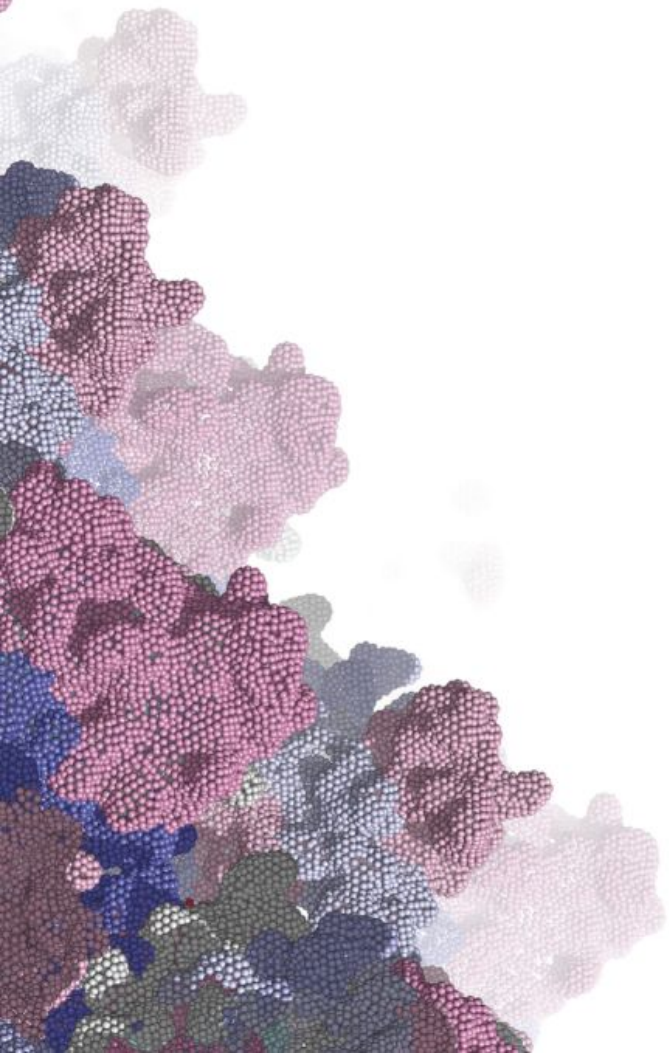
Walter+Eliza Hall
Institute of Medical Research

DISCOVERIES FOR HUMANITY

Extended Annual Report 2017

IMMUNE DISORDERS | CANCER | INFECTIOUS DISEASE

Contents



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Produced by the Walter and Eliza Hall Institute's Communications and Marketing department

We acknowledge the traditional owners and custodians of the land on which our campuses are located, the Wurundjeri people of the Kulin nation, and pay our respects to their elders past and present.

Our mission

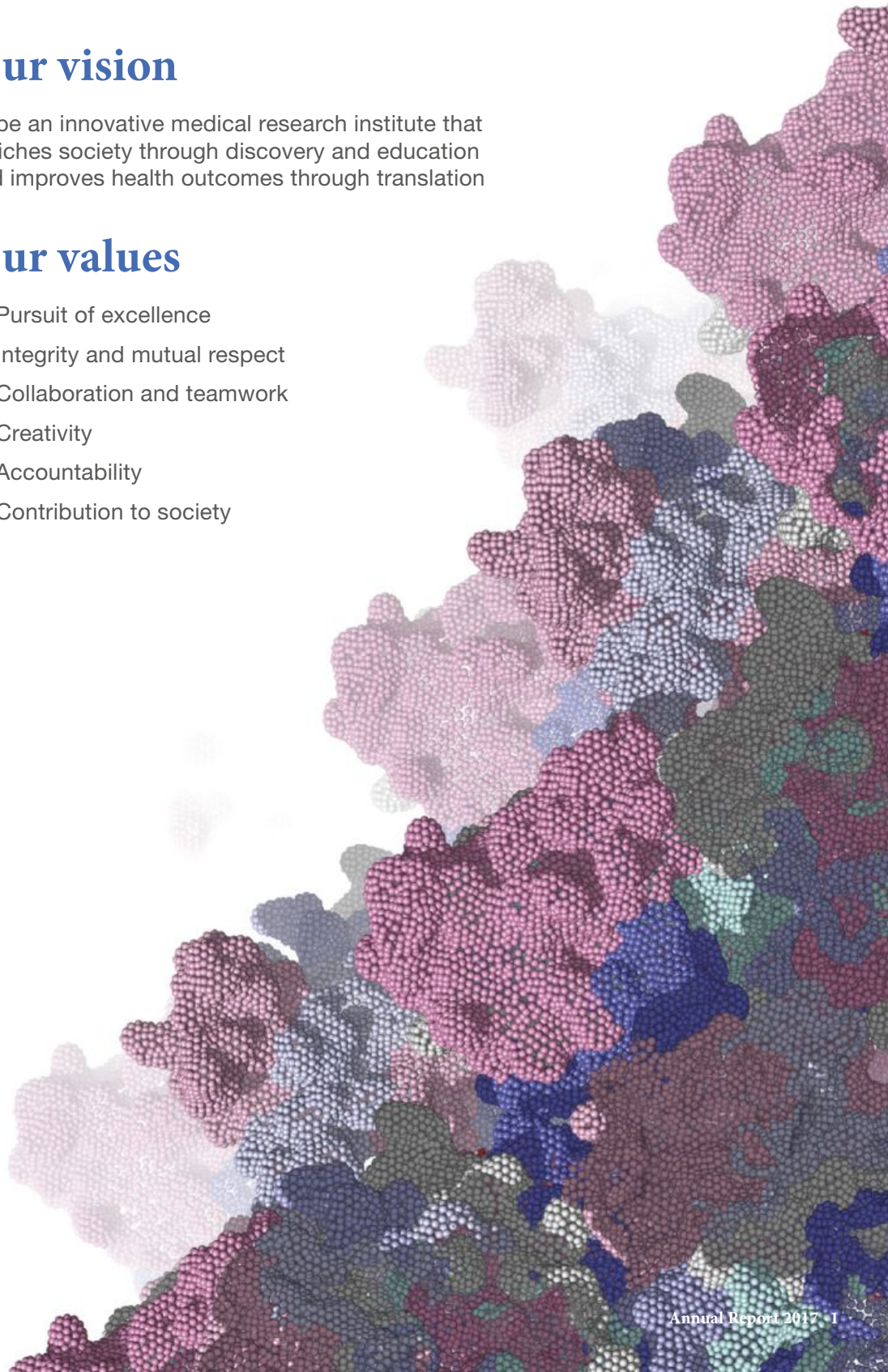
Mastery of disease through discovery

Our vision

To be an innovative medical research institute that enriches society through discovery and education and improves health outcomes through translation

Our values

- Pursuit of excellence
- Integrity and mutual respect
- Collaboration and teamwork
- Creativity
- Accountability
- Contribution to society



President's report

The past year was a landmark year for the Institute, with great progress in our research as well as in initiatives that will underpin our future research by providing the necessary infrastructure and financial stability.

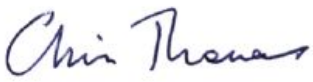
The Institute charted new territory in the Australian medical research landscape with the negotiation of the partial sale of royalty rights to the anti-cancer medication, venetoclax (see page 7). This has provided unique opportunities for growth and prudent investment, while also helping us manage the risks associated with longer-term volatility in the pharmaceutical marketplace.

A significant portion of this income was invested in the Institute's endowment to support the long-term financial stability needed for fundamental and translational research. The Institute has also invested in initiatives that will more immediately enhance our research capabilities, namely the acquisition of state-of-the-art dynamic imaging technology (see page 44); the establishment of the new Drug Discovery Centre to accelerate the discovery and translation of new medicines (see page 43); and the completion of our on-site Early Childhood Education and Care centre to open in mid-2018 as part of our commitment to supporting Institute staff and their families (see page 50). Partial royalty rights in venetoclax were also retained by the Institute, until global patents expire, to preserve potential future income opportunities.

Philanthropy remains a critical source of support in several key areas: funding for early-career researchers and their bold research ideas, and investments in equipment and technology. I extend my heartfelt thanks to all our donors, whose enthusiasm, commitment and support are an inspiration to everyone associated with the Institute. You can read more about the impact of our donors throughout this report.

The Institute fosters a very important connection between our researchers and consumers – people who have been impacted by a disease. Thanks also to these consumers for their valuable guidance and input into our research, and to our Consumer Advisory Panel, chaired by Dr Judith Slocombe AM, for overseeing their involvement.

Finally, I express my sincere gratitude to all board members for their commitment to the Institute. In particular, I offer my thanks and best wishes to Professor Ingrid Winship and Professor Rufus Black, who both retired from the board in 2017 after many years of service to the Institute. I also acknowledge the significant contributions being made by Professor Christine Kilpatrick and Professor Shitij Kapur as incoming board members.



Mr Christopher Thomas AM
President, Walter and Eliza Hall Institute of Medical Research

Director's report

Collaboration, a longstanding Institute value, was key to our achievements in 2017.

Many of our notable research discoveries were truly collaborative efforts: laboratory researchers and bioinformaticians joined forces to unravel breast cancer biology; partnerships with Royal Melbourne Hospital clinicians revealed new treatments for inflammatory diseases; and international collaborations spanning parasitology and chemistry discovered new vulnerabilities in the malaria parasite.

The landmark approval of anti-cancer agent venetoclax to treat patients in Australia was another achievement that arose from longstanding collaborations between Institute scientists, clinicians and industry partners. Our links to hospitals within the Victorian Comprehensive Cancer Centre were at the heart of this achievement, and I am confident that many other important discoveries will benefit patients in the near future through our partnerships.

Our close ties with the University of Melbourne are another important aspect of our research. In particular, our ability to train the next generation of exceptional medical researchers depends on our connections to the university, along with links with several leading universities in China. You can read about many of our students' achievements in the following pages.

