Group Leader: Amanda Spurdle

The Molecular Cancer Epidemiology Group has been active in developing and applying methods to determine the clinical significance of multiple different cancer predisposition genes. The group has also applied various methods to assess the relevance of epidemiological/environmental factors to the development of endometrial cancer. This is in order to provide more concrete advice about potential preventative strategies for cancer in Queensland and the wider community.

Highlights:

- Introduced a scheme for multi-tier reporting of genetic test results that can designate clinical management strategies for both high and moderate risk variants, and also accommodate their relevance to therapeutic interventions.
- Contributed to the introduction of the BRCA Exchange web portal to advance interpretation of BRCA1 and BRCA2 variants.
- Provided evidence to select and apply bioinformatic tools for TP53 variant interpretation.
- Developed a tool that can significantly advance prediction of variant effect in analysis of large-scale sequence data. This is a plugin for the Ensembl Variant Effect Predictor that uses MaxEntScan to predict variant spliceogenicity.
- Demonstrated genetic overlap between endometriosis and endometrial cancer from cross-disease genetic correlation and GWAS meta-analyses.

Oncogenomics

Senior Scientist: Nick Hayward

The Oncogenomics Laboratory has continued its whole-genome sequencing of each of the main histological subtypes of melanoma – namely cutaneous, uveal, acral and mucosal – in order to better understand the mutations and chromosomal changes underlying the development of these tumours.

To further characterise the cellular pathways that are disrupted in cutaneous and uveal melanoma development, the group has generated cell lines carrying some of the important oncogenic driver mutations for these distinct melanoma subtypes. This enables assessment of the key signals promoting uncontrolled growth of the tumour cells. This in turn allows the identification of potential new therapeutic targets to treat melanoma, particularly through exploring genetic dependencies, as well as increasing understanding of the role genetic mutations play in drug-resistance mechanisms in late-stage melanoma.

The Oncogenomics Laboratory has conducted whole-genome sequencing or exome sequencing of families with a high density of cutaneous or uveal melanoma cases to identify novel susceptibility genes for these melanoma subtypes.

Highlights:

- Showed that uveal melanoma patients with germline MBD4 truncating mutations should respond favourably to treatment with immune checkpoint inhibitors.
- Led the first comprehensive study of the clinical phenotype of germline BAP1 variant-carrying families worldwide.
- Contributed to a study that identified novel pleiotropic risk loci for melanoma and naevus density.
- Participated in the first whole-genome sequencing study of melanocytic naevi.

Oncology and Cellular Immunology

Team Head: Tobias Bald

The Oncology and Cellular Immunology Laboratory aims to understand immune cell interactions in tumours. This knowledge is fundamental in order to develop novel and improve existing cancer therapies. In the last year, this group has investigated how T cells can affect the function of another type of immune cell called neutrophils. T cells, also known as killer T cells, are able to find and destroy cancer cells, and are the most important type of cell in the body for fighting cancer. Neutrophils are very important in wound healing and they have been shown to inhibit T cells from killing cancer cells. The group can now show that T cells produce factors that change the function of neutrophils. After neutrophils have encountered an environment with T cells, they become immune suppressive and inhibit T cells. This group therefore believes that targeting neutrophils in cancer is a novel and important strategy.

Highlights:

- Showed that T cells induce an immune-suppressive phenotype in neutrophils.
- Performed single-cell RNA sequencing of innate immune cells.

Personalised Medicine

Team Head: Fares Al-Ejeh

The Personalised Medicine Laboratory conducts inter-disciplinary, translational research in cancer, particularly breast cancer. This group's research spans cancer biomarker identification and validation using samples from patients, pre-clinical research to understand cancer biology, and identifying therapeutic opportunities towards clinical translation.

Highlights:

- Discovered a variant form of a kinase which is involved in pathogenic behaviour of breast and other cancers. A patent is underway to develop this as a biomarker and possibly therapeutic target.
- Identified novel genes that make chemotherapy more effective at lower doses in breast cancer cells in the lab. These genes present possible targets to develop pre-clinically, then clinically, to reduce the side effects of chemotherapy while improving its efficacy in patients.

Precision and Systems Biomedicine

Group Leader: Michelle Hill

The Precision and Systems Biomedicine Laboratory continues to progress the validation of blood markers for early detection of cancers of poor outcome, aiming to improve survival through earlier detection. In addition, the team has developed novel methods to detect molecular changes in fat, and to determine how these specific changes might impact on the development of disease. The translational focus of this work is to understand obesity-associated disease mechanisms and allow prevention measures to be developed.

Highlights:

- Progressed towards a blood test that can detect oesophageal adenocarcinoma at early stages, publishing the world-first results for independent validation in Australian and US cohorts.
- Released an update of raft proteome database RaftProt V2 in the prestigious journal *Nucleic Acids Research*. This is a unique, open-source resource for research into protein composition of membrane microdomains.
- Conducted an international collaborative study to determine glycosylation changes in oesophageal cancer biomarker protein.
- Discovered fundamental mechanisms of membrane lipids in mediating cancer spreading by modulating cellular messengers called exosomes that are released from cancer cells.

Sid Faithfull Brain Cancer Laboratory

Group Leader: Bryan Day

The Sid Faithfull Brain Cancer Laboratory studies the most common and aggressive form of adult brain cancer, glioblastoma (GBM); the most common brain cancer in children, medulloblastoma; and the rare and incurable paediatric brain stem cancer, diffuse intrinsic pontine glioma. The focus of this group's research is understanding the molecular mechanisms that are responsible for the initiation and recurrence of brain cancers and developing and testing new and effective therapies to treat these aggressive diseases.

The group's current research projects include:

- defining Eph receptors as therapeutic targets in brain cancer
- defining novel therapies for the treatment of brain cancer
- understanding intra-tumoural heterogeneity and inter-clonal cooperativity in brain cancer
- exploring the use of antibody drug conjugates (ADCs) and organoid cultures in the treatment of brain cancer
- developing a brain cancer tissue and culture bank.

Highlights:

- A clinical trial of the anti-EphA3 mAb (Ifabotuzumab) in patients with recurrent GBM commenced in Brisbane. The Melbourne branch of the trial is ongoing.
- Awarded a position on the Directorship of the Children's Hospital Foundation's Centre for Child and Adolescent Brain Cancer Research.
- Continued to successfully develop a high-grade brain cancer bank at QIMR Berghofer.

Signal Transduction

Group Leader: Kum Kum Khanna

Deputy Coordinator, Cell and Molecular Biology Department

The Signal Transduction Laboratory researches the DNA damage response (DDR) pathway that is essential for survival of all organisms. Defects in DDR are the cause of many diseases, including cancer. This group's work is to understand how its dysregulation leads to development and progression of cancer and to provide the basis for translation to the clinic. An example of the relevance of this work is the description of intrinsic differences in DDR between cancer stem cells (CSC) and other cells. This points to an explanation of the reason for the survival of CSCs after therapies, and hence, their role in promoting metastases. The group is addressing this gap through the discovery of critical mediator of CSCs radio resistance.

The laboratory also focuses on triple-negative breast cancer (TNBC), which relapses frequently and is resistant to treatment. More than 90 per cent of TNBCs carry mutations in tumor suppressor p53. The group has identified novel compounds to target p53-mutation cancers, which are currently being tested in pre-clinical models.

In addition to cancer, DDR is also of great relevance to other diseases. The Signal Transduction Laboratory is applying its expertise to understanding the role of DDR in maintenance of normal tissue homeostasis.

Highlights:

- Found that Cep55 regulates survival mechanisms to allow propagation of aneuploid cells.
- Discovered that inhibiting JAK2 leads to activation of adaptive resistance mechanisms mediated by activation of PDGFR-beta.
- Discovered that over-expression of Cep55 results in progressive germ cell loss in mice and causes a phenotype similar to that seen in many azoospermic men.

Statistics Unit

Group Leader: Gunter Hartel

The Statistics Unit's mission is to support QIMR Berghofer researchers and clinicians with statistical advice, consulting, training and collaboration. The unit also supports clinicians and researchers from the Metro North Hospital and Health Service and Mater Research. The Statistics Unit includes 12 full- and part-time statisticians with a range of different experience. The unit delivers its mission through one-on-one consultation with researchers to help them develop research proposals, funding applications and analysis plans, as well as conducting statistical analyses, writing reports, co-authoring publications and collaborating on research grants. Additionally, the unit delivers an annual, introductory statistics workshop that is available to all staff, as well as more targeted training sessions for specific groups. The Statistics Unit also works with IT to provide statistical analysis software to QIMR Berghofer staff, as well as training and advice to help researchers understand their own data. The unit also serves as an incubator for new statisticians to develop their talents and gain experience in applying statistics to medical research.

Highlights:

- Continued to collaborate with the Human Malaria Modeling Unit, resulting in multiple high-profile publications and invitations to present at international conferences.
- Received authorship on 78 peer-reviewed publications.
- Were named investigators on nine ongoing research grants, including two new grants.
- Provided statistical advice to more than 40 grant applications.
- Increased Metro North Hospital and Health Service and Mater Research consulting grants and output.

Translational Cancer Immunotherapy

Team Head: Siok Tey

This group's focus is translating basic immunology research into clinical application in the field of cancer immunotherapy and bone marrow transplantation. The Translational Cancer Immunotherapy Laboratory is particularly interested in developing and testing new cell therapy technologies. In the past 12 months, the group has developed a method to isolate, purify and expand a type of immune cell known as a regulatory T cell (Treg), which is a promising therapy for a debilitating complication of bone marrow transplantation, known as graft-versus-host disease. This group's ongoing work will scale up this technology for future phase I clinical trials.

The Translational Cancer Immunotherapy Laboratory has also started working on Chimeric Antigen Receptor (CAR) T cells. CAR T cell technology represents a major breakthrough in cancer therapy, with remarkable responses seen in patients with otherwise-resistant leukaemia. The group is currently working on this technology to make it more effective and hopes that its 'home-grown' platform will make this life-saving technology more accessible and affordable to Australian patients.

The group is also actively working on basic science research to drive future translational work. This includes studies on the how virus infection can strengthen immunity against leukaemia and the changes in gene expression during immune cell maturation.

Highlights:

- Developed a clinically applicable method to isolate regulatory T cells (Tregs) at high purity.
- Developed a method to genetically modify Tregs, which enables them to be tracked in future phase I clinical trials.

- Completed single cell RNA sequencing of natural killer (NK) cells following bone marrow transplantation to understand the changes in gene expression during maturation.
- Established a mouse model to study the impact of cytomegalovirus infection on leukaemia relapse following bone marrow transplantation.

Transplant Immunology

Team Head: Antiopi Varelias

Haematological malignancies – such as leukaemia, lymphoma and myeloma – account for approximately 10 per cent of all cancers and approximately 11 per cent of cancer deaths in Australia. Stem cell / bone marrow transplantation is the predominant curative therapy for these conditions. The major and limiting complication is graft-versus-host disease (GVHD) in which the gastrointestinal tract, skin, lung and liver are preferentially damaged by the transplanted immune system, limiting the therapeutic potential of this treatment. Given the severe immunosuppression in these patients, infections are common and can be fatal. Thus, there is a need for new treatment approaches to improve transplant outcome for patients. The Transplantation Immunology Laboratory seeks to understand the pathophysiology of GVHD in pre-clinical models with a view to translating these findings into clinical practice. The group's research focuses on understanding the immunological basis that underpins GVHD, with an emphasis on cellular and cytokine biology and the relationship with the microbiome/metabolome during transplantation.

Highlight:

- Established the Transplant Immunology Laboratory

Tumour Immunology

Senior Scientist: Rajiv Khanna
Deputy Coordinator, Immunology Department

The primary focus of the Tumour Immunology Research Group has been human immune regulation. The group's major goal is to obtain a deeper understanding of the mechanisms by which the human immune response to viral infections and human cancers may be generated, augmented and applied to the treatment of these diseases.

Highlights:

- Successfully completed a world-first clinical trial of adoptive immunotherapy for progressive multiple sclerosis.
- Successfully completed a phase I clinical trial of autologous T cell therapy for the treatment of cytomegalovirus (CMV) reactivation and disease after transplantation.
- Developed a novel human monoclonal-antibody-based therapy for Epstein-Barr-virus-associated lymphoma and acute infection.
- Successfully completed recruitment to assess the safety of autologous CMV-specific T cells as an adjuvant therapy for primary glioblastoma multiforme.

Tumour Microenvironment

Group Leader: Andreas Moller

The Tumour Microenvironment Laboratory focuses on how specific processes between cancer cells and surrounding non-tumour stromal cells influence carcinogenesis and its metastasis to distant organs. The group aims to understand how low oxygen (hypoxic) environments and other stress conditions change the physiology between tumour cells and stromal cell lineages. The group also aims to understand the role of hypoxia in generating receptive secondary metastatic sites (pre-metastatic niches).

Highlight:

- Developed a blood-based biomarker to prognosticate outcomes for cancer patients.

Infectious Diseases Program

Head: Professor James Mccarthy

Infectious diseases claim millions of lives each year across the globe. They are caused by pathogenic organisms, including viruses, bacteria and parasites. The research groups in QIMR Berghofer's Infectious Diseases Program are studying how these organisms cause illness, searching for better ways to diagnose and treat the diseases they cause, and developing vaccines and education strategies to prevent infections. These research groups have a strong focus on diseases that disproportionately affect developing countries and tropical regions.

QIMR Berghofer's Infectious Diseases Program includes research into viruses (including human immunodeficiency virus (HIV), cytomegalovirus, Epstein-Barr virus and mosquito-borne viruses), bacteria (including streptococci) and parasites (including malaria, intestinal protozoa and scabies). The program has a strong focus on collaborations with clinicians and pharmaceutical companies.

QIMR Berghofer is a founding member of the Queensland Tropical Health Alliance (QTHA), which is designed to enhance collaborations and networking in the field of tropical health. The Institute is also a founding member of the Australian Infectious Diseases Research Centre (AID), which supports research into diseases such as malaria, dengue fever and schistosomiasis.

AMI Laboratory

Group Leader: Qin Cheng

The Army Malaria Institute (AMI) Laboratory, established to consolidate close research collaborations between QIMR Berghofer and the Australian Defence Force, focuses on malaria research and investigates biological and molecular changes that make parasites difficult to detect and more resistant to anti-malarial drugs. The laboratory's research focuses on the investigation of biological and molecular changes to malaria parasites that make them difficult to detect and resistant to anti-malarial drugs, and the epidemiological surveillance of these parasites. Major activities include:

- surveillance of mutant malaria parasites that are undetectable by common rapid diagnostic tests to inform diagnostic and case management policy
- surveillance of drug-resistant malaria parasites to inform treatment policy
- characterisation of artemisinin-induced dormant parasites in humans to optimise treatments
- investigation of CYP2D6 profile and its relationship with risks of malaria relapses in Australian Defence Force members.

Highlights:

- Investigated causes of false negative malaria test results in Eritrea and revealed a high prevalence of mutant malaria parasites causing a high rate of false-negative malaria test results in the country.
- Conducted a baseline molecular investigation on artemisinin resistance in parasites collected from three Pacific countries (PNG, Solomon Islands and Vanuatu) prior to the introduction of artemisinin drugs and reported limited sequence polymorphisms, but not artemisinin-resistant mutations in the artemisinin resistance gene of the parasite populations.
- Characterised artemisinin-induced dormant parasites in clinical trial participants and demonstrated for the first time the presence of artemisinin-induced dormant parasites and evidence for these dormant parasites causing relapse of symptoms.
- Investigated the profile of CYP2D6 in ADF personnel deployed to PNG and East Timor and demonstrated that adherence to treatment and treatment dosing, rather than CYP2D6 profile, were the major contributors to malaria relapses in the ADF cohort studied.

Cellular Immunology

Group Leader: Scott Burrows

The Cellular Immunology Group is investigating killer T cells of the immune system, which control viral infection. It is already known that killer T cells recognise virus-infected cells via T cell receptors (TCRs). The group's work this year has been aimed towards the development of new approaches for treating virus-associated malignancies using gene therapy with virus-specific TCRs. The group has shown that gene therapy with TCRs that recognise Epstein-Barr virus can be used to kill virus-infected cells. The group has lodged a provisional patent for this technology and has secured a commercial partner to work with to further develop this technology towards clinical trials in humans.

Highlights:

- Developed a new method to treat malignancies associated with Epstein-Barr virus.
- Showed that gene therapy with T cell receptors that recognise Epstein-Barr virus can be used to kill virus-infected cells.
- Identified peptide mimics for influenza vaccination using non-natural combinatorial chemistry.
- Showed that the antibody response to common human viruses is shaped by genetic factors.

Clinical Tropical Medicine

Senior Scientist: James McCarthy

Head, Infectious Diseases Program

The focus of the Clinical Tropical Medicine Laboratory is on the development and application of clinical trial systems entailing experimental human malaria infection. The laboratory uses the Induced Blood Stage Malaria (IBSM) model, a type of volunteer-infection study to test new anti-malarial drugs and vaccines. Apart from malaria, the laboratory also worked on a number of other tropical diseases. In the last year the laboratory:

- Studied how well the first line of treatment of malaria clears malaria parasites from the blood of volunteers infected with drug-resistant or drug-sensitive parasites. In this study the group also evaluated the transmission of malaria from study volunteers to mosquitoes, and investigated the viability of parasites after exposure to drugs. These studies have provided valuable insight into how to assist the elimination of malaria.
- Completed one and began a second clinical trial of two new anti-malarial drugs, aiming to test their safety and efficacy. Both studies are sponsored by pharmaceutical companies.
- Completed a study testing how well two anti-malarial drugs work combination.
- Worked with the Haematology Department of Royal Brisbane and Women's Hospital to test if apheresis can be used to remove parasites from the blood of subjects.
- Completed a clinical trial testing an irradiated larval vaccine for prevention of human hookworm infection.
- Developed a sensitive diagnostic test for scabies using a DNA amplification method.

Highlights:

- Discovered that it is possible to test for cure of artemisinin resistance in clinical trials.
- Showed that it is possible to study malaria transmission from humans to mosquitoes.
- Demonstrated that it is possible to test a genetically attenuated malaria parasite in humans.
- Found that the drug tafenoquine protects people from catching malaria.