Our links to the University of Melbourne were strengthened in 2017 by the establishment of the Lorenzo and Pamela Galli Chair in Medical Biology at the Walter and Eliza Hall Institute and the University of Melbourne. This role will be held by the Walter and Eliza Hall Institute director, and I am proud to be the inaugural Galli Chair, made possible through a generous donation by philanthropist and friend Mrs Pamela Galli.

The Australian and Victorian governments provided a positive environment for the medical research sector in 2017. Nationally, the Medical Research Future Fund began disbursing funding to priority research areas. A restructure of the National Health and Medical Research Council funding schemes was also announced, which I am confident will enhance how Australian research is funded. We are also grateful for support from the Victorian Government, with a substantial funding increase to the state's independent medical research institutes, plus support for the Walter and Eliza Hall Institute to develop a business case for a National Drug Discovery Centre (see page 43).

In 2017 we lost three valued members of the Institute community: Dr Colin Ward, an associate research fellow in our Structural Biology division; Mrs Avis McPhee, a pioneer of consumer advocacy and a generous donor; and Mrs Jo Metcalf, the wife of our late colleague Professor Don Metcalf and a dear friend to many as well as a supporter of our research. Valete Colin, Avis and Jo.

Professor Doug Hilton AO
Director, Walter and Eliza Hall Institute of Medical Research

About the Institute

The Walter and Eliza Hall Institute is Australia's oldest medical research institute. It was founded in 1915 with financial support from a trust established by Eliza Hall, following the death of her husband Walter. The vision was for an institute that 'will be the birthplace of discoveries rendering signal service to mankind in the prevention and removal of disease and the mitigation of suffering'.

Throughout the Institute's history its researchers have focused on understanding the fundamental principles of medical biology and using this knowledge to mitigate disease.

Our current researchers and students continue to work on solving basic science questions through curiosity-driven research. We are committed to innovative science that expands and improves our understanding of basic human biology and the disruptions to systems that cause disease. Our scientists also undertake blue-sky research that creates and explores new areas of biology.

Three nationally and globally significant areas of health have been long-term, central interests of our research:

- cancer – understanding the basic processes that are disrupted to generate cancer cells and how these can be targeted to treat disease;
- immune disorders – discovering how the body fights infection, and how errors in the immune system lead to disease; and
- infectious diseases – with a focus on globally significant pathogens, especially malaria and chronic infections.

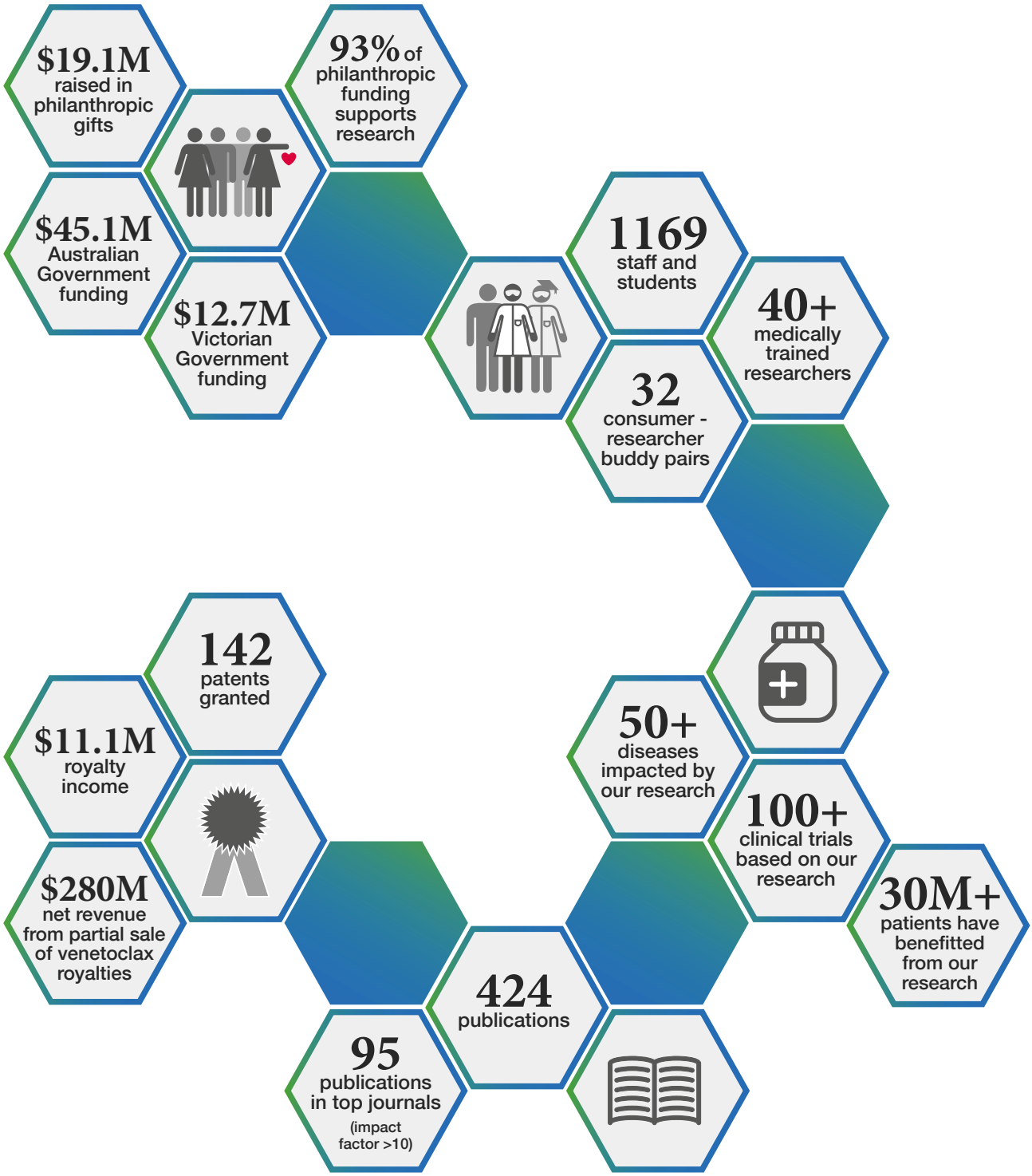
We take a multidisciplinary approach to addressing major research questions, integrating expertise in bioinformatics, clinical translation, computational biology, epidemiology, genomics, medicinal chemistry, personalised medicine, proteomics, structural biology and systems biology.

The Institute offers postgraduate training as the Department of Medical Biology of the University of Melbourne, and is affiliated with the University of Melbourne and The Royal Melbourne Hospital.

Below: In 2017 significant progress was made in the construction of the five-storey Early Childhood Education and Care centre (far left) on the Institute's Parkville campus.

Our Institute in 2017

With the support of our community, we are improving health outcomes.



Health impacts

The Institute is committed to making fundamental scientific discoveries that can be translated to better treatments, bringing real benefits to people on a global scale. Clinical trials based on discoveries made at the Institute include trials of vaccines for coeliac disease, diabetes and malaria; trials of new anti-inflammatory agents; and trials of a new class of anti-cancer drugs, called BH3-mimetics, for treating people with leukaemia and other cancers.

Cancer

- Bowel cancer
- Brain cancer
- Breast cancer
- Leukaemia
- Lung cancer
- Lymphoma
- Melanoma
- Myeloma
- Myeloproliferative disease
- Ovarian cancer
- Pancreatic cancer
- Prostate cancer
- Rare cancers
- Stomach cancer

Immune disorders

- Allergy
- Asthma
- Autoinflammatory diseases
- Coeliac disease
- Inflammatory bowel disease
- Lupus
- Multiple sclerosis
- Primary immune deficiencies
- Psoriasis
- Rheumatic fever and rheumatic heart disease
- Rheumatoid arthritis
- Sepsis
- Type 1 and type 2 diabetes

Infectious disease

- Ascariasis
- Filariasis
- Giardiasis
- Hepatitis B
- HIV
- Influenza
- Leishmaniasis
- Listeriosis
- Malaria
- Scabies
- Toxoplasmosis
- Tuberculosis

New anti-cancer treatment reaches leukaemia patients

In 2017 Australians with certain forms of leukaemia gained access to a potent new anti-cancer drug that was co-developed and trialled in Australia.

Venetoclax was the result of a research collaboration between the Institute and the companies AbbVie and Genentech, a member of the Roche Group. The drug was based on a discovery made at the Institute in the late 1980s that a protein called BCL-2 helps cancer cells to survive indefinitely.

Clinical trials of venetoclax showed remission in some patients with an advanced form of chronic lymphocytic leukaemia, for whom conventional treatment options had been exhausted. In 2017 venetoclax was approved for use by the Australian Therapeutic Goods Administration and made available to Australian patients, following similar approvals in Europe and North America.

Institute director Professor Doug Hilton AO said the Institute's commitment to scientific excellence, innovation and its collaborative culture underpinned the successful translation of venetoclax.

"We are very proud of the Institute's ongoing contributions to the realisation of this anti-cancer treatment and its potential to improve the lives of many patients around the world.

"Venetoclax demonstrates why investment in basic research is so important for future drug discovery and development," Professor Hilton said.

Institute secures landmark deal

In July 2017 Federal Minister for Health the Hon. Greg Hunt MP and Victorian Minister for Health the Hon. Jill Hennessy MP announced that the Walter and Eliza Hall Institute had made a landmark deal worth up to US$325 million from the partial sale of royalty rights in venetoclax.

CPPIB Credit Europe S.à r.l., a wholly owned subsidiary of Canada Pension Plan Investment Board, acquired rights to a portion of future venetoclax royalties owned by the Institute. The Institute retained partial royalties in the treatment.

A portion of the income was invested in the Institute's endowment, ensuring the long-term financial stability needed to continue the Institute's focus on fundamental and translational research. The funding will also support enhancing and accelerating the discovery and translation of new medicines (see page 43), acquisition of state-of-the art dynamic imaging technology (see page 44), and construction of the on-site Early Childhood Education and Care centre, as part of the Institute's commitment to supporting staff and their families (see page 50).