HIV Molecular Virology

Group Leader: David Harrich

The Molecular Virology Group's research has focused on the development of new treatments for dengue virus and human immunodeficiency virus type 1 (HIV-1) infections.

The dengue virus is spread by mosquitoes and causes more than 100 million clinical infections and 25 000 deaths each year. To reduce infections, the group has developed a new anti-dengue agent based on defective interfering particles (DIPs). DIPs are a synthetic virus that cannot cause disease, but are highly effective at controlling dengue virus growth in cells. The group has developed a system to mass-produce DIPs in order to undertake pre-clinical trials.

While therapies to treat HIV-1 infection are widely available, there is no cure for HIV infection and the identification of new multi-drug resistant HIV-1 strains has raised concern. The group has advanced two new antivirals to combat HIV-1 infection. One of them is an anti-HIV protein called Nullbasic and their recent humanised mouse model of HIV-1 infection showed that it can control HIV-1 infection. The second agent is a small compound that has a completely new mechanism of action that can inhibit drug-resistant HIV-1.

Highlights:

- Found that HIV-1 viral DNA synthesis requires interaction between the viral enzyme reverse transcriptase and the cellular protein eEF1A, which can be blocked by small drugs that can be developed into an entirely new class of anti-HIV drug.
- Demonstrated that a small compound, an oxazole-derivative, inhibits HIV-1 replication, including drug-resistant virus.
- Showed that DIPs produced by a stable cell production system inhibit dengue virus replication in vitro.
- Showed that eEF1A demonstrates paralog specific effects on HIV-1 reverse transcription efficiency.
- Discovered that a gene therapy using Nullbasic controls virus growth in a humanised mouse model of HIV-1 infection.

Human Malaria Immunology

Team Head: Michelle Boyle

The Human Malaria Immunology Group is focused on understanding how humans develop immunity to malaria. The team is working on understanding antibody development and identifying cellular responses that support antibody induction. They use human cohorts to study these responses in a number of malaria transmission settings, including volunteer infection trials, observational cohorts from Uganda and PNG, and drug intervention cohorts from Malaysia and Indonesia. The group is applying technologies, such as advanced flow cytometry and single-cell RNA sequencing, to identify cellular subsets that can be targeted to improve malaria vaccines.

Highlights:

- Discovered that parasite-specific IgM can block parasite replication and protect from malaria in humans.
- Identified a subset of T-follicular helper cells that are associated with antibody induction following malaria infection.
- Quantified the diversity of T-follicular helper cells in human malaria infection with single cell RNA sequencing.

Immunology and Infection

Group Leader: Christian Engwerda

The Immunology and Infection Laboratory aims to define the immunoregulatory mechanisms employed by CD4+ T cells during parasitic diseases. The group used pre-clinical and clinical malaria and visceral leishmaniasis (VL) samples to generate unique data sets to identify new immune molecules that can be targeted to improve human health. The group has identified new clinical targets that can be manipulated for therapeutic advantage during infection, cancer and autoimmunity. They are now investigating whether they can re-purpose existing drugs to target the molecules they have discovered, as well as generating and testing new therapeutics. The group will identify drugs to improve outcomes in a broad range of inflammatory diseases, as well as continue to test if these drugs can be employed to improve vaccines and/or drug treatment in malaria or leishmaniasis.

Highlights:

- Discovered that the inflammatory molecule NKG7 is an important mediator of inflammation during infectious diseases, cancer and colitis.
- Demonstrated that the activity of NKG7 can be modulated for clinical advantage in colitis, cancer, malaria and leishmaniasis.
- Discovered a licensed drug called ruxolitinib can be used to block type I interferon signaling in malaria and visceral leishmaniasis and improve anti-parasitic CD4+ T cell responses.
- Identified the DNA sensing molecule STING as an important regulator of T cell functions in malaria.
- Discovered that blocking glycolysis could prevent development of pathology without compromising anti-parasitic immunity in visceral leishmaniasis.

Inflammation Biology

Group Leader: Andreas Suhrbier

The Inflammation Biology Group has focused on developing knowledge and interventions for two emerging mosquito-transmitted viruses of international concern. Chikungunya virus (CHIKV) is related to Ross River virus and has recently caused more than 10 million cases of arthritic disease globally. Zika virus (ZIKV) causes congenital Zika syndrome (CZS), a spectrum of primarily brain defects in newborn babies, recently particularly prominent in Brazil. The group has completed pre-clinical studies of a new SCV-ZIKA/CHIK vaccine (Sementis Ltd), which they hope will enter human clinical trials next year. The group has also developed new technologies that allow them to ask why African Zika virus strains are not associated with CZS. So far the data support the notion that African Zika virus strains are actually more virulent, causing miscarriage and thereby preventing the birth of viable babies with CZS. Finally, the group has come to realise that arguably the most dangerous animal in the world, the *Aedes aegypti* mosquito (which transmits ZIKV, CHIK and dengue), is itself infected with many viruses that are likely to determine how well these mosquitoes can transmit viruses to humans. The research team continues to undertake industry-funded collaborative R&D with Australian biotech and international pharma.

Highlights:

- Demonstrated that a new vaccinia-based, replication-defective poxvirus vector system (Sementis Copenhagen Vector), co-expressing Zika virus and chikungunya virus structural proteins, is fully protective in pre-clinical models.
- Showed that the *Aedes aegypti* mosquito is itself infected with many insect-specific viruses that are likely to influence how well the mosquito can transmit dengue, Zika, chikungunya, etc.

- Using a new technology that allows researchers to generate de novo any Zika virus strain, showed that even virus strains not associated with Congenital Zika Syndrome in humans can efficiently infect foetal brains in pre-clinical models.
- Illustrated that a human clinical trial published in *The Lancet* in 2006 on the therapeutic efficacy and safety of chaperonin 10 in patients with rheumatoid arthritis, was likely due to endotoxin contamination leading to endotoxin tolerance.

Lung Bacteria

Group Leader: Scott Bell

The Lung Bacteria Group studies pathways for acquiring and transmitting respiratory infection between people with lung diseases. This group also studies ways to reduce the risk of infection being acquired and transferred between people.

Highlights:

- Demonstrated that face masks remain effective in preventing infection and are well tolerated for clinically relevant periods in people with cystic fibrosis (CF) attending hospital.
- Showed that the increasingly common non-tuberculous mycobacteria infection can cause infection in people with CF.
- Found that strains that infect patients are closely related to those found in the natural environment, highlighting the need to develop improved approaches to reduce the risk of infection.
- Found that types of non-tuberculous mycobacterial infection in CF (*Mycobacterium abscessus*) are more common in children than adults.

Malaria Immunology

Group Leader: Ashraful Haque

Coordinator, Infectious Diseases Program

The Malaria Immunology Group employs state-of-the-art, single-cell genomics technologies in a variety of systems – including experimental animal models and human clinical samples – to help understand the biology of malaria and the adverse effects of bone marrow transplantation and cancer. In addition, the group has focused on the disease malaria by examining how anti-malarial drugs and the immune system can best control parasite numbers.

Highlight:

- Discovered how parasite-specific antibodies act in the body to limit malaria parasite numbers.

Malaria Pathophysiology

Team Head: Bridget Barber

The newly established Malaria Pathophysiology Group studies the emergence of zoonotic *knowlesi* malaria, as Malaysia approaches elimination of the human-only malaria species. In addition, the group is investigating comparative pathophysiological mechanisms of disease from severe malaria from *falciparum*, *vivax* and *knowlesi* malaria, with a focus on microvascular pathology, and with the aim of identifying targets for adjunctive treatment.

Molecular Immunology

Group Leader: Michelle Wykes

The Molecular Immunology Laboratory is focused on investigating the role of immune checkpoint inhibitors, especially the PD-1 pathway, in the immune system's protecting against malaria and cancer. The group is working on three main projects with the aim of developing new immunotherapies and experiments. The group is also investigating the pathogenesis of malaria and is working to develop new treatments for this disease, which will be relevant to other diseases.

Highlights:

- Developed a human antibody for commercialisation.
- Secured funding to develop a second product.

Molecular Parasitology

Senior Scientist: Don McManus

The Molecular Parasitology Group continued investigating schistosomiasis and echinococcosis (two of the most insidious helminth zoonoses) and intestinal worm infections. This group's research vision espouses a complementary approach bringing together field practicalities and technical innovation to develop new workable and effective control strategies. This underpins the team's firm commitment to complement pioneering laboratory research with stringently applied field techniques and development of practical, effective interventions that are powerful weapons against the tenacity of parasites – one prime example being the development and testing of an acclaimed health education package, *Magic Glasses*, targeting worms in school children in China, Philippines and Vietnam in 2018–2019. The group continued to develop new public health interventions, including vaccines, and new diagnostic procedures against these diseases that will lead to their elimination. They also sequenced the genomes of several parasitic worms (*Taenia multiceps, Paragonimus* and *Schistosoma bovis),* information critical for the development of future clinical treatments. As there is a lack of suitable tools to characterise the function of the gene products of these flatworms as potential intervention targets, the group embarked on an exciting new project establishing novel ways of investigating schistosome transgenesis and the utility of CRISPR/Cas9-based genome editing for undertaking functional genomics studies targeting schistosomes.

Highlights:

- A published paper was recommended by F1000Prime, a post-publication peer-review service that highlights the most interesting articles published in the biomedical sciences based on the recommendations of a faculty of more than 8000 leading experts.

- Published a definitive review on Schistosomiasis in *Nature Reviews Disease Primers*.
- Obtained the complete genome sequence of the oriental lung fluke, *Paragonimus westermani*.
- Obtained the whole-genome sequence of the bovine blood fluke, *Schistosoma bovis*, which supports interspecific hybridisation with *S. haematobium*.
- Defined circulating miRNAs as footprints for liver fibrosis grading in schistosomiasis.

Mosquito Control

Group Leader: Greg Devine

The Mosquito Control Group continues to explore the new insecticidal vector control paradigms of 'auto-dissemination' and 'spatial repellents' in Europe, the Americas and Asia. The group has made significant inroads into the exploitation of mosquito genomics for identifying vector control targets and population dynamics. The group has continued to work with USAID and UK MRC to define the utility of Near Infra Red Spectroscopy to characterise key entomological traits such as age and infection.The group continues to chair and host the Mosquito and Arbovirus Research Committee, which advises Queensland Health and local government on matters of vector surveillance and control. The team works with state and federal governments on the costs and public health risks of exotic mosquito invasions and on the ecology and epidemiology of Ross River virus. The group also works to understand the evolution and transmission of defective interfering particles, a potential new focus for dengue therapeutic agents. Work has begun on a citizen science initiative for the surveillance and control of mosquito-borne diseases.

Highlights:

- Joined a global network working on *Aedes aegypti* genomics, which may lead to opportunities for partnerships, grants and new targets for control.
- Initiated and led urban trials on new spatial repellent insecticides in Mexico.
- Demonstrated usefulness of endectocidal treatment of pigs as a complementary tool for combating malaria transmission in PNG.
- Demonstrated the effectiveness of auto-dissemination as an *Aedes* control tool in urban environments.
- Described *Aedes aegypti* genomes, which may lead to new targets for control.
- Described vector competence of Australian *Aedes aegypti* and *Aedes albopictus* for an epidemic strain of Zika virus.

Scabies

Group Leader: Katja Fischer

Scabies is an infectious disease caused by parasitic mites. It affects millions of people worldwide and, importantly, a high percentage of Aboriginal and Torres Strait Islander people in remote northern Australia. Scabies is listed by the World Health Organization as a neglected tropical disease (NTD) and is inextricably linked to extremely high rates of pyoderma, chronic rheumatic heart and kidney diseases, invasive streptococcal and staphylococcal sepsis and, thus, represents a huge, persistent public health burden.

The Scabies Group uses cutting-edge molecular and bioinformatic methods to generate crucial high-quality, integrated molecular databases to identify new drug and diagnostic targets and translate these into clinical trials and practice. The group analyses the diversity and dynamics of the microbiota associated with scabies and the molecular mechanisms that underpin the synergy between mite and bacteria against host defence to provide the basis for improved treatment and management strategies.

Highlights:

- Assembled and annotated the scabies mite genome, proteome and transcriptome databases.
- Analysed the scabies mite associated microbiota.
- Undertook in vitro and in vivo testing of new scabicide candidates in collaboration with commercial partners.

Translational and Human Immunology

Team Head: Corey Smith

The Translational and Human Immunology Group focuses on developing new immunotherapy approaches for both cancer and viral infections. In collaboration with the Tumour Immunology Laboratory, the group completed phase I clinical studies in multiple sclerosis and transplant patients with viral disease. The group has also developed new platforms for immunological monitoring of immunity following T cells therapy and for assessing the potency of cell therapy projects. Additional work has focused on understanding immune defects in transplant patients that increase the risk of developing viral disease.

Highlights:

- Completed a first-in-human clinical study of cell therapy in solid organ transplant patients.
- Completed a first-in-human study of Epstein-Barr-virus-specific cell therapy for multiple sclerosis patients.
- Developed immune-monitoring approaches to monitor T cell reconstitution following cell therapy.
- Identified new targets for immunotherapy in patients with the brain cancer, glioblastoma (GBM).

Mental Health Program

Acting Head: Professor Sarah Medland

QIMR Berghofer's Mental Health Program focuses on a range of conditions that arise from an interaction of genetic and complex environmental influences, such as Alzheimer's disease, dementia, depression, anxiety, bipolar disorder, schizophrenia, epilepsy and anorexia nervosa.

The Mental Health Program combines QIMR Berghofer's existing expertise in genetics and population health with new techniques in neurosciences. The teams have strengths in the clinical aspects of mood disorders, which are complemented by their ability to use genetic, imaging and computational approaches to understand these debilitating disorders. This approach promises earlier and more accurate diagnosis of mental disorders and personalised therapies based on improved knowledge of pathophysiology and empirically validated clinical and/or biological phenotypes.

The Institute's mental health researchers have comprehensively mapped the connections in the healthy elderly brain, laying the groundwork for new research into Alzheimer's disease and dementia, and are using cutting-edge imaging and information technology to develop a diagnostic test for major depressive disorders.

Brain Modelling Group

Team Head: James Roberts

The Brain Modelling Group works on modelling and analysing brain structure and dynamics in health and disease. The group is following two major themes: developing new diagnostic methods for infant brain health and modelling large-scale brain activity across the lifespan. In the last year the group has collated a large database of high-quality brain activity recordings from premature babies to develop a new growth chart for brain function, showing how the brain is developing, similar to how one tracks a baby's weight. On the modelling side, the group is harnessing the rapid developments in neuroimaging technology and connectomics to develop new mathematical models of brain activity. The team has provided the first explanation for large-scale brain waves that change dynamically over time. They have also developed the first model of infant sleep brain dynamics, and the first explanation for brain activity during recovery from hypoxia. The group applied its new brain network analysis tools to understand fundamental constraints on how the human brain evolved, and how its wiring can go wrong in schizophrenia.

Highlights:

- Developed the first whole-brain model that captures activity patterns such as cortical waves and metastability, and related these to underlying brain anatomy.
- Had a landmark paper showing how brain waves emerge from the human connectome accepted by *Nature Communications*.
- Collated one of the largest databases of high-quality pre-term brain activity recordings, a highly valuable research resource.
- Developed an accurate method for tracking 'brain age' in pre-term infants – essentially a growth chart for brain function.
- Published a paper in *Nature Neuroscience* applying novel brain network analysis tools to explain key features of brain evolution and the pathophysiology of schizophrenia.

Cellular and Molecular Neurodegeneration

Group Leader: Anthony White
Acting Coordinator, Mental Health Program

The Cellular and Molecular Neurodegeneration Group has built a platform to screen drugs for dementia and motor neuron disease using patient-derived microglia. This approach has shown that there are patient-specific changes to microglia function in people with brain disease, and some patients respond differently to each drug. This can form the basis for a personalised medicine approach to treating brain disorders that involve inflammation. The group has also generated human brain endothelial cells from people with Alzheimer's disease and compared them to control cells. The team has found important differences in the function of the Alzheimer's brain endothelial cells which may be associated with impaired blood brain barrier function in Alzheimer's disease. They have also shown that ultrasound therapy has different effects on Alzheimer's disease endothelial cells which may help with drug delivery. The team has also established 3D neural cell cultures and human brain organoids, in which they examining the effect of a complex 3D environment on microglia function and drug action.

Highlights:

- Generated a platform to screen new drugs for effect on microglia in brain diseases.
- Identified key differences between Alzheimer's disease and control brain endothelial cells.
- Generated 3D and brain organoid cultures containing patient microglia to understand complex disease and drug effects.
- Identified key differences in microglia function in patients with slow compared to rapidly progressing motor neuron disease.

Clinical Brain Networks

Team Head: Luca Cocchi

The Clinical Brain Networks Group is at the forefront of analysing brain networks in health and disease, and is expert in studying the perturbation of neural activity using non-invasive brain stimulation (NiBS). The group's research program focuses on:

- understanding the neural principles supporting the communication between remote brain regions (basic science)
- characterising whole-brain abnormalities underpinning psychiatric and neurological symptoms (clinical science)
- developing and testing new personalised interventions to normalise brain network activity supporting psychiatric and neurological symptoms (translational medicine).

Highlights:

- Successfully translated basic knowledge to the development of innovative therapeutic interventions, with a focus on normalising brain activity underpinning symptoms of psychiatric disorders.
- Led the development and application of novel analysis tools to model brain network activity.
- Led the development of a methodological framework to combine neuroimaging, mathematical modelling and brain stimulation to study neural principles supporting the communication between brain regions.
- Generated the first virtual atlas on the effects of local brain stimulation to the whole brain.

- Developed analysis tools facilitating the targeted clinical use of brain stimulation. These tools are used in three registered clinical trials.
- Led two major randomised control trials assessing the efficacy of personalised brain stimulation interventions to normalise brain network activity and reduce symptoms of obsessive-compulsive disorder.

Genetic Epidemiology

Senior Scientist: Nick Martin

The Genetic Epidemiology Group seeks to identify the particular genes involved in causing complex diseases. The group performs longitudinal studies with twins on a wide range of complex traits of medical and behavioural interest. Particular research over recent years has moved to genome-wide association studies (GWAS) to locate genes influencing complex traits, including anxiety, alcoholism and dizygotic (non-identical) twinning. Most recently, the laboratory initiated projects to recruit large patient samples for GWAS of anorexia and depression and also conducted research into the genetics of melanoma.

Highlights:

- Found that the risk of major depression was influenced significantly by the interaction between polygenic risk score for depression and environmental stress.
- Recruited more than 20 000 people who have suffered from depression and obtained saliva samples from them for DNA extraction and performed GWAS on more than 16 000.
- Participated in research that identified 102 significant gene loci for depression.
- Published the first eight gene loci for anorexia.
- Found five new gene loci for mole count and melanoma risk.
- In collaboration with the Psychiatric Genetics Group, launched the Australian Genetics of Bipolar Study, with more than 3000 saliva samples collected so far.

Neurogenomics

Team Head: Guy Barry

The Neurogenomics Laboratory investigates and validates genome-wide transcriptomic data to provide insight into how the human brain functions. For this, it employs cutting-edge technologies such as:

- induced pluripotent stem cells (iPSCs)
- next generation sequencing (NGS)
- advanced bioinformatic analyses.

Understanding how the human brain works has historically been restricted due to the lack of a suitable human model and the ability to interrogate the entire transcribed human genome. Recent innovations in iPSC technology have permitted an unprecedented view into the biology of human cellular function, as many cell types – including brain cells – can be derived from these ‘stem’ cells.

The emergence of powerful bioinformatic capabilities has advanced the field of genomics and transcriptomics over the last decade. Using a combination of iPSC and NGS technologies, the group is exploring how mRNAs, long non-coding RNAs and small RNAs combine to underpin human cognitive advancement, evolution and psychiatric disease.

Highlights:

- Published 10 papers during 2018–19, including a key paper relating to the understanding of how cannabis use may trigger schizophrenia and how our brain is able to pass on real-time heritable information.
- Found new genomic targets for the brain cancers, glioblastoma and medulloblastoma.
- Found inflammatory pathways critical for brain ageing.
- Initiated a large-scale investigation of possible metabolic interventions for schizophrenia.

Psychiatric Genetics

Group Leader: Sarah Medland
Acting Head, Mental Health Program

The Psychiatric Genetics Group uses statistical genetics and genetic epidemiological techniques to investigate the causes of mental health conditions and traits that impact on mental health. The group's current projects focus on examining the genetic architecture of the human brain structure, ADHD (attention deficit hyperactivity disorder), bipolar disorder, depression, schizophrenia, anorexia, borderline personality disorder and pregnancy-related conditions that impact on mental health. The group also works on developing models and strategies to translate genetic findings in the mental health domain, as translation within this field is expected to be different to other fields of medicine.

Highlights:

- Brought together researchers from around the world to work on the genome-wide association meta-analysis of more than 20 000 individuals diagnosed with ADHD and more than 35 000 controls, finding important new information about the underlying biology of ADHD.
- Recruited and phenotyped more than 4000 Australians with bipolar disorder to a large genetics study.
- Investigated the genetic architecture of the human cortex by performing the largest yet genome-wide association analyses of brain structures.
- Recieved funding to design a screening tool to identify women experiencing symptoms of post-traumatic stress disorder relating to pregnancy and childbirth.
- Discovered the first genome-wide significant risk loci for ADHD.

Systems Neuroscience

Senior Scientist: Michael Breakspear

The Systems Neuroscience Group uses brain imaging and computer modelling to understand a range of important diseases of the human brain. In the last year, the group has focused on the early brain changes that precede dementia and brain changes in healthy young Australians at future risk of bipolar disorder and depression.

In the field of dementia, the group has focused on identifying healthy Australians aged between 45 and 75 and studying the genetic, behavioural and brain imaging 'fingerprints' that predict risk of later dementia. This involves these participants volunteering for a series of cognitive tests and undertaking molecular and structural brain imaging scans.

More broadly, the group also looks at the influence of exercise and a healthy lifestyle on physical and emotional wellbeing, and the fundamental brain processes underlying complex decision-making tasks.

The Systems Neuroscience Group also studies schizophrenia, Parkinson's disease, epilepsy, attention deficit disorder and autism.

The head of the Systems Neuroscience Group, Professor Michael Breakspear, transferred to the University of Newcastle during the year but remains an honorary Senior Scientist at QIMR Berghofer.

Translational Neurogenomics

Group Leader: Eske Derks

The Translational Neurogenomics Laboratory investigates the role of genetic factors in a range of mental health disorders, including schizophrenia, substance use disorders, anxiety disorders and compulsive disorders. In the last year, 17 articles were published on genetic risk factors for a range of neuropsychiatric conditions, including substance use disorders, schizophrenia, depression, and obsessive compulsive disorder. The group addressed questions such as: Which genetic variants in the DNA increase the risk of developing a neuropsychiatric disease? What is the genetic overlap across different psychiatric disorders? What are the downstream molecular consequences underlying statistical genetic associations? Which existing drugs may be repurposed for prevention and treatment of neuropsychiatric diseases?

Highlights:

- Discovered 331 genes associated with the risk of schizophrenia, bipolar disorder, depression, or ADHD.
- Found 35 genes linked to cannabis use and improved understanding of the causal relations between cannabis use and schizophrenia.
- Played a leading role in the International Cannabis Consortium and contributed to the analysis of genetic profiles of more than 180 000 subjects to identify genetic variants associated with cannabis use.

Chronic Disorders Program

Head: Professor Greg Anderson

QIMR Berghofer is conducting research into a range of chronic disorders that affect people's quality of life and health prospects. These include asthma, eye disease, haemochromatosis, hepatic fibrosis, cystic fibrosis liver disease and inflammatory bowel disease. The incidence of some of these conditions is rising due to demographic and lifestyle changes and QIMR Berghofer is conducting research in this field in response to the community's changing needs.

The Institute's chronic disorders research groups are conducting wide-ranging investigations, including identifying the genetic variation associated with the risk of some of these disorders, as well as understanding the natural history of iron-related disorders.

Gut Health

Group Leader: Graham Radford-Smith

The Gut Health Group's major research focus is the link between objective and quantitative clinical and molecular data in subjects with gut disorders, including inflammatory bowel disease (Crohn's disease and ulcerative colitis) and colorectal cancer. The group focuses on understanding the underlying biology of gut health disorders and developing objective diagnostic support systems to aid in the timely diagnosis of disease. The group has developed novel systems to identify, extract and analyse longitudinal clinical (for example, symptoms, pulse rate, blood pressure, weight, height, waist circumference) and laboratory (blood test results – for example – blood count, liver function tests, fasting blood sugar, fasting lipids, iron studies, inflammatory markers) data on consented research subjects and seeks to determine the relationships between specific subgroups within these datasets and host genome, transcriptome, and metagenome. To this end, the group has generated extensive genotype data on both its Crohn's disease and ulcerative colitis populations, together with a detailed transcriptomic profile of both the small and large bowel. The group has published much of this work and more recently, published the results of laboratory data analysis and relationships between host genotype and microbiome. This will improve understanding of intestinal biology in the healthy and inflamed gut, and support the development of novel therapeutic approaches and diagnostic tools.

Highlights:

- Conducted a longitudinal analysis of blood test results on more than 1000 inflammatory bowel disease patients and identified a signature that can lead to a significantly earlier diagnosis of people with Crohn's disease in the community.
- Made a major, novel finding that links a genetic variant in the IL23 receptor gene to a healthy microbiome signature in the distal small bowel, and that helps to explain why this variant protects people from developing Crohn's disease.

Hepatic Fibrosis

Group Leader: Grant Ramm

Coordinator, Cell and Molecular Biology Department

Research in the Hepatic Fibrosis Group has focused on identifying non-invasive ways to detect liver disease and monitor liver disease severity in adults with hepatocellular carcinoma (primary liver cancer) and children with cystic fibrosis. In accomplishing this objective, the group has identified a number of mediators of hepatic inflammation and hepatic fibrosis that are now being investigated as targets for therapeutic intervention.

Highlights:

- Identified a serum microRNA panel that can detect and monitor liver disease severity in children with Cystic Fibrosis.
- Used the non-invasive ultrasound-based technology, transient elastography, to detect liver disease in children with Cystic Fibrosis.
- Identified a serum microRNA panel for the detection of hepatocellular carcinoma in patients with chronic hepatitis C virus infection.
- Demonstrated the ability of routinely available full blood count parameters to detect hereditary haemochromatosis.

Iron Metabolism

Group Leader: Greg Anderson

Head, Chronic Disorders Program

The Iron Metabolism Laboratory focuses on understanding the homeostasis of the essential trace element iron (and related metals), the natural history of iron-related disorders and potential therapies for treating them, and mechanisms of liver disease. Current research activities include:

- Elucidating the basic mechanisms of intestinal iron absorption and its regulation. Increased absorption characterises most iron loading disorders such as haemochromatosis and thalassaemia. Emphasis is being placed on the ferroportin/hephaestin iron transport complex and its modulation by the iron regulatory peptide, hepcidin.
- Exploring novel mechanisms of regulating iron intake in pregnancy and early postnatal life. These are times of high iron demand and this work has significant implications for maternal health, as well as infant nutrition and complementary feeding.
- Using new nanoparticle technology to develop better methods for delivering iron-removing agents. Target tissues for iron removal include the liver, brain and heart, as well as tumours.
- Studying the natural history of the iron loading disorder, hereditary haemochromatosis, and exploring markers for monitoring the effectiveness of treatment.
- Examining the mechanisms underlying hepatic encephalopathy, the neurophsychiatric syndrome that often accompanies severe liver disease. This work takes a broad approach from basic molecular mechanisms to clinical applications.

Highlights:

- Demonstrated that encapsulating the iron chelator, deferoxamine, within polymeric nanoparticles can enhance its efficiency as an iron chelator in murine models of iron loading disease by prolonging the half-life of the drug and enhancing its tissue penetration.
- Provided the first description of a patient with a mutation in the iron oxidase HEPHL1 (zyklopen) gene.
- Demonstrated that the targeted co-delivery of an iron chelator and a HIF-1alpha inhibitor using liposomes can provide an effective pancreatic cancer therapy in mice.

- Showed that the metal transporter, ferroportin, does not play a major role in body manganese homeostasis.
- Demonstrated that the iron oxidases, ceruloplasmin and hephaestin, modulate iron efflux in astrocytes and oligodendrocytes, respectively.

Lung Inflammation and Infection

Group Leader: David Reid

The Lung Inflammation and Infection Group is focused on lung diseases that are characterised by bacterial infections. The group is studying immune responses to bacteria and viruses in smoking-related chronic obstructive pulmonary disease (COPD) and the genetic disorder, cystic fibrosis (CF). Immune defences in the lung rely on a robust, innate and adaptive immune system. The group has found abnormalities in lung iron homeostasis in CF and COPD, which are important as bacteria require iron for replication and their enzyme systems. As part of this research, the group is targeting bacterial iron acquisition systems therapeutically. The group has also found that key innate T lymphocytes may not function normally in CF and COPD and is investigating this further, as innate T cells are needed for healthy defences against bacteria and viruses. A key component of the group's work is the identification of biomarkers in blood that may be used to guide antibiotic therapy in COPD and CF.

Highlights:

- Continued work on the role of abnormal lung iron homeostasis in cystic fibrosis.
- Progressed research into the lung microbiome.

Molecular Nutrition

Team Head: David Frazer

The Molecular Nutrition Laboratory studies the role of iron in health and disease. Its focus has been mainly on the factors regulating the iron regulatory molecule, hepcidin. Hepcidin is a peptide hormone that regulates dietary iron absorption and the release of iron from body tissues. The production of hepcidin is inappropriate in many pathological conditions, including the common iron-loading disorder, hereditary haemochromatosis. The group will continue it's research into hepcidin regulation with the aim of developing better treatments for the many conditions associated with disrupted iron levels.

Highlights:

- Found that the level of iron in the circulation was part of the signaling mechanism responsible for decreasing the production of the iron regulatory hormone, hepcidin, in response to an increase in red blood cell production.
- Demonstrated that the level of iron in the bloodstream is able to regulate the expression of hepcidin in response to stimulated erythropoiesis.
- Showed that fasting increases hepcidin production and that this effect is able to overcome the decrease in hepcidin expression that occurs in the iron overload disorder, hereditary haemochromatosis. This implies that targeting energy production pathways may provide new treatments for this disorder.

- Used nanotechnology to enhance the effectiveness of an iron chelator commonly used to treat iron loading disorders.
- Examined the role of multicopper ferroxidases in the regulation of systemic iron homeostasis.

Mucosal Immunology

Team Head: Severine Nevarro

The Mucosal Immunology Laboratory investigates immune regulation in order to understand how to control the inappropriate immune responses responsible for allergy and autoimmune diseases. The laboratory uses experimental, pre-clinical and computational approaches to develop new therapeutic strategies that translate into preventative or therapeutic interventions.

Highlights:

- Identified three new drug targets for the treatment of chronic inflammation.
- Initiated collaborations with RBWH-based clinicians to develop four independent projects.
- Co-founded the spin-out company, Paragen Bio, for the pre-clinical development of hookworm-based biologics for the treatment of irritable bowel disease.

Organoid Research

Group Leader: James Hudson

The Organoid Research Laboratory is focused on developing state-of-the art bioengineering approaches for human organoids. The laboratory uses its organoid platforms in-house, in collaboration with research partners, and together in industry partnerships for a variety of different basic science discovery applications and also applications focused on development for new therapeutics. Its current programs include understanding the mechanisms of cardiac maturation, interactions between different cell populations in the heart, discovery of new therapeutics for patients with heart failure and development of other organoid models.

Highlights:

- Used human cardiac organoids in a drug development pipeline to discover new drug candidates for cardiac regeneration, discovering two cardiac regeneration drug candidates.
- Discovered that the mevalonate pathway regulates heart growth, which has implications for clinical trial design.
- Discovered a drug candidate for diabetic cardiomyopathy.
- Generated skeletal muscle micro tissues with the ability for pacing to study exercise benefits and statin-induced myopathy.

Respiratory Immunology

Group Leader: Simon Phipps

The Respiratory Immunology Group seeks to understand the causal association between respiratory virus infections in early life and the later development of asthma. This year the group published a major article

elucidating a central role for the mediator, prostaglandin D2, in linking the two diseases. With this greater understanding of disease pathogenesis, DP2 antagonists, which block PGD2 from activating one of its receptors and are currently in phase III clinical trials, may be used in the future as a new therapeutic to prevent the onset of asthma.

Highlights:

- Co-organised the International Congress of Mucosal Immunology (ICMI), held in Brisbane.
- Published a paper in the journal *Science Translational Medicine* that demonstrated that DP2 antagonists may prove useful for the treatment of severe viral bronchiolitis in infancy and prevent the onset of asthma.
- Awarded an NHMRC Project grant to investigate the effect of maternal diet on microbiome and immune development in the offspring.
- Awarded an industry contract with Novartis to investigate the effects of DP2 antagonism on airway remodelling.
- Published papers in other prestigious peer-reviewed journals such as the *Journal of Allergy* and *Clinical Immunology.*

Statistical Genetics

Group Leader: Stuart MacGregor

Research in the Statistical Genetics Laboratory focuses on applying a range of statistical genetic methods to complex diseases. As well as identifying new inherited variants contributing to disease risk, the group has used genetic data to identify overlaps between various diseases and traits. In the specific case of a disease and a modifiable risk factor, the group has used genetic data in causal inference (work aiming to determine if a risk factor really causes that disease).

The group's work has continued to have two major disease foci: eye disease (glaucoma, myopia, macular degeneration) and cancer (melanoma, ovarian cancer, oesophageal cancer). Specifically, the group has mapped a large number of genes influencing the risk of eye disease. This work in eye disease is now being extended to allow gene-based risk predictions for glaucoma. In the future this should allow more efficient screening for the disease, reducing the number of Australians who go blind as result of glaucoma.

Highlights:

- Discovered 101 genes for intra-ocular pressure (85 of which were new), demonstrating that these genes had a large effect on a person's risk of glaucoma and that they could be used to improve predictions of who would and would not be affected by the disease.
- Demonstrated that having low vitamin D levels is unlikely to cause cancer.
- Showed that being overweight is causally related to increased cancer risk.
- Found that increasing one's fatty acid consumption has no effect on cancer risk.
- Showed that genetic information can improve prediction of who is at highest risk of melanoma.

Financial Review

Total comprehensive income in 2018–19 was a surplus of $13.8 million. This includes a net gain of $12.4m on the sale of a subsidiary operation, leaving an operating surplus of $1.4m after depreciation and amortisation of $12m. Competitive grant funding, donation income and commercial activities have all increased this financial year. Investment returns have also been favourable compared to budget, although are lower than 2017—18.

The Council's financial structure is mainly based on the management of operating, commercial and grant funds. Funding from competitive grants and commercial contracts spent on research in the 2018–19 financial year was $45.4 million (2017–18: $41.6 million), representing 38% (2017–18: 39%) of total income from continuing operations (excluding the sale of the subsidiary). A portion of the Council's operating funding is provided by a grant from Queensland Health of $18.9 million (2017–18: $18.9 million).

The Council's total funding resources, including amounts under management at 30 June 2019, totalled $175.1 million (2017–18: $156.8 million). The increase in funds held during the year was mainly due to the proceeds on the sale of the subsidiary and reinvestment of the returns on the funds invested.

The Council of the Queensland Institute of Medical Research Financial Statements 2018-2019

Contents

Statement of comprehensive income
For the year ended 30 June 2019

	Notes	2019 $'000	2018 $'000
Income from continuing operations			
Grants and other contributions	3	75,228	64,942
User charges and fees	4	30,165	26,467
Other revenue	5	12,537	10,308
Interest		649	588
Total Revenue		118,579	102,305
Gains on sale/revaluation of assets	6	13,899	5,486
Total income from continuing operations		**132,478**	**107,791**
Expenses from continuing operations			
Employee expenses	7	63,999	61,432
Supplies and services	8	33,362	29,415
Depreciation and amortisation	16,17	12,012	11,735
Other expenses	9	8,529	7,448
Finance costs		755	697
Total expenses from continuing operations		**118,657**	**110,727**
Operating result from continuing operations		**13,821**	**(2,936)**
Other comprehensive income			
Items that will not be reclassified subsequently to operating result			
Increase in asset revaluation surplus	21	-	-
Total other comprehensive income		**-**	**-**
Total comprehensive income/(loss)		**13,821**	**(2,936)**

The accompanying notes form part of these financial statements.