Professor Hilton said the deal demonstrated that the Institute has both the scientific determination and entrepreneurial acumen to take basic research all the way to being a clinical and commercial success, alongside our partners. "This need not be a one-time event. Venetoclax is proof that Australian institutions can be key players in globally significant translation.

"The Institute's mission is to make discoveries for humanity and this income will help us deliver on that. It will enhance and accelerate our ability to make fundamental discoveries that can be translated into better treatments, bringing real benefits to patients on a global scale, as well as benefiting the Australian economy," Professor Hilton said.

Further trials of venetoclax

Venetoclax was demonstrated through clinical trials to be a treatment for certain advanced forms of chronic lymphocytic leukaemia (CLL). It is now being trialled for its effectiveness in treating other types of cancer, and for use in combination with other cancer drugs.

Professor Andrew Roberts, head of Clinical Translation at the Institute, led clinical trials of venetoclax in Australia for treating some types of CLL and lymphoma. He and Peter Mac haematologist Professor John Seymour recently reported an international phase Ib clinical trial that looked at combining venetoclax with another anti-cancer drug, rituximab, for people with relapsed CLL.

Professor Roberts said more than half of the trial participants showed a dramatic reduction in leukaemia cells in their body, and that many of these patients show no sign of leukaemia recurrence several years later. "This trial established that venetoclax and rituximab can be safely combined," he said. "Its potential as an effective new combination therapy has prompted further trials of this approach to be undertaken.

"This was one of more than 50 clinical trials underway to test whether venetoclax could be used to treat a variety of blood cancers, as well as solid tumours such as breast cancer."

Professor Roberts is a clinician-scientist at the Institute and the University of Melbourne and a clinical haematologist at The Royal Melbourne Hospital and the Peter Mac. This and other venetoclax trials were conducted at the Peter Mac and The Royal Melbourne Hospital, the Institute's Victorian Comprehensive Cancer Centre partners.

Philanthropist provides boost for medical biology

Medical biology – the study of how our body works and what goes wrong when diseases occur, and how we can treat these diseases – is the cornerstone of modern healthcare and diagnostics, and is the focus of our Institute's research.

Philanthropist Mrs Pamela Galli provided a $5 million boost to medical biology with the establishment in 2017 of the Lorenzo and Pamela Galli Chair in Medical Biology at the Walter and Eliza Hall Institute and the University of Melbourne.

The Galli Chair is held by the Institute's director, Professor Doug Hilton AO, whose research focuses on blood cells. Professor Hilton said the generosity of Mrs Galli was an inspiration to researchers in the Parkville precinct.

"Mrs Galli has put her trust in us to improve health, in honour of her late husband," Professor Hilton said. "Her support allows us to focus on continuing our mission of translating discoveries in medical biology into better health outcomes for patients."

Supporting Australian medical research

Mrs Galli said her motivation for funding medical research was both "personal and altruistic". After losing her husband to skin cancer, Mrs Galli felt strongly compelled to support and advance medical research.

"It seemed appropriate to me that I should encourage medical research into disease after cancer took the life of my dear husband Lorenzo," Mrs Galli said. "I am convinced that the basic research and translation done at the Walter and Eliza Hall Institute are the backbone of future medical breakthroughs.

"I am impressed by what I observe of Professor Hilton's research into blood cells, his leadership of the Institute and his very real responsibility for the legacy from his predecessors. I am also inspired by his advocacy for gender equality and his encouragement of outstanding young researchers, which can be seen through initiatives such as the Institute's new Early Childhood Education and Care centre," Mrs Galli said.

Supporting research leaders

The Galli Chair is the third chair created by Mrs Galli at the University of Melbourne and one of its partner research institutions. Mrs Galli has also supported other research fellowships in the Parkville Biomedical Precinct, including the Lorenzo and Pamela Galli Centenary Fellowship at the Walter and Eliza Hall Institute.

University of Melbourne vice-chancellor Professor Glyn Davis AC said Mrs Galli's commitment to supporting research was extraordinary.

"Mrs Galli's gift of three professorial chairs is remarkable in the Australian university and medical research sector," Professor Davis said. "She has underpinned the continued successful partnership between the University of Melbourne and the Walter and Eliza Hall Institute and we will work closely together to honour her hope for the future."

Above: A generous gift from philanthropist Mrs Pamela Galli (left) has allowed the establishment of the Lorenzo and Pamela Galli Chair in Medical Biology, which will be held by Institute director Professor Doug Hilton.

Increasing community support for our medical research

We are very grateful to the growing number of donors who have chosen to support research at the Institute.

In 2017 the number of individuals supporting the Institute doubled, and many new donors came to us as a result of reading or hearing about our recent discoveries in the media. It is evident that Australians want to support smart scientists to make bold discoveries.

We also know that for most of our donors the motivation to support medical research is very personal and often the result of a family tragedy. Over the past year, we have received gifts from donors who have survived cancer and donors who have lost loved ones to cancer. We have received gifts from alumni and family members of our scientists. We have also received gifts from past and present board members.

Every donation comes with a personal story and offers not just support but inspiration to our researchers.

Every donation comes with a personal story and offers not just support but inspiration to our researchers. We want to thank you all for generously sharing your stories and generously supporting the Institute's research. In 2017 donors contributed more than $19.1 million to support our early-career scientists, fund innovative research projects and purchase essential technology.

We are very aware of the trust the community places in us to make the very best use of public money, whether it is government grants paid by your taxes or private donations from individuals and families.

We want to make sure that you – our donors – are informed about our research and engaged with the Institute in a way that best reflects your needs and interests. In 2017 we commissioned an independent donor satisfaction survey to make sure that the Institute is responding to donors respectfully, promptly and appropriately.

More than 84 per cent of respondents told us that they were very satisfied with the way the Institute's researchers and staff engaged with them. Our donors said that they particularly appreciated the way the Institute recognised donor support, provided information on how donations were spent, and offered choice when it came to communication.

Our donors also told us that they enjoyed participating in Institute events, with double the number of respondents attending donor events in 2017 compared with 2015. We hope to meet even more of our supporters at our events in 2018. We encourage you to take the opportunity to meet the Institute's researchers, hear about our research discoveries and tell us about your hopes for the future.

Together we can tackle some of the most significant health issues confronting humanity.

Our supporters

The supporters who make our discoveries possible

The advances in medical science at the Walter and Eliza Hall Institute are made possible by our generous supporters. We are proud to acknowledge these gifts, grants and bequests received from 1 January to 31 December 2017. Gifts of $1000 or more are acknowledged, unless otherwise requested by our donors.

The Institute also acknowledges the support of the Australian Government through schemes including the National Health and Medical Research Council and the Australian Research Council, and the Victorian Government.

Centenary Donors

Founding centenary donors

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L.E.W. Carty Charitable Fund
The Dyson Bequest
The Alfred Felton Bequest
The Stafford Fox Medical Research Foundation
The Walter and Eliza Hall Trust
Mrs Jane Hemstritch
Thwaites Gutch Trust of Ormond College
The University of Melbourne

Leadership centenary donors

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The Estate of Peter and Julie Alston
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Melbourne Water
The Metcalf Family
John T Reid Charitable Trusts
Gordon K Smyth
David Winston Turner Endowment Fund

Individual and family philanthropy

Transformational gifts

Anonymous (1)
Bendat Family Foundation Pty Ltd

Gifts up to $200,000

Anonymous (2)
Beck Family Foundation
The Isabel & John Gilbertson Charitable Trust
The Joan Marshall Breast Cancer Research Fund
Mr Colin North OAM and Dr Susan Alberti AC
Ms Jenny Tatchell
Mr Edward Vellacott and Mrs Morna Vellacott

Gifts up to $50,000

Mr Joe Bendror
Mrs Yvonne Butterfield
Brian M Davis Charitable Foundation
Mr Robert Evans and Mrs Meredith Evans
Mr Michael Harris and Ms Kelli Garrison
Mr Shane Quinn and Ms Elin Johansson
Mrs Heather Russell
Mrs Melanie Rae and Mr Neil Rae
RobMeree Foundation

Gifts up to $20,000

Anonymous (3)
Mr John Graty and Mrs Barbara Graty
Mrs Renate Harding
Mrs Elizabeth Leahy and Mr Philip Leahy
Mr Shane Murphy
Ms Marie McDonald
Mr Bob Munro
The Nossal Family Trust
Mrs Margaret Ross AM
Vinta Investment Management Pty Ltd
Ms Catherine Walter AM and Mr John Walter

Gifts up to $10,000

Anonymous (5)
Ms Sue Clifton
Dr Anne Colman and Professor Peter Colman AC
The Shirley Cuff Cancer Research Foundation
Dr Andrew Cuthbertson AO
Decerna Pty Ltd
Mr Geoff Gowers and Mrs Andrea Gowers
The Barbara Luree Parker Foundation Ltd
Craig Perkins Cancer Research Foundation
Mr David Reaburn
Mr David Williamson
Mrs Jean Williamson

Gifts up to $5000

Anonymous (8)
6A Foundation
Mr Angelo Bladeni
Mrs June Clapton
Ms Kaye Cleary
Mr John Edward Davies
Demak Timber and Hardware
Ms Kay Ehrenberg and Mr Scott Herne
Mr Cyril Evans and Mrs Pauline Evans
Mr Graham Gilpin
The Green Family
The Johnson Family Foundation
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Mr Brian Little
Dr Darren Lockie
Mr Brendan Madigan
Mrs Christine McConnell and Mr Denis McConnell
Ms Claire Murray
Professor David Penington AC
Mrs Olivia Quinn
Ms Caroline Richardson
Mrs Barbara Ruse and Mr Peter Ruse, Mr Adrian Ruse, Mr Christopher Ruse, Ms Nona Ruse, Ms Meaghan Heritage
Mrs Penny Stott
Ms Jenny Strangward
Mr Duncan Tuck

Gifts up to $2000

Anonymous (15)
Ms Elizabeth Abbott
Dr Peter Adams and Dr Sheryl Lawson
Mr John Allsop and Mrs Helene Allsop
Professor Emeritus Robin Anders and Dr Margot Anders
The Joan Elaine Barry Memorial Fund

Mrs Heather Beanland and Professor David Beanland
Con and Trish Boekel and Family
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Mr Bruce Cochrane and Mrs Helen Cochrane
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Mr Chris Thomas AM and Mrs Cheryl Thomas
Mr John Thornton and Mrs Gwynedd Thornton
Mr Robert Vance and Mrs Claire Vance
Mr John Walker QC and Mrs Angela Walker
Ms Heather White
Ms Marjorie Wilks
Mrs Heather Winneke

Community organisations

Australian Rotary Health
Berwick Opportunity Shop
Coolah Lady Golfers
Patch n Peace
Rotary Club of Eltham
Rotary Club of Melbourne
Rotary Club of Point Gellibrand
Rotary District 9810
Tarneit Skies Resident Association Inc
Twin Towns Services Community Foundation Limited
Yarra Yarra Golf Club

Community fundraisers

Ms Tash Edwards
Ms Melissa Bowyer
Ms Bev Bradford
Ms Gail Dawson
Ms Vanessa Dupond
Ms Sandra Gatt
The Lomond Hotel
Pink Hope
YLC Vic for Type 1 Diabetes research

Companies and institutions

American Universities International Programs
AMP Foundation
Australian China Education Foundation
Australia-China Council
Donald Cant Watts Corke
Goldman Sachs Matching Gift Program
Skysea Pty Ltd

Gifts in wills

(Listed by bequest amount)

Anonymous (2)
Estate of Alan G L Shaw
Estate of Pauline Speedy
Estate of Shirley June Rohan
Estate of Ellen Corin
Estate of Stephen Salo Beerman
Albert H Maggs Charitable Trust
Estate John Edward Uren
Estate of Janet MacLeod
Estate of Vivienne Paul
Estate of Sheila Mary Helpman
Estate Pamela J Barclay
Estate of Maxwell Gardiner Helpman
The Jakob Frenkiel Charitable Trust
Estate of Jean Margaret Williams
The Hazel & Pip Appel Fund
Estate of Joan Therese Matison
Estate of Margaret Cooper Holmes
The Margaret Stewardson Charitable Trust
Frederick and Winifred Grassick Memorial Fund
Irene & Ronald MacDonald Foundation
Estate of Eleanor Margrethe Albiston (The Stang Bequest)
Estate Janet Mary Lanigan
Estate of Ethel Mary Drummond
Estate Marion A I H M Spence
Estate of Jean Stocker
Estate of Florence Mary Young
The Baldy Trust Fund
Agnes Maude Reilly Charitable Trust
Estate of Lydia Robertson
Estate of Mary Isabelle Ball and John Mendip Ball
Estate Dorothy Mary Braund
The C.H. Boden Memorial Trust
Rigg Memorial Trust
GT & L Potter Charitable Trust
Estate of Emily Vera Winder
Estate of Evelyn Elder
Margaret Lewis Reilly Charitable Trust
John Frederick Bransden Charitable Trust
Estate of Rita Violet Sutherland
The Frank Broadhurst Memorial Charitable Fund
Estate of the late Doreen Merle Taylor
Thomas, Annie & Doris Burgess Charity Trust

International grants
(Listed by grant amount)

Grants of more than $500,000

Leukemia & Lymphoma Society, US
The Bill & Melinda Gates Foundation, US
The Marcus Foundation Inc., US
Ludwig Cancer Research, US

Grants of up to $500,000

Global Health Innovative Technology Fund, Japan
Howard Hughes Medical Institute, US
Human Frontier Science Program, France
Worldwide Cancer Research, UK
Harry J. Lloyd Charitable Trust, US
Cancer Research Institute, US
HJL Charitable Trust
Melanoma Research Alliance, US

Grants of up to $100,000

Foundation for Innovation New Diagnostics, Switzerland
JDRF, US
Coeliac UK
Wellcome Trust, UK
National Institutes of Health – National Institute of Allergy & Infectious Diseases, US
Lady Tata Memorial Trust, UK

Australian grants
(Listed by grant amount)

Cancer Council Victoria
Viertel Charitable Foundation
National Breast Cancer Foundation
JDRF Australia (through University of South Australia)
Leukemia Foundation Australia
Carrie's Beanies 4 Brain Cancer
The Jack Brockhoff Foundation
Cure Brain Cancer Foundation
Cancer Australia & Cure Cancer Australia
Coeliac Australia
Diabetes Australia
Royal Melbourne Hospital Foundation
DHB Foundation
Melanoma Research Alliance Foundation
The Phyllis Connor Memorial Trust
Motor Neurone Disease Research Institute of Australia
The Ian Potter Foundation
The Harry Secomb Foundation
John Theissen Children's Foundation
Harold and Pam Holmes Charitable Trust
FSH Global Research Foundation
ANZUP Cancer Trials Group
The Collie Foundation
Snowdome Foundation
Australian Cancer Research Foundation
Joe White Bequest
AUSiMED
Bethlehem Griffiths Research Foundation
Drakensberg Trust
Nancy E Pendergast Charitable Trust
Australian Centre for HIV and Hepatitis Virology Research
Australasian Gastro-Intestinal Trials Group
The Scobie and Claire Mackinnon Trust
The Financial Markets Foundation for Children
Shirley Brundrett Pancreatic Cancer Research Grant
Kidney Health Australia
The Thomas William Francis & Violet Coles Trust
Arthritis Australia
CASS Foundation
Royal College of Pathologists of Australasia Foundation
Lung Foundation Australia
Haemophilia Foundation Australia
The HMA Foundation
The Medical Advances Without Animals Trust (MAWA)
Prader Willi Research Foundation Australia
The Hermon Slade Foundation
Amelia Eliza Holland Trust
Rae Foundation
Bell Charitable Fund
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The Royal Australasian College of Physicians
Diabetes Vacccine Development Centre
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Founding gifts

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Professor David Gearing and Mrs Julie Gearing

Tribute gifts 2017

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Dr Michael Alpers
Professor Suzanne Cory AC and Professor Jerry Adams
Ms Roz Edmond
Ms Sharon Giblett
Ms Alison Neumaier
Mr Geoffrey Wratten
Ms Jenny Yeats
Ms Shayz Yuen

Exceptional science and people

Below: Clinician-scientist and Mathison Centenary Fellow Dr Maryam Rashidi is searching for new ways to treat inflammatory diseases such as lupus and psoriasis.

Bringing new therapy hope to brain cancer

Brain cancer is responsible for more deaths in people under the age of 40 than any other cancer, and more deaths in Australian children than any other disease. Our researchers are hoping to improve the treatments available for people with this devastating disease.

The immune system fights back

Immunotherapies – treatments that harness the body's own immune system to fight their cancer – have shown significant promise for treating several cancers, in particular melanoma and lung cancers. Dr Misty Jenkins leads a research team investigating whether immunotherapy could have the same impact in brain cancer.

> *"Brain cancer is exactly the type of disease that could potentially benefit from immunotherapy."*

Brain cancer has had no new therapies in decades, Dr Jenkins said. "Brain cancer often becomes resistant to conventional treatments or, due to the infiltrative nature of the disease, cannot be surgically removed," she said. "Brain cancer is exactly the type of disease that could potentially benefit from immunotherapy."

However using immunotherapy is a challenge in brain cancer, as the brain is particularly vulnerable to inflammatory side-effects associated with it.

"Our goal is to tailor immunotherapies to the brain in order to kill tumour cells without provoking harmful inflammation and side-effects in the healthy parts of the brain," Dr Jenkins said.

Dr Jenkins and colleague Dr Ryan Cross are investigating a type of immunotherapy in which a patient's immune cells are isolated, genetically modified to become 'super killer cells', and given back to the patient to fight their cancer.

Dr Cross said an exciting aspect of the research was that it aimed to initiate clinical trials. "These will test whether the cancer-fighting immune cells we generate are an effective treatment for brain cancer when given to patients," he said.

Dr Jenkins' laboratory and its exciting research have benefited from much-needed community support, including Carrie's Beanies 4 Brain Cancer Foundation, Cure Brain Cancer Foundation, Financial Markets Foundation for Children and the Robert Connor Dawes Foundation.

"Ultimately, we'd like to contribute our innovation to an area that could have the biggest impact – benefiting sick people and their families," Dr Jenkins said.

Above: Brain cancer researcher Dr Misty Jenkins (right) with Ms Carrie Bickmore, whose Carrie's Beanies 4 Brain Cancer Foundation is supporting Dr Jenkins' research into new brain cancer treatments.

Switching on cell death machinery

Medulloblastoma is a fast-growing brain cancer that primarily affects young children.

Professor Andreas Strasser, Associate Professor Anne Voss, Dr Francine Ke and Dr Kerstin Brinkmann are investigating whether 'switching on' the cell death machinery could be effective in treating medulloblastoma.

Professor Strasser said he hoped emerging drugs that switch on cell death machinery – called BH3-mimetics – would prove effective for medulloblastoma.

BH3-mimetics block the cells' in-built survival systems and have shown promise in other cancers, particularly leukaemia.

"The only current therapies for children with medulloblastoma are highly invasive with very significant and permanent side-effects on motor, sensory and cognitive function," Professor Strasser said.

"Our team is developing novel strategies to treat patients with brain cancer in a more effective and less invasive way with BH3-mimetics. Our hope is that we could achieve complete regression of the tumour and prolong survival without detrimental side-effects."

Only one in five people diagnosed with brain cancer will survive five years.

In the past 30 years the prognosis for people with brain cancer has not improved, despite improvements in the outcomes for many other cancer types.