Statement of financial position
As at 30 June 2019

	Notes	2019 $'000	2018 $'000
Current assets			
Cash and cash equivalents	10	15,748	17,629
Receivables	11	8,339	10,174
Other financial assets	13	18,445	19,675
Inventories	12	258	256
Other current assets		1,220	645
		44,010	**48,379**
Assets classified as held for sale	15	525	-
Total current assets		**44,535**	**48,379**
Non-current assets			
Other financial assets	13	140,885	119,524
Property, plant and equipment	17	277,266	283,695
Intangible assets	16	280	396
Controlled and jointly controlled entities	32	275	23
Other non-current assets	14	5,949	-
Total non-current assets		**424,655**	**403,638**
Total assets		**469,190**	**452,017**
Current liabilities			
Payables	18	9,180	10,162
Accrued employee benefits	19	5,847	5,459
Unearned revenue	20	32,921	28,975
Total current liabilities		**47,948**	**44,596**
Total liabilities		**47,948**	**44,596**
Net assets		**421,242**	**407,421**
Equity			
Accumulated surplus		348,743	334,922
Asset revaluation surplus	21	72,499	72,499
Total equity		**421,242**	**407,421**

The accompanying notes form part of these financial statements.

The Council of The Queensland Institute of Medical Research

Statement of changes in equity
For the year ended 30 June 2019

	Accumulated surplus	Asset revaluation surplus (note 21)	Total
	$'000	$'000	$'000
Balance as at 1 July 2018	334,922	72,499	407,421
Operating result from continuing operations	13,821	-	13,821
Balance as at 30 June 2019	**348,743**	**72,499**	**421,242**
Balance as at 1 July 2017	337,858	72,499	410,357
Operating result from continuing operations	(2,936)	-	(2,936)
Balance as at 30 June 2018	**334,922**	**72,499**	**407,421**

The accompanying notes form part of these financial statements.

Statement of cash flows
For the year ended 30 June 2019

	Notes	2019 $'000	2018 $'000
Cash flows from operating activities			
Inflows:			
Grants and other contributions		73,667	68,262
User charges and fees		32,370	24,365
Other income		1,747	2,311
Interest income		649	559
GST input tax credits from ATO		3,516	3,397
GST collected from customers		1,934	1,590
Outflows:			
Employee expenses		(63,847)	(60,215)
Supplies and services		(39,380)	(33,477)
Finance costs		(755)	(697)
GST paid to suppliers		(3,267)	(3,403)
GST remitted to ATO		(1,987)	(1,600)
Other		(1,740)	(1,572)
Net cash generated by(used in)operating activities	CF1	**2,907**	**(480)**
Cash flows from investing activities			
Inflows:			
Redemptions of other financial assets		3,100	10,500
Net proceeds from sale of subsidiary		7,445	-
Sale of property, plant and equipment		26	119
Outflows:			
Investments in other financial assets		(10,278)	(6,127)
Acquisition of property, plant and equipment		(4,806)	(7,777)
Investment in related entity		(275)	-
Net cash used in investing activities		**(4,788)**	**(3,285)**
Cash flows from financing activities			
Inflows:			
Loans and advances redeemed from related entity		1,810	-
Outflows:			
Loans and advances made to related entity		(1,810)	-
Net cash used in financing activities		**-**	**-**
Net decrease in cash and cash equivalents		(1,881)	(3,765)
Cash and cash equivalents at beginning of financial year		17,629	21,394
Cash and cash equivalents at end of financial year	10	**15,748**	**17,629**

The accompanying notes form part of these financial statements.

Notes to the statement of cash flows
For the year ended 30 June 2019

	2019 $'000	2018 $'000
CF1 Reconciliation of operating result to net cash from operating activities		
Operating surplus/(deficit)	13,821	(2,936)
Depreciation and amortisation expense	12,012	11,735
Investment distributions in other financial assets	(11,228)	(7,008)
Loss on sale of property, plant and equipment	91	2
Net gain on sale of subsidiary	(12,441)	-
Net gain on market value of other financial assets	(1,549)	(5,488)
Donation of asset held for sale	(525)	-
Change in assets and liabilities:		
(Increase)/decrease in operating receivables	387	(2,464)
(Increase)/decrease in inventories	(2)	(3)
(Increase)/decrease in prepayments	(575)	(163)
Increase/(decrease) in operating payables	(1,518)	668
Increase/(decrease) in accrued employee benefits	388	454
Increase/(decrease) in unearned revenue	4,046	4,723
Net cash generated by(used in)operating activities	**2,907**	**(480)**

The accompanying notes form part of these financial statements.

The Council of The Queensland Institute of Medical Research

Notes to the financial statements
For the year ended 30 June 2019

Notes to the financial statements
For the year ended 30 June 2019

ABOUT COUNCIL AND THIS FINANCIAL REPORT

1. Basis of financial statement preparation

General information

The Council of the Queensland Institute of Medical Research is a Queensland statutory body established under the *Queensland Institute of Medical Research Act 1945* and is controlled by the State of Queensland which is the ultimate parent. The Council trades as QIMR Berghofer Medical Research Institute.

The head office and principal place of business of the statutory body is:
300 Herston Road
Herston QLD 4006

For information in relation to the Council's financial statements please call +61 7 3362 0222, email enquiries@qimrberghofer.edu.au or visit the internet site www.qimrberghofer.edu.au.

Compliance with prescribed requirements

The Council has prepared this financial report in compliance with the requirements of the *Financial and Performance Management Standard 2009*, *Financial Accountability Act 2009*, and the *Australian Charities and Not-for-profits Commission Act 2012*.

These financial statements are general purpose financial statements, and have been prepared on an accrual basis in accordance with Australian Accounting Standards and Interpretations. In addition, the financial statements comply with Queensland Treasury Minimum Reporting Requirements, and other authoritative pronouncements including the Australian Charities and Not-for-profits Commission (ACNC).

With respect to compliance with Australian Accounting Standards and Interpretations, the Council has applied those requirements applicable to not-for-profit entities, as the Council is a not-for-profit statutory body.

The reporting entity

The financial statements include the value of all revenues, expenses, assets, liabilities and equity of the Council and the entities it controls where these entities are material. No controlled entities are included as they are not considered material by Council (refer note 32).

Presentation details

Currency and rounding

Amounts included in the financial statements are in Australian dollars and have been rounded to the nearest $1,000 or, where that amount is $500 or less, to zero, unless disclosure of the full amount is specifically required.

Comparatives

Comparative information reflects the audited 2017-18 financial statements and has been restated where necessary to be consistent with disclosures in the current reporting period.

Current/non-current classification

Assets and liabilities are classified as either 'current' or 'non-current' in the statement of financial position and associated notes.

Assets are classified as 'current' where their carrying amount is expected to be realised within 12 months after the reporting date. Liabilities are classified as 'current' when they are due to be settled within 12 months after the reporting date, or the Council does not have an unconditional right to defer settlement to beyond 12 months after the reporting date.

All other assets and liabilities are classified as non-current.

Basis of measurement

Historical cost is used as the measurement basis in this financial report except for the following:

- Buildings which are measured at fair value; and
- Inventories which are measured at the lower of cost and net realisable value.

Historical cost

Under historical cost, assets are recorded at the amount of cash or cash equivalents paid or the fair value of the consideration given to acquire assets at the time of their acquisition. Liabilities are recorded at the amount of proceeds received in exchange for the obligation or at the amounts of cash or cash equivalents expected to be paid to satisfy the liability in the normal course of business.

Fair value

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date under current market conditions (i.e. an exit price) regardless of whether that price is directly derived from observable inputs or estimated using another valuation technique. Fair value is determined using the following approaches.

- The market approach uses prices and other relevant information generated by market transactions involving identical or comparable (i.e. similar) assets, liabilities or a group of assets and liabilities, such as a business.
- The cost approach reflects the amount that would be required currently to replace the service capacity of an asset. This method includes the current replacement cost methodology.

Where fair value is used, the fair value approach is disclosed.

Net realisable value

Net realisable value represents the amount of cash or cash equivalents that could currently be obtained by selling an asset in an orderly disposal.

Accounting estimates and judgements

The preparation of financial statements necessarily requires the determination and use of certain critical accounting estimates, assumptions, and management judgements that have the potential to cause a material adjustment to the carrying amounts of assets and liabilities within the next financial year. Such estimates, judgements and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised and in future periods as relevant.

Estimates and assumptions that have a potential significant effect are outlined in the following financial statement notes:

- Useful lives of property, plant and equipment – note 17
- Valuation of property, plant and equipment – note 17

Authorisation of financial statements for issue

The financial statements are authorised for issue by the Chair of Council, Director & Chief Executive Officer and Secretary at the date of signing the Management Certificate.

2. Objective and principal activities of the Council

The objective of the Council is to control and manage the operations of the Queensland Institute of Medical Research in accordance with the *Queensland Institute of Medical Research Act 1945*. The Council has been established to conduct research into all branches of medical science. It operates predominantly in one geographical area, being Queensland, Australia, although it has research collaborations across Australia and overseas.

The majority of the Council's funding is generated from competitive, peer reviewed research grants, commercial and other earned revenue. The Council also receives an annual operational grant from the Department of Health, Queensland (Queensland Health). Further funding is generated from donations, fundraising and investment activities performed under the guidance of the Council. Refer note 27.

Notes to the financial statements
For the year ended 30 June 2019

NOTES ABOUT OUR FINANCIAL PERFORMANCE

	2019 $'000	2018 $'000
3. Grants and other contributions		
Grants - National Health & Medical Research Council (NHMRCC)	28,063	24,502
Grants - Queensland Health	18,864	18,864
Grants - NHMRC overheads support funding (IRIISS)	5,231	4,251
Grants - Queensland Government	828	399
Grants - US Department of Defence	723	989
Grants - Cancer Council Queensland	471	791
Grants - National Breast Cancer Foundation	440	106
Grants - Australian Research Council	410	608
Grants - Perpetual Trustees Australia Limited	368	491
Grants - Children's Hospital Foundation	30	-
Grants - Other	6,734	6,782
Capital Grants - Australian Cancer Research Foundation (ACRF)	1,750	-
Capital Grants - Queensland Government	1,120	-
Donations and bequests	10,196	7,159
Total	**75,228**	**64,942**

Accounting policy - Grants and other contributions
Grants, contributions, donations, bequests, gifts and fundraising that are non-reciprocal in nature are recognised as revenue in the year in which the Council obtains control over them (control is generally obtained at time of receipt). Where grants are received that are reciprocal in nature, revenue is progressively recognised as it is earned according to the terms of the funding agreements. Contributed assets are recognised at their fair value.

Accounting policy - Services received free of charge or for nominal value
Contributions of services are recognised only if the services would have been purchased if they had not been donated and their fair value can be measured reliably. Where this is the case, an equal amount is recognised as revenue and an expense.

4. User charges and fees		
Commercial and contract research	26,258	23,720
Rent and licence fees	3,538	2,222
Sundry tenants recoveries	369	525
Total	**30,165**	**26,467**

Accounting policy - User charges and fees
User charges and fees from commercial services, rent (licence fees) and recoveries of expenditure incurred by customers who use the Council's laboratory consumables and services are recognised as revenue when it has been earned and can be measured reliably with a sufficient degree of certainty. This involves either invoicing for related goods/services and/or the recognition of accrued revenue. User charges and fees are controlled by the Council where they can be deployed for the achievement of Council objectives.

User charges and fees also include rental income from Institute tenants. The lease for the clinical trials

4. User charges and fees (cont'd)

facility with Q-Pharm Pty Ltd is being recognised on a periodic straight line basis over the full 10 year term.

	2019 $'000	2018 $'000
5. Other revenue		
Investment distributions	11,228	8,490
Reimbursements	486	921
Other	823	897
Total	**12,537**	**10,308**

Accounting policy - Reimbursements

Reimbursement from third parties for commercial and/or collaboration arrangements are recognised as revenue when the revenue has been earned and can be measured reliably with a sufficient degree of certainty. This involves either invoicing for related goods/services and/or the recognition of accrued revenue.

Accounting policy - Interest, dividends and distributions

Revenue for interest on cash and cash equivalents is recognised on an accrual basis. Revenue for dividends and distributions from managed funds classified as financial instruments held at fair value through profit or loss are recognised when the Council's right to receive payment is established.

Accounting policy - Imputation credits

As an endorsed income tax exempt charity, imputation credits attached to franked dividends received by the Council are refundable and may be claimed retrospectively after the end of the financial year (refer note 35). Imputation credits are brought to account when the right to receive the credits is established.

6. Gains/(losses) on sale/revaluation of assets		
Net gain on sale of subsidiary (refer note 32(a))	12,441	-
Net gain on market value of other financial assets	1,549	5,488
Net loss on disposal of property, plant and equipment	(91)	(2)
Total	**13,899**	**5,486**

The Council holds financial assets in managed funds. Refer notes 13 and 23.

Accounting Policy – Gains/(losses) on revaluation of other financial assets

Gains/(losses) arising from changes in the fair value of managed funds are included in the operating result for the period in which they arise.

Notes to the financial statements
For the year ended 30 June 2019

	2019 $'000	2018 $'000
7. Employee expenses		
Employee benefits		
Wages and salaries	49,178	48,098
Employer superannuation contributions	7,862	7,156
Annual leave expense	5,163	4,529
Long service leave levy	1,172	1,122
Other employee benefits	426	244
	63,801	61,149
Employee related expenses		
Workers' compensation premium	93	102
Other employee related expenses	89	101
Fringe benefits tax expense	16	80
	198	283
Total	**63,999**	**61,432**
The number of employees including full-time, part-time and casual employees measured on a full-time equivalent basis is:	593	569

Employee benefits
Wages and salaries, employer superannuation contributions, annual leave expense and long service leave levies are regarded as employee benefits.

Accounting policy – Wages & salaries
Accruals for wages, salaries and annual leave expense due but unpaid at reporting dates are recognised in the statement of financial position at current salary rates. Annual leave entitlements are recognised at their undiscounted values and are classified as current liabilities as Council does not have the unconditional right to defer settlement for the next 12 months.

Accounting policy – Sick leave
As sick leave is non-vesting, an expense is recognised for this leave as it is taken. Prior history indicates that on average, sick leave taken each reporting period is less than the existing accumulated entitlements and thus no liability for unused sick leave entitlements is recognised. This is expected to continue in future periods.

Accounting policy - Long service leave
Under the Queensland Government's long service leave scheme, a levy is made on the statutory body to cover the cost of employees' long service leave. The levies are expensed in the period in which they are payable. Amounts paid to employees for long service leave are claimed from the scheme quarterly in arrears.

Accounting policy – Superannuation
Employer superannuation contributions are paid to QSuper, the superannuation scheme for Queensland Government employees, at rates specified under the Enterprise Agreement and Council's Superannuation Policy. Contributions are expensed in the period in which they are paid or payable. The Council's obligation is limited to its contribution to QSuper. The QSuper scheme has defined benefit and defined contribution categories. The liability for defined benefits is held on a whole-of-government basis and reported in those financial statements pursuant to

7. Employee expenses (cont'd)

AASB 1049 *Whole of Government and General Government Sector Financial Reporting.*

Accounting policy – Workers' compensation premiums
The Council pays premiums to WorkCover Queensland and inter-state QBE in respect of its obligations for employee compensation. Workers' compensation insurance is a consequence of employing employees, but is not counted in an employee's total remuneration package. It is not an employee benefit and is recognised separately as employee related expenses.

	2019 $'000	2018 $'000
8. Supplies and services		
Supplies and consumables	14,815	13,287
Scientific collaborations	6,765	3,671
Consultants and contractors	4,673	4,998
Utilities	2,354	2,591
Service contracts	2,402	2,234
Travel	1,379	1,455
Minor equipment and software purchases	913	1,112
Operating lease rentals	61	67
Total	**33,362**	**29,415**

Accounting policy – Operating leases
Operating lease payments are representative of the pattern of benefits derived from the leased assets and are expensed in the periods in which they are incurred.

Accounting policy - Scientific collaboration distributions
Council has a number of research collaboration agreements in place with various granting bodies and universities. Distributions are made in terms of these collaboration agreements and are recognised as an expense in the period in which they are incurred.

9. Other expenses		
Commercial and contract research distributions	7,545	6,495
Insurance	582	583
Legal expenses	244	185
Audit & other fees - internal	84	96
Audit fees - external *	77	67
Net (gain)/loss on foreign exchange transactions	(1)	2
Other	(2)	20
Total	**8,529**	**7,448**

9. Other expenses (cont'd)

* Total external audit fees to be paid to the Queensland Audit Office relating to the 2018-19 financial year are $76,500 (2018: $67,000). There are no non-audit services included in this amount.

Accounting policy - Insurance
The Council's non-current physical assets and other risks are insured through the Queensland Government Insurance Fund (QGIF), premiums being paid on a risk assessment basis. In addition, the Council has policies with private insurance companies to cover risks not included by QGIF.

Accounting policy - Commercial and contract research distributions
The Council has a number of commercial and licence arrangements in place. Under the Council's contract research policy, distributions to researchers may be made to Employee Research Services accounts (refer note 30) from the proceeds of industry sponsored contracts. These distributions are recognised as an expense at the time of invoicing under the contract. Additionally, under the Council's intellectual property policy, distributions to inventors or contributors are recognised as an expense at the time of milestone invoicing under these contractual arrangements. Payments to inventors or contributors may be made in the subsequent financial year following their recognition.

Notes to the financial statements
For the year ended 30 June 2019

NOTES ABOUT OUR FINANCIAL POSITION

	2019	2018
	$'000	$'000
10. Cash and cash equivalents		
Term deposits	15,654	16,415
Cash at bank and on call	8,463	7,907
Employee Research Services (ERS)	(8,370)	(6,693)
Imprest accounts	1	-
Total	**15,748**	**17,629**

The Council's term deposits consist entirely of unspent research grant funds, refer note 20. For Employee Research Services (ERS) funds held in cash and cash equivalents refer note 30.