New drugs for brain cancer

Dr Ruth Mitchell, a clinician PhD student at the Institute and trainee neurosurgeon at The Royal Children's Hospital Melbourne, is combining her clinical and research skills to improve the outlook for people with brain cancer.

Brain cancer had a devastating impact on the lives of patients and their families, Dr Mitchell said.

"I've watched my colleagues working with other cancers find new drugs and approaches that have changed the future for their patients," she said. "I want that for my patients."

Dr Mitchell's PhD studies, supported by the Royal Australasian College of Surgeons, investigated EGFR, a protein that is often overactive and mutated in brain cancer, and its role in causing cancers to grow.

"In the past decade new medicines that block EGFR have shown great promise for treating certain types of cancer. I am hopeful that we could one day see a similar impact for people with brain cancer," Dr Mitchell said.

Australians first in the world to trial new anti-cancer agent

A research partnership between the Institute, The Alfred Hospital and industry partner Servier has led to the first-in-human trials of a potential new anti-cancer agent.

The evasion of the normal process of cell death can lead to the development of cancer, and also renders cancer cells resistant to anti-cancer treatments.

It has been 30 years since Institute researchers made these discoveries. Intense worldwide efforts have subsequently focused on developing anti-cancer agents that restore cancer cells' susceptibility to cell death.

A significant focus has been on MCL-1, a pro-survival protein that is known to help more than a quarter of all cancers avoid cell death.

Clinical trials begin for blood cancers

Institute research teams collaborated with Servier on the development and testing of a new agent that inhibits MCL-1. In 2017 Servier's MCL-1 inhibitor entered clinical trials at Melbourne's Alfred Hospital.

"It was wonderful that Australian patients were among the first in the world to access this potential anti-cancer agent."

The treatment, which Servier is developing in collaboration with pharmaceutical company Novartis, is being trialled in patients with acute myeloid leukaemia, lymphoma and myeloma.

Associate Professor Guillaume Lessene said he was delighted to see the MCL-1 inhibitor enter clinical trials. "The Institute's three decades of expertise in cell death research and commitment to translational research collaborations underpinned this exciting advance. It was wonderful that Australian patients were among the first in the world to access this potential anti-cancer agent," he said.

Associate Professor Andrew Wei, the international clinical coordinator at The Alfred Hospital, said a pivotal milestone had been achieved. "We are now entering an exciting research phase, learning how best to use this new drug in patients with blood cancers and other human malignancies," he said.

Future combination therapies

Could MCL-1 inhibitors potentially be tested safely in combination with other anti-cancer agents? Professor Andreas Strasser is leading a research team investigating the safety of such combination treatments.

MCL-1 inhibitors may be able to enhance the sensitivity of cancer cells to conventional chemotherapy, Professor Strasser said. "However, if this was likely to cause damage to normal healthy tissues it would not be a safe approach to pursue in the clinic," he said.

"Studies in laboratory models by Dr Kerstin Brinkmann have suggested that MCL-1 inhibitors may be safely tested in combination with a wide range of chemotherapeutic agents. This will open avenues for testing many exciting combination treatments with the new MCL-1 inhibitor in patients with diverse cancers," Professor Strasser said.

Below: Dr Kerstin Brinkmann is part of a team of researchers investigating MCL-1 inhibitors as new treatments for cancer.

The new anti-cancer agent targets a protein that sustains growth of up to one quarter of all cancers.

Consumer buddies enhance research

The Institute's Consumer Buddy Program connects our researchers with people affected by disease. This is helping scientists and impacting the way research is being carried out at the Institute.

Bowel cancer researcher Associate Professor Oliver Sieber is contributing to new ways to diagnose and treat this disease. Before he put his name forward for the Consumer Buddy Program, Associate Professor Sieber said analysing patients' samples and data was the closest he got to the people he hoped his research would help.

"As a bench researcher you are generally removed from the actual patient – you rarely have the opportunity to speak to the people who might benefit from the research," he said.

Associate Professor Sieber was matched with bowel cancer survivor Ms Elaine Duxbury, with whom he regularly meets. Ms Duxbury helps review lay summaries as part of funding applications, and has been included as an associate investigator for ongoing projects.

Having Ms Duxbury as a buddy had given him a new perspective on his research, he said.

"The buddy program has been a unique opportunity for a deeper relationship. The personal stories of people affected by cancer give me added motivation and focus. I think that's very important because it's easy to get lost in what you're doing in the lab and lose sight of the human aspect," Associate Professor Sieber said.

A unique perspective

Ms Duxbury said she had experienced the worst effects of bowel cancer, having lost several close family members as well surviving the disease herself.

"This has given me a unique perspective of the world of cancer and thus gave me a reason to get involved with cancer advocacy," she said.

"I have gained a good insight into the exact research that Oliver's team is undertaking. If I can help Oliver in his research then that is great, if I can assist in his gaining grants that is even better.

"It is really heartening to be involved in this science, which will make a difference to bowel cancer in the future."

"It is also great to let others know about bowel cancer research that is underway – it gives them hope. It is really heartening to be involved in this science, which will make a difference to bowel cancer in the future," Ms Duxbury said.

The Institute supported 32 consumer-scientist buddy pairs in 2017.

Above: Bowel cancer survivor Ms Elaine Duxbury contributes to our research through the Institute's Consumer Buddy Program.

Spotlight on breast cancer

Breast cancer is the most common cancer affecting Australian women, with one in eight women being diagnosed with it by the age of 85. Our researchers are determined to improve the way breast cancer is diagnosed and treated, and to prevent this cancer before it develops.

New insights into cancer development

In the 20 years since Professor Jane Visvader and Professor Geoff Lindeman established the Institute's breast cancer laboratory, their research has unravelled the poorly understood biology of normal breast cells to understand how and why they become cancerous.

The breast cancer laboratory collaborates closely with colleagues across the Institute, including bioinformaticians who use their mathematical and computer modelling expertise to uncover the secrets of breast cancers.

In 2017 a collaboration jointly led by Professor Visvader, Professor Lindeman and bioinformatician Professor Gordon Smyth revealed new insights into the molecular changes that drive breast development.

Professor Smyth said the team focused on changes in breast cells before, during and after puberty, comparing which genes were expressed by the cells – their 'transcriptome'.

"We were able to apply our expertise in bioinformatics to distinguish the diverse populations of cells in the breast, revealing striking changes in the gene expression programs that contribute to breast development," he said.

Professor Visvader said the same approach could be applied to understanding which cells go awry in women at increased risk of developing breast cancer. "It provides a new way of investigating the different types of breast cancer in much greater depth, and has important implications for understanding how breast cancer arises," she said.

Above: Breast cancer researchers Professor Jane Visvader (right) and Professor Geoff Lindeman won the 2017 Victoria Prize for Science and Innovation in the Life Sciences.

The power of support

Community support has been vital for our breast cancer research.

In 2017 this support included funding from the Australian Cancer Research Foundation, The Collie Foundation, Cure Cancer Australia, the Lomond Hotel, Joan Marshall Breast Cancer Research Fund, National Breast Cancer Foundation, Pink Hope, The Qualtrough Cancer Research Fund, Rotary Club of Point Gellibrand, 6A Foundation and the Victorian and Australian Governments.

Professor Visvader said breast cancer impacted many people in the Australian community. "As the most common form of cancer diagnosed in women, most people know someone who has had this disease," she said. "Our long-term vision has always been to improve therapies for the prevention and treatment of breast cancer. It is exciting that we are now seeing our research benefit women in Victoria through clinical trials."

Women with a faulty* BRCA1 *gene have a 70 per cent lifetime risk of developing breast cancer.

Our breast cancer research has contributed to two clinical trials aiming to prevent or treat breast cancer in these women.

Breakthroughs lead to cancer trials

Translating research discoveries to health outcomes is an important focus of our breast cancer research, and several current clinical trials have their origins in our research.

One trial has arisen from research into how breast cancer could potentially be prevented in women with inherited mutations in the *BRCA1* gene, who have a 70 per cent lifetime risk of developing breast cancer.

The BRCA-P randomised phase 3 clinical trial, run in Australia by Breast Cancer Trials, will test whether denosumab could safely and effectively reduce the incidence of breast cancer in high-risk women with a faulty *BRCA1* gene. In 2017 the National Health and Medical Research Council (NHMRC) awarded almost $2.6 million to Professor Lindeman, who is also a medical oncologist at The Royal Melbourne Hospital and Peter Mac, and his team for this international study.

The trial is based on a study by our researchers in 2016, which showed that denosumab could switch off cell growth in breast tissue from women with a faulty *BRCA1* gene and curtailed breast cancer development in laboratory models.

"It is exciting that we are now seeing our research benefit women in Victoria through clinical trials."

In 2017 our researchers also revealed a potential new way to use immunotherapy to treat aggressive triple negative breast cancers, around 15 per cent of which arise in women with *BRCA1* mutations.

The study was jointly led by Professor Lindeman, Associate Professor Daniel Gray and Professor Visvader, with Professor Sherene Loi and Associate Professor Phil Darcy from Peter Mac.

Associate Professor Gray said the immunotherapy unleashed critical immune cells, enabling them to attack tumours. "We showed that combining anti-PD1 and anti-CTLA4 immunotherapies with chemotherapy halted the growth of the BRCA1-related tumours and significantly improved survival in laboratory models," he said.

The findings provide compelling evidence that clinical trials of combined immunotherapy should be considered in women with these breast cancers.

Professor Loi, who is also a medical oncologist, said plans were underway to progress a clinical trial of anti-PD1 and anti-CTLA4 immunotherapies, together with chemotherapy, in women with triple negative breast cancers.