Accounting policy - Cash and cash equivalents
For the purposes of the statement of financial position and the statement of cash flows, cash assets include all cash and cheques receipted but not banked at 30 June as well as deposits at call with financial institutions.

11. Receivables		
Trade receivables	6,328	7,984
Less: Loss allowance	-	-
	6,328	7,984
GST receivable	45	175
Long service leave reimbursements	270	164
Accrued interest	135	135
Other receivables	1,561	1,716
Total	**8,339**	**10,174**

Accounting policy - Receivables
Receivables are measured at amortised cost which approximates their fair value at reporting date. Trade debtors are recognised at the amounts due at the time of sale or service delivery i.e. the agreed purchase/contract price. Settlement of these amounts is required within 30 days of invoice date.

Other debtors generally arise from transactions outside the usual operating activities of the Council and are recognised at their assessed values. Terms are a maximum of 30 days, no interest is charged and no security is obtained.

Disclosure - Credit risk exposure of receivables
The maximum exposure to credit risk at balance date for receivables is the gross carrying amount of those assets. No collateral is held as security and no credit enhancements relate to receivables held by the Council.

The Council uses a provision matrix to calculate a loss allowance for receivables. The provision matrix is initially based on the Council's historical observed default rates. Any loss allowance incorporates reasonable and supportive forward-looking information. Economic changes impacting the Council's debtors, and relevant industry data form part of Council's impairment assessment. At every reporting date, the historical observed default rates are updated and changes in the forward-looking estimates are analysed. The assessment of the correlation between historical observed default rates, forecast economic conditions and the loss allowance is a significant estimate. The

Notes to the financial statements
For the year ended 30 June 2019

11. Receivables (cont'd)

amount of the loss allowance is sensitive to changes in circumstances and of forecast economic conditions. The Council's historical credit loss experience and forecast economic conditions may also not be representative of customer's actual default in the future.

Following a review of Council trade and other debtors over the past 10 years, no loss allowance has been made in 2018-19 given the historical immaterial quantum of bad debts involved over this review period.

Accounting policy – Impairment of receivables
Where Council has no reasonable expectation of recovering an amount owed by a debtor, the debt would be written-off by directly reducing the receivable against the loss allowance. This occurs when the debt is over 120 days past due and Council has ceased enforcement activity. If the amount of debt written off exceeds the loss allowance, the excess would be recognised as an impairment loss.

Disclosure - Ageing of past due but not impaired receivables
Ageing of past due but not impaired financial assets is disclosed in the following tables. No financial assets were assessed as being impaired as at 30 June 2019.

2019 Financial assets past due but not impaired

	Not Due	Overdue				Not due and overdue
	<30 days	30-60 days	61-90 days	>90 days	Total	Total
	$'000	$'000	$'000	$'000	$'000	$'000
Financial assets						
Receivables	5,442	1,065	411	1,421	2,897	8,339
Total	**5,442**	**1,065**	**411**	**1,421**	**2,897**	**8,339**

2018 Financial assets past due but not impaired

	Not Due	Overdue				Not due and overdue
	<30 days	30-60 days	61-90 days	>90 days	Total	Total
	$'000	$'000	$'000	$'000	$'000	$'000
Financial assets						
Receivables	8,783	359	90	942	1,391	10,174
Total	**8,783**	**359**	**90**	**942**	**1,391**	**10,174**

Notes to the financial statements
For the year ended 30 June 2019

	2019 $'000	2018 $'000
12. Inventories		
Supplies and consumables – at cost	259	256
Total	**259**	**256**

Accounting policy - Inventories
Inventories are represented by consumable laboratory supplies valued at the lower of cost and net realisable value.

Cost is assigned on a weighted average basis and includes expenditure incurred in acquiring the inventories and bringing them to their existing condition. During the 2018-19 financial year $1.1m of inventories (2018: $1.1m) were expensed.

Net realisable value is determined by estimating the selling price in the ordinary course of business, less the estimated costs of completion and selling expenses. No inventory assets have been classified as inventories held for distribution.

All inventories on hand at 30 June are expected to be utilised within 12 months.

13. Other financial assets

Current		
Managed fund investments		
Budgeted drawdowns	12,000	15,000
Grant funds	6,445	4,675
Total	**18,445**	**19,675**
Non current		
Managed fund investments	140,885	119,524
Total	**140,885**	**119,524**

Accounting policy - Other financial assets
Other financial assets held at fair value through profit or loss represent investments in managed funds. The investments are stated at current market value at the reporting date. Changes in the market value of these instruments, whether realised or unrealised, are recognised in the statement of comprehensive income. These investments were originally classified at fair value through profit or loss upon initial recognition and the Council manages these investments and makes purchases and sales decisions based on their fair value in accordance with the Council's documented investment strategy.

All managed fund investments are categorised as level 1 investments in accordance with the fair value hierarchy which reflects the unadjusted quoted market price. Refer note 23 for liquidity risk management. The current portion of managed funds is made up of unspent grant funds invested (refer note 20) plus drawdowns approved by Council in the 2019/20 Budget which can be used for operational cash requirements if needed.

Notes to the financial statements
For the year ended 30 June 2019

	2019 $'000	2018 $'000
14. Other assets		
Non-current assets		
NPV of final instalment from sale of subsidiary	5,413	-
Lease receivable	536	-
Total	**5,949**	**-**

Accounting Policy – Other assets
Other assets generally arise from transactions outside the usual operating activities of the Council and are recognised at their contract values. The deferred consideration on the sale of Q-Pharm Pty Ltd receivable totalling $5.5m due 31 January 2021 has been discounted at the two year government bond rate (refer note 32 (a)).

15. Assets classified as held for sale		
Residential property	525	-
Total	**525**	**-**

Accounting Policy – Assets held for sale
Assets held for sale consist of those assets that management has determined are available for immediate sale in their present condition, for which their sale is highly probable within the next twelve months.

Under AASB 5 Non-current Assets Held for Sale and Discontinued Operations, when an asset is classified as held for sale, its value is measured at the lower of the asset's carrying amount and fair value less cost to sell. Any restatement of the asset's value to fair value less costs to sell is a non-recurring valuation. Such assets are no longer amortised or depreciated upon being classified as held for sale.

Disclosures - current assets held for sale
Council intends to sell a donated residential property in 2019-20. The fair value for the residential property reflects a valuation dated 4 December 2018 by a registered property valuer. Given the observable nature of this information, the fair value less costs to sell represents a 'level 2' measurement (refer note 22).

16. Intangible assets		
Software purchased: At cost		
Gross	679	679
Less: Accumulated amortisation	(653)	(586)
	26	**93**
Software internally generated: At cost		
Gross	474	474
Less: Accumulated amortisation	(220)	(171)
	254	**303**
Total	**280**	**396**

16. Intangible assets (cont'd)

Accounting policy - Recognition and measurement of intangibles
Intangible assets with a cost or other acquisition value equal to or greater than $100,000 are recognised in the statement of financial position; items with a lesser value are expensed.

It has been determined that there is not an active market for any of the Council's intangible assets. As such, the assets are recognised and carried at cost less accumulated amortisation and accumulated impairment losses.

No intangible assets have been classified as held for sale or form part of a disposal group held for sale.

Key Judgement: Council also controls a number of software assets that are not recognised as assets because they fail to meet the AASB 138 recognition criteria.

Accounting policy - Amortisation expense
All intangibles assets of the Council have finite useful lives and are amortised on a straight line basis over their estimated useful life to the Council. Straight line amortisation is used reflecting the expected consumption of economic benefits on a progressive basis over the intangible's useful life. The residual value of all Council's intangible assets is zero.

Useful life
Key estimate: For each class of intangible asset the following amortisation rates are used:

Intangible Asset	Useful life
Purchased software	10 years
Internally generated software	10 years

Accounting policy – Impairment
All intangible assets are assessed for indicators of impairment on an annual basis. If an indicator of possible impairment exists, the Council determines the asset's recoverable amount. Any amount by which the asset's carrying amount exceeds the recoverable amount is recorded as an impairment loss.
Intangible assets are principally assessed for impairment by reference to the actual and expected continuing use of the asset by the Council, including discontinuing the use of software. The recoverable amount is determined as the higher of the asset's fair value less costs to sell and its value-in-use.

Intangible assets– balances and reconciliations of carrying amount

Intangibles reconciliation of carrying amount	Software internally generated	Software purchased	Software work in progress	Total
	2019 $'000	2019 $'000	2019 $'000	2019 $'000
Carrying amount at 1 July 2018	**303**	**93**	**-**	**396**
Acquisitions	-	-	-	-
Disposals	-	-	-	-
Transfers between classes	-	-	-	-
Amortisation	(49)	(67)	-	(116)
Carrying amount at 30 June 2019	**254**	**26**	**-**	**280**

Notes to the financial statements
For the year ended 30 June 2019

16. Intangible assets (cont'd)

	Software internally generated	Software purchased	Software work in progress	Total
	2018 $'000	2018 $'000	2018 $'000	2018 $'000
Carrying amount at 1 July 2017	350	161	-	511
Acquisitions	-	-	-	-
Disposals	-	-	-	-
Transfers between classes	-	-	-	-
Amortisation	(47)	(68)	-	(115)
Carrying amount at 30 June 2018	**303**	**93**	**-**	**396**

	2019 $'000	2018 $'000
17. Property, plant and equipment		
Buildings: At fair value		
Gross	343,434	340,923
Less: Accumulated depreciation	(85,801)	(79,468)
	257,633	**261,455**
Plant & equipment: At cost		
Gross	61,357	63,143
Less: Accumulated depreciation	(43,346)	(41,881)
	18,011	**21,262**
Work in progress: At cost *	1,622	978
	1,622	**978**
Total	**277,266**	**283,695**

* Work in progress includes various building improvement and renewal projects which are ongoing as at 30 June 2019.

17. Property, plant and equipment (cont'd)

Property plant and equipment – balances and reconciliations of carrying amount (including fair value level).

	Buildings (Research Facilities) Level 3	Plant & equipment	Work in progress	Total
	2019 $'000	2019 $'000	2019 $'000	2019 $'000
Carrying amount at 1 July 2018	**261,455**	**21,262**	**978**	**283,695**
Acquisitions	-	2,429	3,155	5,584
Disposals	-	(117)	-	(117)
Transfers between classes	2,511	-	(2,511)	-
Revaluation increments	-	-	-	-
Depreciation	(6,333)	(5,563)	-	(11,896)
Carrying amount at 30 June 2019	**257,633**	**18,011**	**1,622**	**277,266**

	Buildings (Research Facilities) Level 3	Plant & equipment	Work in progress	Total
	2018 $'000	2018 $'000	2018 $'000	2018 $'000
Carrying amount at 1 July 2017	**265,679**	**22,347**	**427**	**288,453**
Acquisitions	-	4,386	2,597	6,983
Disposals	-	(121)	-	(121)
Transfers between classes	2,046	-	(2,046)	-
Revaluation increments	-	-	-	-
Depreciation	(6,270)	(5,350)	-	(11,620)
Carrying amount at 30 June 2018	**261,455**	**21,262**	**978**	**283,695**

17. Property, plant and equipment (cont'd)

Accounting policy – Recognition
Items of property, plant and equipment with a cost or other value equal to or in excess of the following thresholds are recognised for financial reporting purposes in the year of acquisition:

Class	Threshold
Buildings	$10,000
Plant and equipment	$5,000
Other (including heritage & cultural)	$5,000

Items with a lesser value are expensed in the year of acquisition.

Expenditure on property, plant and equipment is only capitalised if it increases the service potential or useful life of the existing asset. Maintenance expenditure that merely restores original service potential (arising from ordinary wear and tear) is expensed.

The Council owns and occupies three buildings situated on Crown land reserved and set apart for hospital purposes. The land is under the control of Metro North Hospital & Health Service (MNHHS) on behalf of The State of Queensland.

Leases for the land occupied by two of the buildings (the Bancroft Centre and the Clive Berghofer Cancer Research Centre) exist between the Council and The State of Queensland (represented by Queensland Health) at a nominal rental, terminating on 27 June 2066. A new lease for the land occupied by all three buildings is expected to be entered into between Council and MNHHS at nominal rental. Upon commencement of the new lease, the existing leases will be surrendered. Refer notes 28 and 33.

Accounting policy – Cost of acquisition
Historical cost is used for the initial recording of all non-current physical asset acquisitions. Cost is determined as the value given as consideration plus costs incidental to the acquisition and those incurred in getting the assets ready for use.

Where assets are received free of charge from another Queensland Government entity, the acquisition cost is recognised as the gross carrying amount in the books of the transferor immediately prior to the transfer together with any accumulated depreciation.

Assets acquired at no cost or for nominal consideration, other than from another Queensland Government entity, are recognised at their fair value at the date of acquisition.

Accounting policy – Measurement using historical cost
Plant and equipment is measured at cost in accordance with Queensland Treasury *Non-Current Asset Policies*. The carrying amounts for plant and equipment at cost does not materially differ from their fair value.

Accounting policy – Measurement using fair value
Buildings are measured at fair value in accordance with AASB 116 *Property, Plant and Equipment*, AASB 13 *Fair Value Measurement* and Queensland Treasury *Non-Current Asset Policies* for the Queensland Public Sector. These assets are reported at their revalued amounts, being the fair value at the date of valuation, less accumulated depreciation and impairment losses where applicable. In respect of these asset classes, the cost of items acquired

17. Property, plant and equipment (cont'd)

during the financial year has been judged by Council to materially represent their fair value at the end of the reporting period.

Buildings measured at fair value are revalued on an annual basis either by appraisals undertaken by an independent professional valuer, or by the use of appropriate and relevant indices, where the movement in fair value is material.

Use of independent valuation
Revaluations using an independent professional valuer are undertaken at least once every five years, the most recent being as at 30 June 2017 by the firm AECOM.

The fair values reported by the Council are based on appropriate valuation techniques that maximise the use of available and relevant observable inputs and minimise the use of unobservable inputs. As there is no active market for research facilities as the majority of building floor space is specialist research laboratories, the basis of the valuation is on a cost approach which involves estimating the amount that would currently be required to replace the service capacity of an asset (referred to as Current Replacement Cost). This is a level 3 categorisation, as referenced in note 22.

The Replacement Cost is the total construction cost (including design fees and typical levels of contingency) if the asset was replaced on the valuation date with a modern day equivalent applying the 'highest and best use' principles.

For the valuation as at 30 June 2017, the Council elected to retain management's accumulated depreciation which is based on the estimated standard life of a mixed laboratory/office building of 50 years.

Use of Indices
Where buildings have not been independently valued in the reporting period, their previous valuations are materially kept up-to-date via the application of relevant indices, ensuring the resulting value is a valid estimation of the buildings' fair values at reporting date. In the absence of another appropriate published index, the Council uses the CPI (*Consumer Price Index (a): All groups, Brisbane and weighted average of eight capital cities*) published by the Australian Bureau of Statistics.

As at 30 June 2019, the change in the index since the last valuation is not considered material (less than 5% change) and consequently the carrying values of the three buildings have not been adjusted in the reporting period.

Accounting for changes in Fair Value
Any increment arising on the revaluation of buildings is credited to the asset revaluation reserve, except to the extent it reverses a revaluation decrement previously recognised as an expense. A decrease in the carrying amount on revaluation is charged as an expense, to the extent it exceeds the balance, if any, in the revaluation surplus.

Accounting policy – Depreciation of property, plant and equipment
Property, plant and equipment is depreciated on a straight-line basis so as to allocate the net cost or revalued amount of each asset, less its estimated residual value, progressively over its estimated useful life to the Council, consistent with the even consumption of service potential.

Assets under construction (work-in-progress) are not depreciated until they reach service delivery capacity. Service

17. Property, plant and equipment (cont'd)

delivery capacity relates to when construction is complete and the asset is first put to use or is installed ready for use in accordance with its intended application. These assets are then reclassified to the relevant classes within property, plant and equipment.

Buildings including structure and components are treated for accounting depreciation purposes as a single asset and depreciated over 50 years.

Any expenditure that increases the originally assessed capacity or service potential of an asset is capitalised and the new depreciable amount is depreciated over the remaining useful life of the asset to the Council.

For the Council's depreciable assets, the estimated amount to be received on disposal at the end of their useful life (residual value) is determined to be zero.

Useful life
Key estimate: For each class of depreciable assets the following useful lives are used:

Property, Plant and Equipment Asset	Useful life
Buildings	50 years
Plant and Equipment	3-20 years

Accounting policy – Impairment of non-current assets
All non-current physical assets are assessed for indicators of impairment on an annual basis or, where the asset is measured at fair value, for indicators of a change in fair value/service potential since the last valuation was completed. Where indicators of a material change in fair value or service potential since the last valuation arise, the asset is revalued at the reporting date under AASB 13 *Fair Value Measurement*. If an indicator of possible impairment exists, the Council determines the asset's recoverable amount under AASB 136 *Impairment of Assets.* Any amount by which the asset's carrying amount exceeds the recoverable amount is recorded as an impairment loss.

Recoverable amount is equal to the higher of the fair value less costs of disposal and the asset's value in use subject to the following:

- As a not-for-profit entity, certain property, plant and equipment of the Council is held for the continuing use of its service capacity and not for the generation of cash flows. Such assets are typically specialised in nature. In accordance with AASB 136, where such assets are measured at fair value under AASB 13, that fair value (with no adjustment for disposal costs) is effectively deemed to be the recoverable amount. As a consequence, AASB 136 does not apply to such assets unless they are measured at cost.
- For other non-specialised property, plant and equipment measured at fair value, where indicators of impairment exist, the only difference between the asset's fair value and its fair value less costs of disposal is the incremental costs attributable to the disposal of the asset. Consequently, the fair value of the asset determined under AASB 13 will materially approximate its recoverable amount where the disposal costs attributable to the asset are negligible. After the revaluation requirements of AASB 13 are first applied to these assets, applicable disposal costs are assessed and, in the circumstances where such costs are not negligible, further adjustments to the recoverable amount are made in accordance with AASB 136.

17. Property, plant and equipment (cont'd)

For all other remaining assets measured at cost, and assets within the economic entity held for the generation of cash flows recoverable amount is equal to the higher of the fair value less costs of disposal and the asset's value in use.