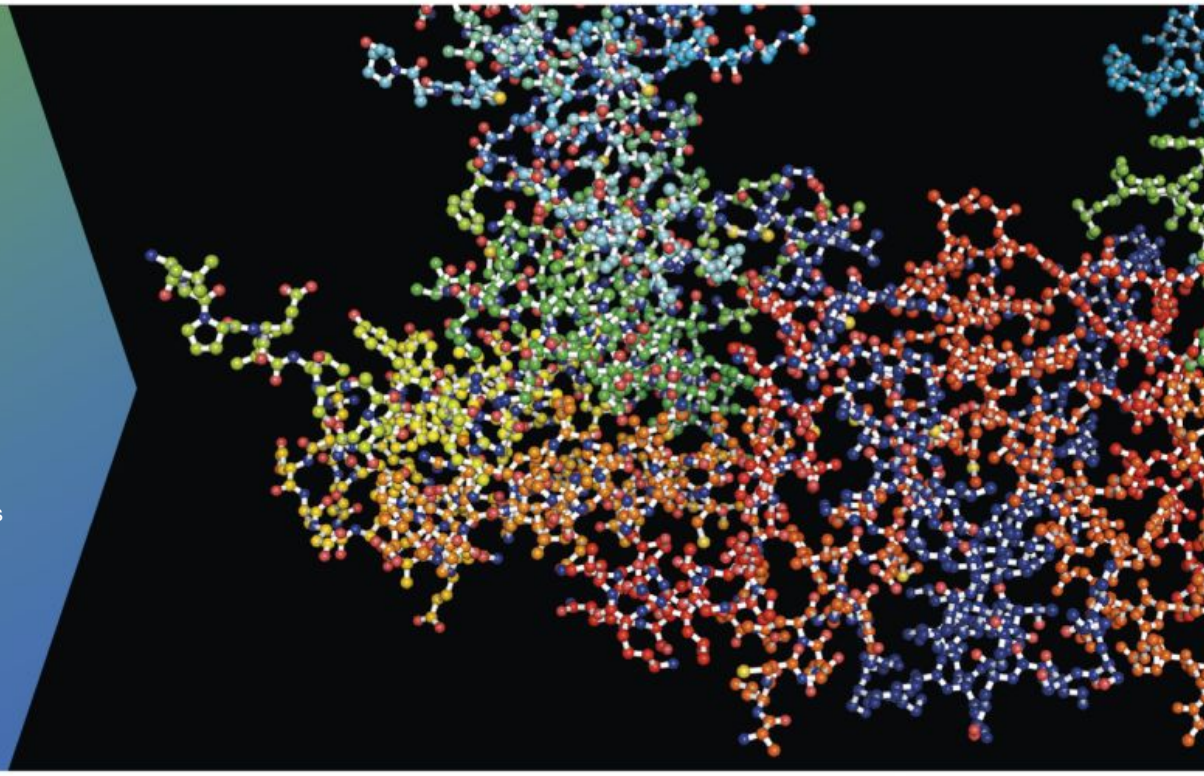
"This is a great example of how collaborations within the Victorian Comprehensive Cancer Centre support stronger links between the laboratory and the clinic," she said.

The CHARIOT trial, led by Peter Mac and run by Breast Cancer Trials Australia, will start soon at Peter Mac and the Victorian Comprehensive Cancer Centre in Melbourne, and six other sites around Australia.

What is structural biology?

Structural biology enables our scientists to visualise the three-dimensional (3D) structures of molecules involved in cancers, immune disorders and infectious diseases.

By mapping these molecules, scientists can explain how they function, how dysfunctional molecules cause disease, and engineer new medicines to fit the structure of 'target' proteins that drive diseases such as cancer or inflammatory conditions.



Molecule mapping guides new cancer treatments

A significant focus of Institute research is discovering new medicines and therapies based on a deep understanding of the molecules involved in disease. Understanding the structures of proteins is a valuable way to investigate their function, and to develop potential new structure-guided therapies.

Deploying immune cells against cancer

Immune cells detect infected or cancerous cells using receptors made up of clusters of proteins on the cell surface.

Working with collaborators in Spain and the US, Associate Professor Matthew Call and Dr Melissa Call discovered an important step in how these immune receptors are assembled.

Different combinations of proteins in the receptor complex influence how an immune cell responds when it makes contact with an infected or cancerous cell, said Associate Professor Matthew Call. "Our team identified the features of the proteins that allow these pieces to assemble in specific combinations," he said.

> *"We hope our discovery could underpin improvements in engineering immune cells to attack cancer."*

Understanding how immune receptors assemble could pave the way for future improvements in cancer immunotherapy, said Dr Melissa Call. "We focus on receptors that are important for immune cells to detect cancer cells," she said. "We hope our discovery could underpin improvements in engineering immune cells to attack cancer."

Charting new cancer treatments

The structure of a protein involved in the development and spread of aggressive breast, colon and pancreatic cancers could guide the development of new cancer treatments.

Dr Onisha Patel and Dr Isabelle Lucet used the Australian Synchrotron in Melbourne to generate the first map of the protein SgK223. This protein acts as a 'molecular scaffold', facilitating the assembly of vital signalling molecules, Dr Lucet said. "These molecules control the normal functions of a cell, such as cell shape and migration. High levels of SgK223 can jeopardise the normal functions of a cell and contribute to changes that lead to cancer," Dr Lucet said.

The unprecedented view of the structure of SgK223 revealed to the research team how the protein functions within cancer cells, Dr Patel said. "Our future research will focus on whether medicines targeting SgK223 could be developed as a potential new approach to treating cancers," she said.

Above: A 3D view of the protein SgK223 is providing clues to understanding this protein's functions in cancer cells.

Accolade for scientific leader

Professor Peter Colman AC was appointed a Companion of the Order of Australia, Australia's highest civilian honour, in the 2017 Queen's Birthday Honours List.

Professor Colman joined the Institute from CSIRO in 2001 to establish the Structural Biology division, which also included the Institute's first medicinal chemists. Trained in physics in Adelaide, Professor Colman has championed the use of X-ray crystallography to reveal the three-dimensional structures of proteins.

During his career, Professor Colman's research has underpinned the discovery of new medicines to treat influenza and cancer, which were designed to precisely bind critical proteins implicated in these diseases. In addition to his scientific achievements, the award recognised Professor Colman's leadership in translating scientific discoveries to improve treatment options for patients, and his mentorship of younger researchers.

Professor Colman led the Institute's Structural Biology division until his retirement as division head in 2017. He continues to lead a laboratory in the division.

More than 40 medically trained researchers work at the Institute.

Enhancing research translation for better health

Clinician-scientists enhance medical research at the Institute through their first-hand experience of medical practice and the needs of patients, as well as supporting valuable links between the laboratory and the clinic.

Improving therapies for testicular cancer

Testicular cancer is the second most common cancer in young men aged 18-39, however clinical studies of testicular cancer in Australia have been hampered by its relative rarity statistically, and when compared with other cancers.

Dr Ben Tran is developing a new online database, *iTestis*, to collate and analyse information about Australians with testicular cancer.

"*iTestis* will be a valuable resource for researchers in Australia to improve the treatments available for men with testicular cancer," Dr Tran said.

Dr Tran, a clinician-scientist at the Institute and medical oncologist at the Peter Mac, said many clinicians rely on overseas studies to inform their treatment decisions.

"It is challenging for one hospital to enrol sufficient Australian patients with testicular cancer to conduct a clinical trial, or for researchers to access enough tissue samples to undertake meaningful studies," he said.

A grant from the Below the Belt Research Fund, an initiative of the Australia and New Zealand Urological and Prostate Cancer Clinical Trials group (ANZUP), is enabling Dr Tran to establish a user-friendly, multidisciplinary database that will record current treatment practices and availability of clinical samples, increasing the possibility of recruiting Australian patients for clinical trials.

Scholarship supports myeloma research

Myeloma is an incurable blood cancer that develops from antibody-producing immune cells called plasma cells. Current treatments can only slow the growth of myeloma and, with an average life expectancy of four years after diagnosis, new therapies are urgently needed.

"As a clinician, I hope my research will lead to better outcomes for people with myeloma."

A Leukaemia Foundation Clinical PhD Scholarship has supported haematologist Dr Pasquale Fedele's investigations of how myeloma cells respond to recently developed classes of drugs.

Dr Fedele's PhD research discovered that immunomodulatory drugs (IMiDs) exploit a molecular pathway to make myeloma cells more susceptible to immune attack. "This revealed a potential for combining IMiDs with another new class of anti-myeloma drugs," he said.

Dr Fedele said it was exciting to be at the forefront of investigating new treatments for myeloma. "As a clinician, I hope my research will lead to better outcomes for people with myeloma."

Above: Clinician PhD student Dr Pasquale Fedele's research aims to improve the treatments available for myeloma, an incurable blood cancer.

Improving the lives of people with rare diseases

For PhD student and clinician Dr Fiona Moghaddas, improving the lives of her patients with autoinflammatory diseases is always the priority.

Dr Moghaddas is a PhD student at the Institute and clinical registrar at The Royal Melbourne Hospital. As part of her PhD she has established a national registry that she hopes will improve the lives of people suffering from autoinflammatory diseases.

The Australian Autoinflammatory Diseases Registry will provide clinicians and researchers with information about disease incidence and management, and help identify the genetic causes of autoinflammatory diseases.

Tracking down the cause

Autoinflammatory diseases, or periodic fever syndromes, are a group of rare diseases caused by changes in genes that regulate the immune system.

People with autoinflammatory diseases suffer seemingly unprovoked episodes of fever, rashes, joint swelling and other inflammatory symptoms, which can lead to long-term damage of vital organs.

While the genetic changes responsible for some autoinflammatory diseases are already known, there are still many patients who do not have a change in any of the known disease-causing genes.

Dr Moghaddas said not having an official diagnosis often led to great stress and uncertainty.

"Many of these families have seen multiple doctors, had a child who has been unwell for long periods of time and has missed large amounts of school and still can't get a definitive answer or diagnosis," Dr Moghaddas said.

"Being able to put a label on the disorder is a really important way for patients and their families to start to deal with this condition."

Patients are the priority

The registry offers genetic sequencing to people who have tested negative for all the known genetic changes. Finding a genetic cause can match people to more targeted treatments, improve prognosis, help with family planning and finally give a name to the disease.