Value in use is equal to the present value of the future cash flows expected to be derived from the asset, or where Council no longer uses an asset and has made a formal decision not to reuse or replace the asset, the value in use is the present value of net disposal proceeds.

Recognising Impairment Losses
For assets measured at fair value, an impairment loss is treated as a revaluation decrease and offset against the asset revaluation surplus of the relevant class to the extent available. Where no asset revaluation surplus is available in respect of the class of asset, the loss is expensed in the statement of comprehensive income as a revaluation decrement.

For assets measured at cost, an impairment loss is recognised immediately in the statement of comprehensive income.

	2019 $'000	2018 $'000
18. Payables		
Accrued expenses	3,332	2,660
Accrued wages	1,247	2,317
Trade creditors	2,201	1,556
Other	2,400	3,629
Total	**9,180**	**10,162**

Accounting Policy – Payables
Trade creditors are recognised upon receipt of the goods or services ordered and are measured at the nominal amount i.e. agreed purchase/contract price, gross of applicable trade and other discounts. Standard payment terms are end of month following month of invoice. Amounts owing are unsecured.

19. Accrued employee benefits		
Current		
Annual leave entitlements payable	5,287	4,921
Long service leave levy payable	282	298
Other	278	240
Total	**5,847**	**5,459**

Accounting policy – Accrued employee benefits

No provision for long service leave is recognised in the Council's financial statements, the liability being held on a whole-of-government basis and reported in those financial statements pursuant to AASB 1049 *Whole of Government and General Government Sector Financial Reporting.*

Notes to the financial statements
For the year ended 30 June 2019

19. Accrued employee benefits (cont'd)

Accruals for wages, salaries and annual leave expense due but unpaid at reporting dates are recognised in the statement of financial position at the current salary rates.

Annual leave entitlements are recognised at their undiscounted values and are classified as current liabilities as Council does not have the unconditional right to defer settlement for the next 12 months.

20. Unearned Revenue

	Balance b/f 1July 2018 $'000	Funds received $'000	Funds recognised	Balance c/f 30 June 2019 $'000
National Health & Medical Research Council	14,238	28,756	(28,063)	14,931
Australian Research Council	(69)	606	(410)	127
Cancer Council Qld	272	550	(471)	351
Children's Hospital Foundation	-	426	(30)	396
Queensland Government	381	646	(828)	199
Medicines for Malaria Venture (MMV)	46	2,841	(2,612)	275
National Breast Cancer Foundation	63	417	(440)	40
Perpetual Trustees Australia Limited	368	-	(368)	-
US Department of Defence	(176)	808	(723)	(91)
Other granting bodies	5,967	6,646	(6,742)	5,871
Granting bodies – sub total	**21,090**	**41,696**	**(40,687)**	**22,099**
Commercial partners	7,885	7,631	(4,694)	10,822
Total	**28,975**	**49,327**	**(45,381)**	**32,921**

	Balance b/f 1July 2017 $'000	Funds received $'000	Funds recognised	Balance c/f 30 June 2018 $'000
National Health & Medical Research Council	11,565	27,175	(24,502)	14,238
Australian Research Council	339	200	(608)	(69)
Cancer Council Qld	345	718	(791)	272
Queensland Government	10	770	(399)	381
Medicines for Malaria Venture (MMV)	179	2,310	(2,443)	46
National Breast Cancer Foundation	-	169	(106)	63
Perpetual Trustees Australia Limited	188	671	(491)	368
US Department of Defence	(134)	947	(989)	(176)
Other granting bodies	5,570	6,830	(6,433)	5,967
Granting bodies – sub total	**18,062**	**39,790**	**(36,762)**	**21,090**
Commercial partners	6,190	6,580	(4,885)	7,885
Total	**24,252**	**46,370**	**(41,647)**	**28,975**

20. Unearned Revenue (cont'd)

Unspent grant funds of $15.65m (2018:$16.41m) are held in term deposits (refer note 10) and $6.45m (2018: $4.67m) in other financial assets (refer note 13). Where the grantors funding rules require unspent funds to be held in a bank account, those funds are in term deposits.

Accounting policy - Unearned revenue

Where grants are received that are reciprocal in nature, revenue is progressively recognised. Where funds from commercial partners are received, revenue is recognised as it is earned according to the terms of the funding agreements. A liability has been recognised to show funds not earned at balance date.

21. Asset revaluation surplus by class

	Buildings	Total
	$'000	$'000
Balance as at 1 July 2018	72,499	72,499
Revaluation increments/(decrements)	-	-
Balance as at 30 June 2019	**72,499**	**72,499**

	Buildings	Total
	$'000	$'000
Balance as at 1 July 2017	72,499	72,499
Revaluation increments/(decrements)	-	-
Balance as at 30 June 2018	**72,499**	**72,499**

Accounting policy - Asset revaluation surplus

The asset revaluation surplus represents the net effect of upwards and downwards revaluations of assets to fair value.

NOTES ABOUT RISKS AND OTHER ACCOUNTING UNCERTAINTIES

22. Fair value measurement

Accounting policy – Inputs for fair values
Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date under current market conditions (i.e. an exit price) regardless of whether that price is directly derived from observable inputs or estimated using another valuation technique.

Observable inputs are publicly available data that are relevant to the characteristics of the assets/liabilities being valued.

Unobservable inputs are data, assumptions and judgements that are not available publicly, but are relevant to the characteristics of the assets/liabilities being valued. Significant unobservable inputs used by the Council include, but are not limited to, subjective adjustments made to observable data to take account of the characteristics of the Council's assets/liabilities, internal records of recent construction costs (and/or estimates of such costs) for asset's characteristics/functionality, and assessments of physical condition and remaining useful life. Unobservable inputs are used to the extent that sufficient relevant and reliable observable inputs are not available for similar assets/liabilities.

A fair value measurement of a non-financial asset takes into account a market participant's ability to generate economic benefits by using the asset in its highest and best use or by selling it to another market participant that would use the asset in its highest and best use.

Fair value measurement hierarchy
All assets of the Council for which fair value is measured or disclosed in the financial statements are categorised within the following fair value hierarchy, based on the data and assumptions used in the most recent specific appraisals:

Level 1	represents fair value measurements that reflect unadjusted quoted market prices in active markets for identical assets;
Level 2	represents fair value measurements that are substantially derived from inputs (other than quoted prices included within level 1) that are observable, either directly or indirectly; and
Level 3	represents fair value measurements that are substantially derived from unobservable inputs.

There were no transfers of assets between fair value hierarchy levels during the current or prior years.

Basis for fair values of assets
Refer to note 17 for details of the basis for fair value measurement of buildings held by QIMR Berghofer.

Notes to the financial statements
For the year ended 30 June 2019

23. Financial risk disclosures

(a) Financial instrument categories

Accounting policy – Financial instruments
Recognition
Financial assets and financial liabilities are recognised in the statement of financial position when Council becomes party to the contractual provisions of the financial instrument.

The Council has the following categories of financial assets and financial liabilities:

	2019	2018
	$'000	$'000
Financial assets		
Financial assets held at fair value through profit or loss:		
Cash and cash equivalents	15,748	17,629
Other financial assets	159,330	139,199
Financial assets held at amortised cost:		
Receivables	8,339	10,174
Other assets - non-current (discounted)	5,949	-
	189,366	**167,002**
Financial liabilities		
Financial liabilities measured at amortised cost:		
Payables	9,180	10,162
	9,180	**10,162**

No financial assets and financial liabilities have been offset and presented net in the statement of financial position.

The Council does not enter into transactions for speculative purposes, or for hedging.

(b) Financial risk management

Risk exposure

Financial risk management is implemented pursuant to Queensland Government and Council policy. These policies focus on the unpredictability of financial markets and seek to minimise potential adverse effects on the financial performance of the Council.

All financial risk is managed by the Institute under policies approved by the Council. The Council provides written principles for overall risk management, as well as policies covering specific areas.

Council's activities expose it to a variety of financial risks as set out in the following table:

Notes to the financial statements
For the year ended 30 June 2019

23. Financial risk disclosures (cont'd)

Risk Exposure	Definition	Exposure
Credit risk	The risk that the Council may incur financial loss as a result of another party to a financial instrument failing to discharge their obligation.	The Council is exposed to credit risk in respect of its receivables (note 11) and other non-current assets (note 14).
Liquidity risk	The risk that the Council may encounter difficulty in meeting obligations associated with financial liabilities that are settled by delivering cash or another financial asset.	The Council is exposed to liquidity risk in respect of its payables (note 18).
Market risk	The risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk comprises three types of risk: currency risk, interest rate risk and other price risk. Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates.	The Council is exposed to market risk on its managed funds (note 13). The Council is exposed to currency risk in respect of its commercial contracts entered into denominated in US dollars. It maintains a bank account in Hong Kong with an immaterial cash balance denominated in HK dollars used to fund the operations of a local study. The Council is exposed to interest rate risk through its cash deposited in interest bearing accounts (note 10).

Risk measurement and management strategies
Council measures risk exposure using a variety of methods as follows:

Risk Exposure	Measurement Method	Risk Management Strategies
Credit risk	Ageing analysis, earnings at risk	The Council manages credit risk through the use of a credit management strategy. This strategy aims to reduce the exposure to credit default by ensuring that the Council invests in secure assets and monitors all funds owed on a timely basis. Exposure to credit risk is monitored on an ongoing basis. Other non–current assets are part of a share sale agreement with a specific contract due and receivable date.

23. Financial risk disclosures (cont'd)

Risk Exposure	Measurement Method	Risk Management Strategies
Liquidity risk	Sensitivity analysis	The Council manages liquidity risk through the use of a liquidity management strategy. This strategy aims to reduce the exposure to liquidity risk by ensuring the Council has sufficient funds available to meet employee and supplier obligations as they fall due. This is achieved by ensuring that minimum levels of cash are held within the various bank accounts so as to match the expected duration of the various employee and supplier liabilities. Managed funds held under 'Other Financial Assets' represent investments that are the Institutes long term endowment type funds as well as funds invested in excess of short term operational requirements. These funds can, if required, be redeemed by Council within a relatively short period of time to meet operational cash requirements (note 13).
Market risk	Interest rate sensitivity analysis	The Council does not undertake any hedging in relation to interest risk and manages its risk as per the Council's liquidity risk management strategy articulated in the Council's policies. The Council is exposed to movements in interest rate risk through its investment in externally managed funds and its holdings in cash and cash equivalents. The Council does not undertake any hedging in relation to foreign currency risk and manages this through conservative exchange rate estimates when pricing commercial contracts. The Council places managed funds with three separate fund managers. The Investment Committee (a committee of Council) oversees the performance of these funds.

Credit risk disclosures

Credit risk management practice

The Council considers financial assets that are over 30 days past due to have significantly increased credit risk, and measures the loss allowance of such assets at lifetime expected credit losses instead of 12-month expected credit losses. The exception is trade receivables (Note 11) for which the loss allowance is always measured at lifetime expected credit losses.

The Council typically considers a financial asset to be in default when it becomes 90 days past due. However, a financial asset can be in default before this point if information indicates that the Council is unlikely to receive the outstanding amounts in full. The Council assessment of default does not take into account any collateral or other credit enhancements.

The Council write off policy is disclosed in Note 11.

24. Contingencies

(a) Contingent assets

Contributions to Queensland Community Foundation
The QIMR Trust established a fund with the Queensland Community Foundation (QCF) for the purpose of generating future income and donations. This fund was transferred to Council upon abolition of the QIMR Trust on 1 February 2011. All contributions made to this named fund within QCF are held in a charitable trust (with The Public Trustee of Queensland as Trustee) and invested in perpetuity with net income distributed to the Council at the discretion of the Trustee in accordance with the Queensland Community Fund Declaration of Trust. Council may, from time to time, become eligible to receive a distribution from the Foundation, but does not have a proprietary or legal interest in the Foundation nor does the Foundation hold property for Council's benefit. Based on previous distributions, Council expects any future income from the Fund to be immaterial.

(b) Contingent liabilities

The Council does not have any contingent liabilities at 30 June 2019.

25. Commitments

(a) Non-cancellable operating leases

Commitments under operating leases at reporting date are inclusive of anticipated GST and are payable as follows:

	2019 $'000	2018 $'000
Payable:		
Not later than one year	39	53
Later than one year and not later than five years	91	119
Total	**130**	**172**

Operating leases have renewal options, however, no leases have escalation clauses other than in the event of payment default. No lease arrangements create restrictions on other financing transactions.

(b) Capital expenditure commitments

Building works	104	378
Other capital commitments	389	249
	493	**627**

Building works represents 21% of capital expenditure commitments (2018: 60%). The values shown are based on the committed contract value inclusive of anticipated GST.

Payable:		
Not later than one year	493	627
Total	**493**	**627**

Notes to the financial statements
For the year ended 30 June 2019

	2019 $'000	2018 $'000
25. Commitments (cont'd)		
(c) Operating lease receivable		
Lease fees receivable for use of the premises are as follows:		
Receivable:		
Not later than one year	3,350	2,000
Later than one year and not later than five years	13,400	8,000
Later than five years	9,188	5,000
Total	**25,938**	**15,000**

Comprises two separate leases each with a lease term of 10 years from commencement date (1 January 2016 and 1 February 2019). These amounts do not include lease fees which may become receivable under the lease on the basis of registered associates on the premises in excess of stipulated minimums and do not include any recovery of expenses such as scientific services, electricity and water costs.

26. Events occurring after balance date

There are no events occurring after balance date having a material impact on the figures reported in these financial statements.

27. Economic dependency

The Council's activities are predominantly funded by grants received from a range of funding agencies, the majority of which are Commonwealth and State Government bodies. The ability of the Council to source sufficient grant funding is dependent upon those entities continuing to have the ability to fund research activities and for the Institute to be successful in its funding applications. At balance date the Council had no indication that operational and research funding would not be provided as per the funding agreements. Should unforeseen fluctuations in the amount of available grant funding occur the Council would use its cash assets (refer note 10) and managed fund investments (refer note 13) to cover short term operational cash requirements.

28. Future impact of accounting standards not yet effective

At the date of authorisation of the financial report, the expected impacts of new or amended Australian Accounting Standards issued but with future commencement dates are set out below:

AASB 1058 *Income of Not-for-Profit Entities* and AASB 15 *Revenue from Contracts with Customers*

The transition date for AASB 15 and AASB 1058 is 1 July 2019. Consequently these standards will first apply to the Council when preparing the financial statements for 2019-20.

The Council will adopt a modified retrospective approach to the adoption of these standards. Consequently, the comparatives will not be restated but rather an adjustment will be made to opening accumulated surplus at 1 July 2019 for the cumulative impact of the changes. Council has reviewed the impact of AASB 15 and AASB 1058 and identified the following impacts (or estimated where indicated) of adopting the new standards.

28. Future impact of accounting standards not yet effective (cont'd)

Grant revenue

The Council's competitive research grant funding agreements have been substantially identified as being enforceable and having sufficiently specific performance obligations, resulting in them falling under AASB 15. Grant revenue will continue to be recognised over time as the research activities are performed, with unearned revenue recognised for any unspent balance. Council's assessment is that there will be no material change to the recognition of competitive grant revenue.

Capital grants

If funds are received after the fact, such as a reimbursement, or there is no enforceable agreement or no identified specifications of the asset to be purchased or constructed, the revenue will continue to be recognised on receipt under AASB 1058. Council's assessment is that there will be no change to the recognition of capital grant revenue.

Donations revenue

Donations received are either general (non-tied to any specific area of research) or special purpose where the donor requests the funds be spent on specific research by a specific scientist. Council expects no change to revenue recognition on general donations.

Council currently treats special purpose donations as deferred revenue until those funds are spent by the scientist. However, there is no enforceable agreement, nor specific performance obligations, accompanying such donations so AASB 15 will not apply and the revenue will be required to be recognised immediately under AASB 1058.

The current unearned balance of special purpose donations is $3.1m, resulting in an impact on transition of a decrease of $3.1m in unearned revenue liabilities and increase of $3.1m in accumulated surplus.

Contract research revenue

Council currently recognises contract research revenue immediately when invoiced. Under AASB 15, revenue is required to be recognised as the performance obligations are delivered to the customer. The largest of Council's contract research contracts are for the provision of research services for specific time periods in return for revenue. Progress payments are generally invoiced by calendar quarters in advance; Council expects to recognise each payment over the period to which it relates. At transition to the new standard in the 2019/20 accounts, revenue invoiced in advance as at 30 June 2019 will be adjusted by $0.5m (increase in unearned revenue of $0.5m, decrease in accumulated surplus of $0.5m).

Up-front payments

Under AASB 15, where upfront revenue is received which is not linked to a specific performance obligation, even if non-refundable, the fee is considered to be a payment of revenue in advance for future goods or services. Consequently, that revenue is to be recognised as the goods/services are delivered to the customer.

The Institute has a 10 year licence agreement with a tenant whereby an upfront fee for the establishment of services has been received in prior years. Under the new standard, this fee is to be recognised over the 10 year period. A transition adjustment will be required on 1 July 2019 to recognise $3.25m as unearned revenue, offset by a decrease in accumulated surplus.

28. Future impact of accounting standards not yet effective (cont'd)

Other revenue

The Council expects no change to revenue recognition from other revenue sources including the Queensland Health grant, commercialisation, licence fees, rental, service and consulting fees.

AASB 16 *Leases*

This standard will first apply to the Council when preparing the financial statements for 2019-20. When applied, the standard supersedes AASB 117 *Leases*, AASB Interpretation 4 *Determining whether an Arrangement contains a Lease*, AASB Interpretation 115 *Operating Leases – Incentives* and AASB Interpretation 127 *Evaluating the Substance of Transactions Involving the Legal Form of a Lease*.

Impact for Lessees

Under AASB 16 the majority of operating leases (as defined by the current AASB 117) and currently shown at note 25(a) will be reported on the statement of financial position as right-of-use assets (ROUA) and lease liabilities where considered material.

The ROUA will be initially recognised at cost, consisting of the initial amount of the associated lease liability, plus any lease payments made to the lessor at or before the effective date, less any lease incentive received, the initial estimate of restoration costs and any initial direct costs incurred by the lessee. The ROUA will give rise to a depreciation expense.