"Being able to put a label on the disorder is a really important way for patients and their families to start to deal with this condition."

During her PhD, supervised by Associate Professor Seth Masters, Dr Moghaddas also investigated how novel genetic changes in people with autoinflammatory diseases lead to activation of the innate immune system.

But, even when she is in the laboratory, Dr Moghaddas' patients are always the priority.

"I feel as committed to the people I recruit to the registry as I do to patients that I physically see in clinic," she said.

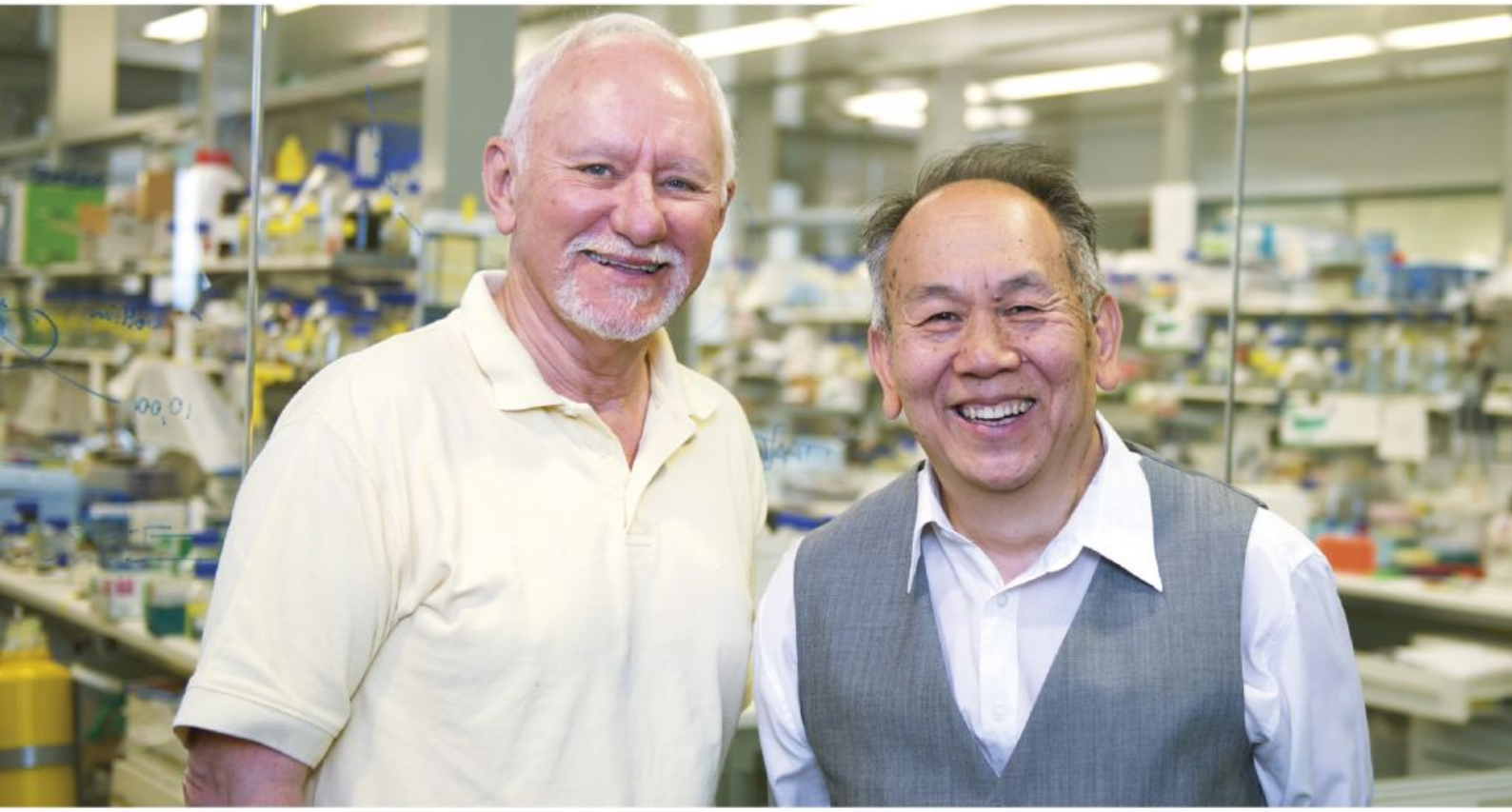
Below: Clinician PhD student Dr Fiona Moghaddas is investigating the gene changes that cause rare autoinflammatory diseases.

Researchers win top Institute award

The Institute's highest honour, the Burnet Prize, was awarded to cell death researchers Dr Gemma Kelly (right) and Associate Professor James Murphy in 2017.

Dr Kelly's research showed the protein MCL-1 is critical for the survival of many cancer cells. She is contributing to the translation of this finding as a new treatment for leukaemias and other cancers (see page 16).

Associate Professor Murphy discovered the mechanism by which the protein MLKL drives necroptosis, a type of inflammatory cell death. He is now leading development of drugs that target necroptosis for treating diseases including stroke, neurodegenerative diseases and cancer.



Improving outcomes for people with type 1 diabetes

Type 1 diabetes is an incurable immune disorder that destroys the pancreas' ability to produce insulin, a hormone essential to processing and storing sugar from our food. Our researchers are investigating the causes of type 1 diabetes, focusing on early detection and intervention.

Early detection key to preventing diabetes

Identifying risk factors for developing type 1 diabetes is an important way our researchers are improving the early detection and treatment of people with this disease.

Institute scientist Professor Len Harrison, who is also a clinician at The Royal Melbourne Hospital, led a team that developed immune screening tests for children and adolescents at risk of developing type 1 diabetes. The tests can identify more than 80 per cent of children and adolescents who will go on to develop type 1 diabetes, and are now in use in paediatric health centres in Australia.

"Early diagnosis and subsequent monitoring have allowed children to avoid acute, life-threatening complications of diabetes."

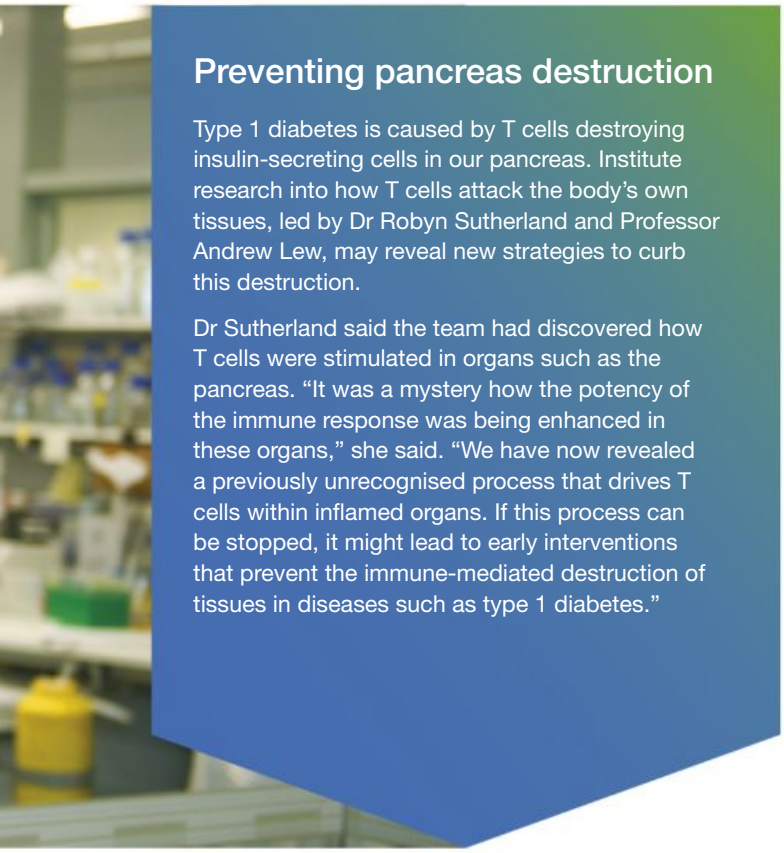
Professor Harrison said testing and identifying children with preclinical diabetes almost completely eliminated children presenting with acute, life-threatening disease at diagnosis. "Early diagnosis and subsequent monitoring have allowed children to avoid acute, life-threatening complications of diabetes. The tests have also allowed us to identify children who are candidates for clinical trials to prevent type 1 diabetes," Professor Harrison said.

"In 2017 we completed a trial that first screened more than 10,000 relatives of people with type 1 diabetes, to identify children at high risk. This has allowed us to test the effects of a nasal insulin immune therapy that may prevent type 1 diabetes from developing."

Funding support for early intervention

Diabetes research led by Professor Harrison and Professor Andrew Lew, with collaborators at St Vincent's Institute of Medical Research and The Westmead Institute for Medical Research, received a five-year, $9.5 million National Health and Medical Research Council (NHMRC) Program Grant to investigate new therapies for people in early stages of type 1 diabetes.

Diabetes Australia and YLC Victoria are funding Dr John Wentworth's investigations into a potential new treatment to delay or halt disease progression in people with early-stage type 1 diabetes. Dr Wentworth, who is also a clinician at The Royal Melbourne Hospital, said the support would allow his team to complete studies using a drug called empagliflozin in people who have just been diagnosed with type 1 diabetes to see whether it could preserve their pancreas function.



Preventing pancreas destruction

Type 1 diabetes is caused by T cells destroying insulin-secreting cells in our pancreas. Institute research into how T cells attack the body's own tissues, led by Dr Robyn Sutherland and Professor Andrew Lew, may reveal new strategies to curb this destruction.

Dr Sutherland said the team had discovered how T cells were stimulated in organs such as the pancreas. "It was a mystery how the potency of the immune response was being enhanced in these organs," she said. "We have now revealed a previously unrecognised process that drives T cells within inflamed organs. If this process can be stopped, it might lead to early interventions that prevent the immune-mediated destruction of tissues in diseases such as type 1 diabetes."