The lease liability will be initially recognised at an amount equal to the present value of the lease payments during the lease term that are not yet paid. Current operating lease rental payments will no longer be expensed in the statement of comprehensive income. Operating leases will be apportioned between a reduction in the recognised lease liability and the implicit finance charge (the effective rate of interest) in the lease. The finance cost will also be recognised as an expense.

AASB 16 allows a 'cumulative approach' rather than full retrospective application to recognising existing operating leases. If a lessee chooses to apply the 'cumulative approach', it does not need to restate comparative information. Instead, the cumulative effect of applying the standard is recognised as an adjustment to the opening balance of accumulated surplus at the date of initial application.

Outcome of review as lessee

The Council has completed its review of the impact of adoption of AASB 16 and quantified the transitional impact on the statement of financial position and statement of comprehensive income of all material lease arrangements that will be recognised on-balance sheet under AASB 16 below:

Land

The Council's buildings are built on land owned by Metro North Hospital & Health Services (MNHHS). It is anticipated that Council will enter into a peppercorn lease for land occupied by the three buildings, for a 40 year term, with MNHHS in the reporting period ending 30 June 2020. Leases currently in place for the land occupied by Bancroft and CBCRC buildings (refer note 17) are to be terminated at this time.

Notes to the financial statements
For the year ended 30 June 2019

28. Future impact of accounting standards not yet effective (cont'd)

AASB 2018-8 *Amendments to Australian Accounting Standards – Right-of-Use Assets of Not for profit entities* provides for a temporary option for not-for-profit entities to elect to measure a class of right-of-use assets arising under concessionary leases at cost or fair value at initial recognition. Council expects to recognise a ROUA for lease with MNHHS at cost and include suitable disclosures in the 2019-20 annual financial statements. As the lease to be entered with MNHHS is a peppercorn lease and therefore not material there will be no recognition of the lease liability on the statement of financial position.

All other Australian accounting standards and interpretations with future commencement dates are either not applicable to the Council's activities, or have no material impact on the Council.

Notes to the financial statements
For the year ended 30 June 2019

NOTES ON OUR PERFORMANCE COMPARED TO BUDGET

29. Budgetary reporting disclosures

This section contains explanations of major variances between Council's actual 2018-19 financial results and the original budget which was approved by the Council on 26 March 2018.

Budget to actual comparison - Statement of comprehensive income

	Notes	Actual 2019 $'000	Original Budget 2019 $'000	Budget Variance 2019 $'000
Income from continuing operations				
Grants and other contributions		75,228	77,494	(2,266)
User charges and fees	a	30,165	36,163	(5,998)
Other revenue	b	12,537	7,923	4,614
Interest		649	750	(101)
Total Revenue		118,579	122,330	(3,751)
Gains on sale/revaluation of assets	c	13,899	5,224	8,675
Total income from continuing operations		**132,478**	**127,554**	**4,924**
Expenses from continuing operations				
Employee expenses	d	63,999	67,789	3,790
Supplies and services		33,362	34,703	1,341
Depreciation and amortisation		12,012	12,686	674
Other expenses	e	8,529	11,728	3,199
Finance costs		755	648	(107)
Total expenses from continuing operations		**118,657**	**127,554**	**8,897**
Operating result from continuing operations		**13,821**	**-**	**13,821**
Other comprehensive income				
Items that will not be reclassified subsequently to operating result				
Increase in asset revaluation surplus		-	-	-
Total other comprehensive income		**-**	**-**	**-**
Total comprehensive income/(loss)		**13,821**	**-**	**13,821**

29. Budgetary reporting disclosures (cont'd)

Budget to actual comparison - Statement of financial position

	Notes	Actual 2019 $'000	Original Budget 2019 $'000	Budget Variance 2019 $'000
Current assets				
Cash and cash equivalents	f	15,748	18,546	(2,798)
Receivables	g	8,339	3,464	4,875
Other financial assets	h	18,445	14,000	4,445
Inventories		258	253	5
Other current assets		1,220	207	1,013
		44,010	**36,470**	**7,540**
Assets classified as held for sale		525	-	525
Total current assets		**44,535**	**36,470**	**8,065**
Non-current assets				
Other financial assets	h	140,885	125,427	15,458
Property, plant and equipment		277,266	282,200	(4,934)
Intangible assets		280	292	(12)
Other non-current assets		5,949	-	5,949
Controlled and jointly controlled entities		275	523	(248)
Total non-current assets		**424,655**	**408,442**	**16,213**
Total assets		**469,190**	**444,912**	**24,278**
Current liabilities				
Payables	i	9,180	4,547	4,633
Accrued employee benefits		5,847	4,950	897
Unearned revenue	j	32,921	25,058	7,863
Total current liabilities		**47,948**	**34,555**	**13,393**
Total liabilities		**47,948**	**34,555**	**13,393**
Net assets		**421,242**	**410,357**	**10,885**
Equity		421,242	410,357	10,885
Total equity		**421,242**	**410,357**	**10,885**

Notes to the financial statements
For the year ended 30 June 2019

29. Budgetary reporting disclosures (cont'd)
Budget to actual comparison - Statement of cash flows

	Notes	Actual 2019 $'000	Original Budget 2019 $'000	Budget Variance 2019 $'000
Cash flows from operating activities				
Inflows:				
Grants and other contributions		73,667	78,129	(4,462)
User charges and fees	k	32,370	37,991	(5,621)
Other income		1,747	2,450	(703)
Interest income		649	750	(101)
GST input tax credits from ATO		3,516	-	3,516
GST collected from customers		1,934	-	1,934
Outflows:				
Employee expenses	l	(63,847)	(67,680)	3,833
Supplies and services	m	(39,380)	(43,548)	4,168
Finance costs		(755)	(648)	(107)
GST paid to suppliers		(3,267)	-	(3,267)
GST remitted to ATO		(1,987)	-	(1,987)
Other		(1,740)	(3,787)	2,047
Net cash generated by(used in)operating activities		**2,907**	**3,657**	**(750)**
Cash flows from investing activities				
Inflows:				
Redemptions of other financial assets	n	3,100	15,000	(11,900)
Net proceeds from sale of subsidiary	o	7,445	-	7,445
Sale of property, plant and equipment		26	-	26
Outflows:				
Investments in other financial assets		(10,278)	(9,300)	(978)
Acquisition of property, plant and equipment	p	(4,806)	(8,457)	3,651
Investment in related entity		(275)	-	(275)
Net cash used in investing activities		**(4,788)**	**(2,757)**	**(2,031)**
Cash flows from financing activities				
Inflows:				
Loans and advances redeemed from related entity	q	1,810	-	1,810
Outflows:				
Loans and advances made to related entity	q	(1,810)	-	(1,810)
Net cash used in financing activities		-	-	-
Net decrease in cash and cash equivalents		(1,881)	900	(2,781)
Cash and cash equivalents at beginning of financial year		17,629	17,646	(17)
Cash and cash equivalents at end of financial year		**15,748**	**18,546**	**(2,798)**

Notes to the financial statements
For the year ended 30 June 2019

29. Budgetary reporting disclosures (cont'd)

Explanation of major variances
Statement of comprehensive income

a. Income from the commercialisation of research outcomes was below budget by $5.1m due to the timing of reaching milestones.
b. The investment returns from fund earnings and distributions were 7.2% against a budget return of 4%, coupled with a higher fund balance, resulting in a favourable $5.8m variance.
c. The sale of subsidiary operations resulted in an unbudgeted net gain of $12.4m. Investment returns from market gains were below budget by $3.9m, with actual returns of 1% against a budget of 4%.
d. Employee expenses in 2018/19 were lower than budget due to savings in research support and administration functions for the year.
e Other expenses are below budget in 2018/19 due to lower payments of commercial funds to project collaborators ($2.6m).

Statement of financial position

f. Cash and cash equivalents balance reflects cash requirements to meet NHMRC grant funding rules. The budget estimated a higher level of funds required to support projected grant activity at year end.
g. The actual receivables balance represents an improvement compared to prior year but is below the favourable budget assumption. Franking credit receivables at 30 June 2019 are higher than budget by $1.1m.
h. The budget allowed for drawdowns from investments to fund research activities directly. Higher than budgeted net income has resulted in lower requirements to draw down investments in 2018/19. In addition, the actual opening balance was $3.9m higher than budgeted.
i. The payables balance is higher than budget as at 30 June 2019 due to additional works undertaken in June 2019 and accrued.
j. The value of unearned revenue balance is higher across both grants and contract research services due to timing differences between the receipt of grant income and expenditure being incurred.

Statement of cash flows

k. Cash inflows from commercialisation of research outcomes was below budget by $5.1m due to the timing of reaching milestones.
l. Employee expenses in 2018/19 were lower than budget due to savings in research support and administration functions for the year.
m Cash outflows on supplies and services are below budget due to timing on expenditure for research, consistent with the increased unearned revenue balance.
n Redemptions from other financial assets were $11.9m lower than budget due to the receipt of funds from the sale of subsidiary operations and lower than budgeted capital expenditure.
o. Net cash received from the sale of subsidiary operations, with the balance due in 2021.
p. Capital expenditure has been lower than budget on building renewal works and refurbishment and upgrade of cell manufacturing facilities. The creditor balance also includes a net increase of $0.5m in capital invoices outstanding at end of financial year.
q. Funds loaned to subsidiary operations during the year were repaid in full.

Notes to the financial statements
For the year ended 30 June 2019

WHAT WE LOOK AFTER ON BEHALF OF WHOLE-OF-GOVERNMENT AND THIRD PARTIES

30. Trust transactions and balances

(a) Trust II for the CRC for Vaccine Technology (CRCVT Trust II)

The Council was the Trustee of the CRC for Vaccine Technology Trust II (CRCVT Trust II), a trust responsible for managing patent families and licensing arrangements on behalf of the participants in the CRCVT since winding up in June 2006. Income received from licensing arrangements is distributed to the members in the trust according to their participating share in the CRCVT as of June 2006. The members of the CRCVT Trust II were: The Council of the Queensland Institute of Medical Research, CSIRO, CSL Limited, The University of Melbourne, Walter and Eliza Hall Institute of Medical Research, Monash University, Australian Red Cross Blood Service and La Trobe University.

During 2016-17 a Deed of Termination was entered into, with all the members agreeing to the distribution of the Trust Property in accordance with their participating share in the trust. The final distributions were paid out in full to participants during 2017-18 and the trust was terminated during the financial year.

As the Council performed only a custodial role in respect of these transactions and balances, they are not recognised in the financial statements but are disclosed in this note for the information of users.

	2019 $'000	2018 $'000
This is a summary of the financial transactions and balances for CRC for Vaccine Technology Trust II:		
Income	-	-
Expenses	-	(2)
Net deficit	-	**(2)**
Cash	-	-
Receivables	-	-
Net assets	-	-
Payables	-	-
Beneficiaries entitlements payable	-	-
Total liabilities	-	-
Trust net assets	-	-

CRCVT Trust II was not required to prepare financial statements for the year's ended 30 June 2019 and 30 June 2018, however, the transactions disclosed above have been audited. There were no external audit fees relating to the 2018-19 financial year (2018: $0).

The Council undertook certain custodial services on behalf of the Cooperative Research Centre Vaccine Technology Trust II (CRCVT) up to termination for which no fees were received by Council.

30. Trust transactions and balances (cont'd)

(b) Employee Research Services

The Council undertakes a custodial role in respect of transactions and balances relating to Employee Research Services (ERS). Transactions for ERS are not recognised in the financial statements but are disclosed in this note for the information of users. The balance of cash and cash equivalents excludes the balance of the ERS funds held in trust (refer to note 10).

This is a summary of the financial transactions and balances for Employee Research Services:

	2019 $'000	2018 $'000
Income	4,821	3,249
Expenses	(3,138)	(2,312)
Increase in net balance	**1,683**	**937**
Cash held in short term deposits	8,370	6,693
Total trust assets	**8,370**	**6,693**

The Council undertakes certain trustee transactions on behalf of employees' research activities, for which no fees are received by Council for providing such services.

Notes to the financial statements
For the year ended 30 June 2019

OTHER INFORMATION

31. Key management personnel (KMP) disclosures

(a) Key management personnel

The following details for key management personnel include those positions that had authority and responsibility for planning, directing and controlling the activities of the Institute during 2017-18 and 2018-19. Appointment is made by the Governor in Council under s5 & s10 of the *Queensland Institute of Medical Research Act 1945.*

The functions of the Council are to: (a) control and manage the Institute; (b) raise and accept moneys for the purposes of the Institute; (c) invest moneys raised and accepted by the Council for the purposes of the Institute; and (d) invest moneys derived from any property or other invested moneys of the Council for the purposes of the Institute.

Position	Incumbents term		2018-19	2017-18
	Date of initial appointment	Date of cessation		
Council members				
Dr Douglas McTaggart – Chair	27 Nov 2014	3 May 2019	√	√
Mr Christopher Coyne – Deputy Chair*	2 Jun 2005	3 July 2019	√	√
Mr Michael Sargent^^	27 Nov 2014		√	√
Emeritus Prof John de Jersey	27 Nov 2014	3 July 2019	√	√
Mr Ian Fraser	9 Aug 2012	3 July 2019	√	√
Assoc Prof Paula Marlton	16 Feb 2006	3 July 2019	√	√
Prof Alan Pettigrew	9 Sep 2011		√	√
Emeritus Prof John Shine	27 Nov 2014		√	√
Dr Jeannette Young^	20 Sep 2005	3 July 2019	√	√
Director/CEO				
Prof Frank Gannon^^#	4 Jan 2011		√	√

The newly elected Council members with responsibility from 4 July 2019 are Prof Arun Sharma – Chair, Dr Sonya Bennett^, Dr Madonna Callaghan, Ms Celeste Neander, Mr Mitchell Petrie, Ms Susan Rallings, Dr Clair Sullivan^ and Emeritus Professor Janet Verbyla.

* Acting Chair 3 May 2019 to 3 July 2019
^ Officer of the public service
^^ Also a Director of genomiQa Pty Ltd which is a controlled entity of Council (refer note 32)
# Also a Director of Endpoint IQ Pty Ltd which is a controlled entity of Council (refer note 32)

Position	Position responsibility
Council member	Overall authority and responsibility for overseeing, directing and controlling the activities of the Institute
Director/ CEO	Overall efficient and effective administration of the Council operations

31. Key management personnel (KMP) disclosures (cont'd)

(b) Remuneration policies

The Chairperson and members of Council receive sitting fees in line with the 'Remuneration of part-time Chairs and Members of Government Boards, Committees and Statutory Authorities' guideline issued by the Queensland Government. Any member of the Council who is an officer of the public service does not receive fees or allowances for attendance at a meeting of the Council.

The remuneration policy for the Director/CEO is set by Council and approved by the Governor in Council as provided for under the *Queensland Institute of Medical Research Act 1945*. The remuneration and other terms of employment for the Director/CEO are specified in the employment contract. The contract provides for the provision of other benefits including a motor vehicle.

The remuneration package for the Director/CEO comprises the following components:

i. Short term employee expenses which include:

- Base – consisting of base salary, allowances and leave entitlements paid and provided for the entire year or for that part of the year during which the Director/CEO occupied the specified position. Amounts disclosed equal the amount expensed in the statement of comprehensive income; and
- Non-monetary benefits – consisting of provision of living-away-from-home-allowance (2017-18 only), travel, vehicle and other minor benefits together with fringe benefits tax applicable to these benefits.

ii. Long term employee expenses include amounts expensed in respect of long service leave entitlements earned.

iii. Post-employment expenses include amounts expensed in respect of employer superannuation obligations.

iv. Termination benefits are not provided for within the Director/CEO's contract of employment. The contract of employment provides only for notice periods or payment in lieu of notice on termination, regardless of the reason for termination.

v. There are no performance bonuses paid or payable to the Director/CEO.

Key management personnel remuneration expense
The following disclosures focus on the expenses incurred by Council that is attributable to key management positions during the respective reporting periods. Therefore, the amounts disclosed reflect expenses recognised in the statement of comprehensive income.

Total remuneration is calculated on a 'total cost' basis and includes the base and non-monetary benefits, long term employee benefits and post-employment benefits. During either financial years no termination benefits have been paid and no KMP remuneration packages provide for performance or bonus payments.

Notes to the financial statements
For the year ended 30 June 2019

31. Key management personnel (KMP) disclosures (cont'd)

1 July 2018 - 30 June 2019

Position	Short term employee expenses		Long term employee	Post-employment expenses	Total expenses
	Monetary expenses $'000	Non-monetary benefits $'000	$'000	$'000	$'000
Chair of Council (1)	-	-	-	-	-
Council Members (7)	27	-	-	-	27
Director/CEO	646	42	16	82	786
Total	**673**	**42**	**16**	**82**	**813**

1 July 2017 - 30 June 2018

Position	Short term employee expenses		Long term employee	Post-employment expenses	Total expenses
	Monetary expenses $'000	Non-monetary benefits	$'000	$'000	$'000
Chair of Council (1)	-	-	-	-	-
Council Members (7)	26	-	-	-	26
Director/CEO	641	118	16	57	832
Total	**667**	**118**	**16**	**57**	**858**

The table above includes $12,000 in fringe benefits tax paid by Council in 2018-19 in relation to key management remuneration (2018: $82,000).

32. Controlled entities

(a) Q-Pharm Pty Ltd

In August 2014 Council acquired full ownership of clinical trials company Q-Pharm Pty Ltd, for-profit in nature. On the 31 January 2019 (date of sale), the Council sold all of it shares in Q-Pharm Pty Ltd to NN Bid Co Pty Ltd (2018: 100% of shares held). Q-Pharm Pty Ltd's registered office up to the date of sale was is in Brisbane, Queensland, with its activities also being conducted there.

Disclosure in prior periods under this note being "Controlled Entities" provided a comparative summary of the statement of comprehensive income and statement of financial position for Q-Pharm Pty Ltd.

32. Controlled entities (cont'd)

	2019 $'000	2018 $'000
Q-Pharm Pty Ltd		
Investment –at cost	-	23
	-	**23**

Associated with the disposal of Q-Pharm Pty Ltd in 2018-19, the following additional disclosures outline the resulting net gain on sale of these shares.

Transaction summary of shares sold in Q-Pharm Pty Ltd:	
NPV of share sale proceeds	13,603
Less:	
Investment – at cost	23
Debtor forgiven	326
Working capital adjustment	476
Transactional costs on sale	337
Net gain on disposal of shares	12,441

Q-Pharm Pty Ltd did not have any material contingent liabilities or commitments as at 31 January 2019.

As the results of Q-Pharm Pty Ltd are not consolidated into the results of the Council on the basis of materiality, the net loss for the 2018-19 financial year (2018: net profit) are not reflected in the Council's statement of comprehensive income.

(b) Vaccine Solutions Pty Ltd

Vaccine Solutions Pty Ltd was established in 1998, for-profit in nature, to provide clinical trial sponsorship, intellectual property management and commercialisation services to the Cooperative Research Centre for Vaccine Technology (CRCVT). Following the winding up of the CRCVT, Vaccine Solutions manages a number of licensing arrangements for the benefit of the members of CRCVT Trust II.

In July 2015 Council acquired full ownership of Vaccine Solutions Pty Ltd. As at 30 June 2019 the Council holds 100% of the shares of Vaccine Solutions Pty Ltd (2018: 100%). Vaccine Solutions Pty Ltd's registered office is in Brisbane, Queensland, with its activities also being conducted there.

Vaccine Solutions does not own any physical or intellectual property assets on its own and was required to return 97% of all commercial income received from licensing activities to the CRCVT Trust II for distribution to members of that trust. This trust was terminated during this financial year, refer note 30.

32. Controlled entities (cont'd)

	2019 $'000	2018 $'000
This is a summary of the financial transactions and balances for Vaccine Solutions Pty Ltd:		
Income	-	-
Expenses	-	-
Net surplus	**-**	**-**
Current assets	29	29
Current liabilities	(10)	(10)
Net assets	**19**	**19**

Vaccine Solutions Pty Ltd did not pay a dividend in 2018-19 (2017-18: $0).

Vaccine Solutions Pty Ltd was not required to prepare financial statements for the years 30 June 2019 and 30 June 2018, however, the transactions disclosed above have been audited. The company did not have any material contingent liabilities or commitments as at 30 June 2019 (similar as at 30 June 2018).

(c) genomiQa Pty Ltd

The Minister for Health approved the formation of genomiQa Pty Ltd in May 2017.

genomiQa Pty Ltd is for-profit in nature offering high-quality precision analysis of data from whole genome sequencing. As at 30 June 2019, the Council holds 66% of the shares in genomiQa Pty Ltd (2018: 66%). genomiQa Pty Ltd's registered office is in Brisbane, Queensland, with its activities also being conducted there.

genomiQa Pty Ltd		
Investment –at cost	275	-
	275	-
This is a summary of the financial transactions and balances for genomiQa Ltd:		
Income	219	10
Expenses	(339)	-
Net (loss)/surplus	**(120)**	**10**
Current assets	208	10
Current liabilities	(43)	-
Net assets	**165**	**10**

genomiQa Pty Ltd was not required to prepare financial statements for 30 June 2019 and 30 June 2018, however, the transactions disclosed above have been audited. The company did not have any material contingent liabilities or commitments as at 30 June 2019 (similar as at 30 June 2018).

Notes to the financial statements
For the year ended 30 June 2019

32. Controlled entities (cont'd)

(d) Q-Gen Pty Ltd

During the 2004-05 financial year, the Council incorporated a wholly owned subsidiary, Q-Gen Pty Ltd. The operations of Q-Gen Pty Ltd were wound up as at 30 June 2009 with activities of the entity being taken over by the Council. The entity still exists as a shelf company but is dormant. A letter confirming current dormancy has been issued by the sole director of Q-Gen Pty Ltd.

(e) Endpoint IQ Pty Ltd

The Minister for Health approved the formation of Endpoint IQ Pty Ltd in September 2018.

Endpoint IQ Pty Ltd is for-profit in nature offering bespoke research management systems to the health and research community. As at 30 June 2019, the Council holds 80% of the shares in Endpoint IQ Pty Ltd (2018: not yet registered). Endpoint IQ Pty Ltd registered office is in Brisbane, Queensland, with its activities also being conducted there.

	2019 $'000
This is a summary of the financial transactions and balances for Endpoint IQ Pty Ltd:	
Income	-
Expenses	-
Net surplus	**-**
Current assets	-
Current liabilities	-
Net assets	**-**

Accounting policy – Controlled entities
Controlled entities are entities over which the Council has the power to govern the financial and operating policies, generally accompanying a shareholding of more than one-half of the voting rights. Any controlled entities that are not considered as material are not consolidated with the Council's financial statements and the amount of the investment is recorded at cost.

As at 30 June 2019, the Council holds 100% (2018: 100%) each of directly controlled entities Q-Gen Pty Ltd, Vaccine Solutions Pty Ltd, 66% of genomiQa Pty Ltd (2018: 66%) and 80% in Endpoint IQ Pty Ltd. On 31 January 2019 Council sold its 100% holding in Q-Pharm Pty Ltd (2018: 100%). As the amount of the investments and the transactions of all entities are not considered material, they are not consolidated within the Council's financial statements.

The auditor for all controlled entities is the Auditor General of Queensland.

Notes to the financial statements
For the year ended 30 June 2019

33. Related party transactions

	2019 $'000	2018 $'000
Transactions with other related party		
Q-Pharm Pty Ltd		
The following transactions occurred with related party Q-Pharm Pty Ltd during the financial year 2018-19 up to the date of sale:		
Sales and purchases of goods and services		
Sale of scientific services to Q-Pharm Pty Ltd	430	261
Provision of temporary staff and related on-costs to Q-Pharm Pty Ltd	-	21
Purchase of clinical services from Q-Pharm Pty Ltd	47	180
Other transactions		
Cash advances (made and repaid within the year)	1,810	300
Trade reimbursements of third party expenses	121	96
Outstanding balances arising from sales/purchases of services and reimbursements		
The following balances are outstanding at the end of the reporting period in relation to transactions with Q-Pharm Pty Ltd:		
Current receivables (sales of services and trade reimbursements)	-	804

The Institute also provided, up to the date of sale, financial and administrative support services for Q-Pharm Pty Ltd. These services were not charged, and weren't considered material.

genomiQa Pty Ltd

The following transactions occurred with related party genomiQa Pty Ltd during the financial year 2018-19 up to the date of sale:

Sales and purchases of goods and services		
Provision of staff and related on-costs to genomiQa Pty Ltd	78	-
Other transactions		
Equity investments	275	-
Trade reimbursements of third party expenses	18	-

The Institute also provided administrative support services for. These services were not charged, and weren't considered material.

Endpoint IQ Pty Ltd

The Institute provided administrative support services for Endpoint IQ Pty Ltd. These services were not charged, and weren't considered material.

33. Related party transactions (cont'd)

Transactions with people/entities related to Key Management Personnel (KMP)

During the 2018-19 financial year Council's KMP did not enter into any transaction/arrangements with any related parties including close family members and entities controlled or jointly controlled by the KMP or a close family member. The 'Declarations of Related Party Information by non-Ministerial KMP' at 30 June 2019 support this disclosure.

Transactions with other Queensland Government–controlled entities

The Council receives an annual operational grant from the Department of Health, Queensland (Queensland Health). Refer notes 2 & 27.

The Council leases land from the State of Queensland (represented by Queensland Health) for two buildings at nominal rental. In addition, the Central Building, completed on 1 June 2012, occupies MNHHS land without a current lease in place. Refer note 17.

The Council undertakes a number of transactions such as employer superannuation contributions, WorkCover premiums, insurance payments to a range of Queensland Government controlled entities on normal terms and conditions.

The Council has short term cash on call funds invested in Queensland Treasury Corporation (QTC). Included in cash on call is $6.1m (2018: $5.4m) as at 30 June 2019. Refer note 10.

The Council has long term research funds invested in managed funds with QIC Limited (QIC). Refer note 13.

34. First year application of new accounting standards or change in accounting policy

Changes in accounting policy - AASB 9 *Financial Instruments*

The Council applied AASB 9 *Financial Instruments* for the first time in 2018-19. Comparative information for 2017-18 has not been restated and continue to be reported under AASB 139 *Financial Instruments: Recognition and Measurement.* The nature and effect of the changes as a result of adoption of this new accounting standard are discussed below.

Classification and measurement;

Under AASB 9 debt instruments are categorised into one of three measurement bases- amortised cost, fair value through other comprehensive income (FVOCI) or fair value through profit or loss (FVTPL). The classification is based on two criteria:

- whether the financial asset's contractual cash flows represent 'solely payments of principal and interest'; and
- the Council's business model for managing the assets.

The Council's debt instruments comprise of receivables disclosed in note 11. They were classified as Receivables as at 30 June 2018 (under AASB 139) and were measured at amortised cost. These receivables are held for collection of contractual cash flows that are solely payments of principal and interest. As such they continue to be measured at amortised cost beginning 1 July 2018.

34. First year application of new accounting standards or change in accounting policy (cont'd)

Equity instruments within the scope of AASB 9 are measured at FVTPL, with the exception that an equity instrument that's not held for trading can be irrevocably designated at FVOCI. Investments in subsidiaries, associates and joint ventures fall outside of the scope of AASB 9.

	AASB 9 measurement category (Balances at 1 July 2018)	
	Balances at 30 June 2018 $'000	Amortised cost $'000
AASB 139 measurement category		
Receivables		
-Trade and other receivables	10,174	10,174
	10,174	10,174

Impairment

AASB 9 requires the loss allowance to be measured using a forward–looking expected credit loss approach, replacing AASB 139's incurred loss approach. AASB 9 also requires a loss allowance to be recognised for all debt impairments other than those held at fair value through profit and loss.

On adoption of AASB 9's new impairment model, the Council did not need to recognise any additional impairment on its trade receivables. Below is a reconciliation of the ending impairment allowance under AASB 139 to the opening allowance under AASB 9.

	AASB 9 measurement category $'000	Impairment allowance 30 June 2018 $'000	Re-measurement $'000	Loss allowance 1 July 2018 $'000
AASB 139 measurement category				
Receivables				
-Trade and other receivables	Amortised cost	-	-	-
		-	-	-

Accounting standards early adopted for 2018-19

No Australian Accounting Standards have been early adopted for 2018-19.

35. Taxation

The Council is a State body as defined under the Income Tax Assessment Act 1936 and is exempt from Commonwealth taxation with the exception of Fringe Benefits Tax (FBT) and Goods and Services Tax (GST). FBT and GST are the only taxes accounted for by the Council. GST credits receivable from, and GST payable to the ATO, are recognised. Refer note 11. A complete legal review of the Institute's tax status has been undertaken and the charitable purpose of the Institute remains unchanged. The operation of the Institute's commercial activities and commercial business entities do not impact on the Institute's charitable status with the ACNC.

The Council of The Queensland Institute of Medical Research

Management Certificate
For the year ended 30 June 2019

Certificate of The Council of the Queensland Institute of Medical Research

These general purpose financial statements have been prepared pursuant to:
– section 62(1) of the Financial *Accountability Act 2009* (the Act),
– section 42 of the *Financial and Performance Management Standard 2009;*
– *Australian Charities and Not-for-profits Commission Act 2012; and*
– *other prescribed requirements.*

In accordance with section 62(1)(b) of the Act we certify that in our opinion:

a. the prescribed requirements for establishing and keeping the accounts have been complied with in all material respects; and

b. the financial statements have been drawn up to present a true and fair view, in accordance with prescribed accounting standards, of the transactions of The Council of the Queensland Institute of Medical Research for the financial year ended 30 June 2019 and of the financial position of the Council at the end of that year; and

c. there are reasonable grounds to believe that the Council of the Queensland Institute of Medical Research will be able to pay its debts as and when they become due and payable; and

The Council acknowledges responsibility under s 8 and s 15 of the *Financial and Performance Management Standard 2009* for the establishment and maintenance, in all material respects, of an appropriate and effective system of internal controls and risk management processes with respect to financial reporting throughout the reporting period.

Dated at Brisbane this 27th day of August 2019

Professor Arun Sharma	**Professor Frank Gannon**	**Donna Hancock**
Chair of Council	Director and Chief Executive Officer	Secretary

Queensland Audit Office
Better public services

INDEPENDENT AUDITOR'S REPORT

To the Council of the Queensland Institute of Medical Research

Report on the audit of the financial report

Opinion

I have audited the accompanying financial report of the Council of the Queensland Institute of Medical Research (the Council).

In my opinion, the financial report:

a) gives a true and fair view of the Council's financial position as at 30 June 2019, and its financial performance and cash flows for the year then ended

b) complies with the *Financial Accountability Act 2009*, the Financial and Performance Management Standard 2009, the *Australian Charities and Not-for-profits Commission Act 2012*, the Australian Charities and Not-for-profits Commission Regulation 2013 and Australian Accounting Standards.

The financial report comprises the statement of financial position as at 30 June 2019, the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, notes to the financial statements including summaries of significant accounting policies and other explanatory information, and the management certificate.

Basis for opinion

I conducted my audit in accordance with the *Auditor-General of Queensland Auditing Standards*, which incorporate the Australian Auditing Standards. My responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Report* section of my report.

I am independent of the council in accordance with the auditor independence requirements of the *Australian Charities and Not-for-profits Commission Act 2012* and with the ethical requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* (the Code) that are relevant to my audit of the financial report in Australia. I have also fulfilled my other ethical responsibilities in accordance with the Code and the *Auditor-General of Queensland Auditing Standards*.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Responsibilities of the Council for the financial report

The Council is responsible for the preparation of the financial report that gives a true and fair view in accordance with the *Financial Accountability Act 2009*, the Financial and Performance Management Standard 2009, the *Australian Charities and Not-for-profits Commission Act 2012*, the Australian Charities and Not-for-profits Commission Regulation 2013 and Australian Accounting Standards, and for such internal control as the Council determines is necessary to enable the preparation of the financial report that is free from material misstatement, whether due to fraud or error.

The Council is also responsible for assessing the entity's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless it is intended to abolish the entity or to otherwise cease operations.

Auditor's responsibilities for the audit of the financial report

Queensland Audit Office
Better public services

My objectives are to obtain reasonable assurance about whether the financial report as a whole is free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with the Australian Auditing Standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of this financial report.

As part of an audit in accordance with the Australian Auditing Standards, I exercise professional judgement and maintain professional scepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the financial report, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for expressing an opinion on the effectiveness of the Council's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Council.
- Conclude on the appropriateness of the Council's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Council's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial report or, if such disclosures are inadequate, to modify my opinion. I base my conclusions on the audit evidence obtained up to the date of my auditor's report. However, future events or conditions may cause the Council to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial report, including the disclosures, and whether the financial report represents the underlying transactions and events in a manner that achieves fair presentation.

I communicate with the Council regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

In accordance with s.40 of the *Auditor-General Act 2009*, for the year ended 30 June 2019:

a) I received all the information and explanations I required.

b) In my opinion, the prescribed requirements in relation to the establishment and keeping of accounts were complied with in all material respects.

29 August 2019

Carolyn Dougherty
as delegate of the Auditor-General

Queensland Audit Office
Brisbane

Compliance checklist

Summary of requirement		Basis for requirement	Annual report reference
Letter of compliance	• **A letter of compliance from the accountable officer or statutory body to the relevant Minister/s**	ARRs – section 7	3
Accessibility	• **Table of contents**	ARRs – section 9.1	4
	• **Glossary**		n/a
	• **Public availability**	ARRs – section 9.2	2
	• **Interpreter service statement**	*Queensland Government Language Services Policy* ARRs – section 9.3	2
	• **Copyright notice**	*Copyright Act 1968* ARRs – section 9.4	2
	• **Information Licensing**	*QGEA – Information Licensing* ARRs – section 9.5	n/a
General information	• **Introductory Information**	ARRs – section 10.1	6 — 13
	• **Machinery of Government changes**	ARRs – section 10.2, 31 and 32	(if applicable) n/a
	• **Agency role and main functions**	ARRs – section 10.2	5, 13, 21 — 24
	• **Operating environment**	ARRs – section 10.3	21
Non-financial performance	• **Government's objectives for the community**	ARRs – section 11.1	23 — 24
	• **Other whole-of-government plans / specific initiatives**	ARRs – section 11.2	n/a
	• **Agency objectives and performance indicators**	ARRs – section 11.3	25 — 31
	• **Agency service areas and service standards**	ARRs – section 11.4	n/a
Financial performance	• **Summary of financial performance**	ARRs – section 12.1	74
Governance – management and structure	• **Organisational structure**	ARRs – section 13.1	22
	• **Executive management**	ARRs – section 13.2	13 — 20
	• **Government bodies (statutory bodies and other entities)**	ARRs – section 13.3	n/a
	• ***Public Sector Ethics Act 1994***	*Public Sector Ethics Act 1994* ARRs – section 13.4	35
	• **Queensland public service values**	ARRs – section 13.5	35
	• **Risk management**	ARRs – section 14.1	35
Governance – risk management and accountability	• **Audit committee**	ARRs – section 14.2	18
	• **Internal audit**	ARRs – section 14.3	35 — 36
	• **External scrutiny**	ARRs – section 14.4	n/a
	• **Information systems and recordkeeping**	ARRs – section 14.5	37
Governance – human resources	• **Strategic workforce planning and performance**	ARRs – section 15.1	36
	• **Early retirement, redundancy and retrenchment**	Directive No.04/18 *Early Retirement, Redundancy and Retrenchment* ARRs – section 15.2	n/a

Summary of requirement		Basis for requirement	Annual report reference
Open Data	• **Statement advising publication of information**	ARRs – section 16	37
	• **Consultancies**	ARRs – section 33.1	https://data.qld.gov.au
	• **Overseas travel**	ARRs – section 33.2	https://data.qld.gov.au
	• **Queensland Language Services Policy**	ARRs – section 33.3	https://data.qld.gov.au
Financial statements	• **Certification of financial statements**	FAA – section 62 FPMS – sections 42, 43 and 50 ARRs – section 17.1	126
	• **Independent Auditor's Report**	FAA – section 62 FPMS – section 50 ARRs – section 17.2	127 — 128

FAA *Financial Accountability Act 2009*

FPMS *Financial and Performance Management Standard 2009*

ARRs *Annual report requirements for Queensland Government agencies*

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Interpreter