Above: Diabetes researchers Professor Len Harrison (left) and Professor Andrew Lew are leading collaborative research to develop early intervention therapies for type 1 diabetes.

More than 130,000 Australians have type 1 diabetes

Institute researchers have developed screening tests that can identify more than 80 per cent of children who will develop type 1 diabetes, and which are now in use in paediatric health centres in Australia.

Eating to prevent diabetes

The right diet may protect against type 1 diabetes, according to collaborative research involving Institute scientists.

The study showed that eating a diet high in the short-chain fatty acids acetate and butyrate, or a high-fibre diet that enhanced production of these short-chain fatty acids by gut bacteria, could prevent the development of type 1 diabetes in a laboratory model.

Professor Harrison, who contributed to the research, said changes in the Western diet had led to our gut bacteria becoming much less complex and diverse, and less able to protect against inflammatory diseases like type 1 diabetes.

"This approach of feeding short-chain fatty acids to mimic a super high-fibre diet is directly translatable to humans, and we plan to test this through a clinical trial in humans with type 1 diabetes," Professor Harrison said.

The study involved researchers from the Walter and Eliza Hall Institute, Monash University's Biomedicine Discovery Institute and CSIRO, with national and international collaborators.

How does our environment contribute?

For many years it has been thought that environmental factors – such as diet or exposure to certain infections – influence a person's risk of developing type 1 diabetes.

Professor Harrison and Dr Wentworth are lead investigators in the Environmental Determinants of Islet Autoimmunity (ENDIA) Study, the only study in the world that follows mothers from early pregnancy, and their offspring at genetic risk of type 1 diabetes, to understand how environment and genes interact to cause type 1 diabetes.

More than 1000 mother-infant pairs have now been recruited to the trial, Professor Harrison said. "We have observed significant changes in the 'gut microbiome' – the total diversity of bacteria living in the intestine – that are connected to developing type 1 diabetes. We are now investigating how the gut microbiome influences metabolism and the activity of genes regulating immune function," he said.

ENDIA is funded by the NHMRC, JDRF Australia and an anonymous international donor.

Regulating immune function for good health

Our immune system is vital for fighting infections in our bodies, but misdirected or overactive immune responses can harm our own tissues. Our researchers are uncovering the intricate controls that determine whether or not an immune response is launched, and how immune cells are constrained to prevent unwanted damage.

Crucial link found for protective immunity

A longstanding mystery of how viruses trigger protective immunity was solved by Institute research.

Dr Tan Nguyen, Dr Ken Pang and collaborators at the Institute, Hudson Institute of Medical Research and Harvard University, US, discovered a protein called SIDT2 was essential for cells to respond to viral components.

During a viral infection, RNA – a genetic material similar to DNA – is released into the environment around the infected cells. Viral RNA is detected by human cells as a warning sign of an active viral infection, Dr Nguyen said.

"Viral RNA is an important trigger for cells to establish an immune response to fight the virus," he said. "We showed for the first time that SIDT2 was crucial for transporting viral RNA within the cell, allowing it to trigger antiviral immunity."

Viruses have many strategies to evade immune detection, Dr Pang said. "Intriguingly, we discovered SIDT2 enables uninfected 'bystander' cells to detect viral RNA in their environment," he said. "This means bystanders can trigger protective immunity before they are infected by the virus."

In recognition of his scientific achievements, Dr Nguyen was honoured as a joint recipient of a 2018 Victorian Premier's Award for Science and Medical Research.

Keeping immune responses in check

Regulatory T cells (T-reg cells) control the strength of an immune response depending on the level of 'threat' from minor infections to aggressive diseases.

Without this regulatory influence, the immune system is at risk of overreacting to a minor threat, potentially contributing to the development of inflammatory diseases such as arthritis.

> *"This… could give new clues for treating harmful inflammatory diseases."*

Dr Sheila Dias and Professor Stephen Nutt, in collaboration with a team of immunologists and bioinformaticians, discovered that the protein Myb gives T-reg cells the 'authority' to control the strength of the immune response.

Dr Dias said Myb was vital for proper immune function. "Without Myb, T-reg cells could not control immune responses, resulting in severe inflammation. This provides a new insight into how our immune system works, and could give new clues for treating harmful inflammatory diseases," Dr Dias said.

Above: Dr Tan Nguyen (left) and Dr Ken Pang led research that discovered a critical step in how invading viruses trigger immune responses.

Targeting the causes of inflammatory diseases

Inflammation is an early defence that protects our body from infection, but many diseases are caused by ongoing or misdirected inflammation. Our research seeks to understand how inflammation is controlled, with a goal of developing new treatments for inflammatory diseases.

Soothing inflammatory skin conditions

Many inflammatory skin conditions, including eczema and psoriasis, can be triggered by the death of cells in the outer layer of the skin.

Skin inflammation relies on a protein called RIPK1, according to research led by PhD student Ms Holly Anderton, Dr Najoua Lalaoui and Professor John Silke, in collaboration with Professor George Varigos, a Royal Melbourne Hospital dermatologist.

> *"We hope that these drugs could offer relief to people with inflammatory skin conditions."*

The team investigated how to switch off skin inflammation by inhibiting cell death, Ms Anderton said. "Our work relied on a new laboratory model that has many similarities to a rare but fatal form of extreme skin inflammation triggered by certain viral infections or drug reactions," she said.

Dr Lalaoui said the team discovered that depleting RIPK1 prevented the skin inflammation. "This is exciting because medications that inhibit RIPK1 are already in clinical trials for other inflammatory conditions including psoriasis," Dr Lalaoui said. "We hope that these drugs could offer relief to people with inflammatory skin conditions."

Testosterone may reveal asthma treatment

One in nine Australians – around 2.5 million people – has asthma, an inflammatory airway condition that makes it difficult to breathe.

An international research collaboration has discovered that the hormone testosterone protects against developing asthma by suppressing the production of a type of immune cell that triggers asthma.

Professor Gabrielle Belz and Dr Cyril Seillet led the collaboration, with colleagues at the Institute and in France.

Professor Belz said the discovery helped to explain why females were two times more likely to develop asthma than males after puberty.

"We identified that testosterone is a potent inhibitor of innate lymphoid cells, a newly described immune cell that has been associated with the initiation of asthma," Professor Belz said.

"This discovery provides us with a potential new way to treat asthma, by targeting the cells that are directly contributing to its development. While more research needs to be done, it does open up the possibility of mimicking the effects of testosterone to treat or prevent asthma," she said.

Below: A link between cell death and inflammatory skin conditions was revealed by a research collaboration between PhD student Ms Holly Anderton (centre), Dr Najoua Lalaoui (right) and Professor George Varigos.

What is bioinformatics?

Bioinformatics applies mathematics, statistics and computer science to analyse complex biological data and to solve medical research questions.

Our bioinformatics researchers collaborate widely across the Institute, using their expertise to design and make sense of complex experiments. They also develop new and innovative mathematical approaches to solve research questions.

Bioinformatics: decoding medical research

Predicting cancer spread

Most cancer deaths are caused by tumours that have spread, a process called metastasis.

PhD student Ms Momeneh Foroutan and Dr Melissa Davis have investigated how cancer metastasis is driven by a protein called TGF-β. Using bioinformatics they pinpointed a gene 'signature' associated with TGF-β signalling and analysed thousands of cancer samples to reveal which tumours showed this signature, Ms Foroutan said.

"We discovered that tumours with this TGF-β gene signature had poor survival outcomes and often responded poorly to treatment," she said.

Dr Davis said predicting patients at risk of metastasis could enable proactive treatment to prevent their cancers spreading.

"There are already medicines available that block TGF-β signalling, so identifying cancers with this gene signature could be useful to assess whether patients might benefit from these cancer drugs," she said.

"Excitingly our research also identified other treatments that appear to be effective against cancers with active TGF-β signalling. Ultimately, our hope is that our research will be translated to the clinic to improve treatments for people with cancer."

The research earnt Ms Foroutan the award for the best PhD publication in 2017 across the University of Melbourne Medical School's Department of Surgery.

Incurable eye disease genes discovered

Macular telangiectasia type 2 (MacTel) is an incurable eye disease that can lead to blindness, mainly affecting people from the age of 40 on.

Professor Melanie Bahlo, Dr Thomas Scerri and PhD student Ms Anna Quaglieri led an international team that discovered the first evidence of genes that cause this rare and complex disease.

Professor Bahlo said the team analysed more than six million genetic markers and identified five genetic regions that had similar patterns in people with the disease.

> *"These five genetic risk loci are our 'treasure map', telling us where to keep digging in order to discover the specific genes implicated in MacTel."*

"These five genetic risk loci are our 'treasure map', telling us where to keep digging in order to discover the specific genes implicated in MacTel," Professor Bahlo said.

"We also discovered an exciting clue about the link between metabolic abnormalities and the onset of disease, which we are curious to explore further."

The finding will enable researchers to better understand MacTel and look for ways to slow or stop its progression.

Above: Bioinformatics PhD student Ms Momeneh Foroutan (left) and Dr Melissa Davis have uncovered a gene 'signature' in tumours that may lead to better outcomes for cancer patients.

Fellowship supports career development

Dr Kelan Chen – a recent PhD graduate at the Institute – revealed how a gene mutation contributes to the onset of a severe form of muscular dystrophy. The discovery could lead to new treatments for this devastating disease.

In 2017 Dr Chen won a National Health and Medical Research Council Early Career Fellowship to undertake postdoctoral research at the Lunenfeld-Tanenbaum Research Institute, Canada. The fellowship will support her to develop skills in structural biology and drug development.

Making progress in eliminating malaria

Malaria infects more than 200 million people worldwide each year and kills more than 400,000 people, predominantly pregnant women and children. Our researchers are working towards developing improved malaria vaccines and treatments in an effort to eradicate this disease.

Carbohydrates key for combatting malaria

The only malaria vaccine approved for use in humans has marginal efficacy that wanes over time. Our research into the biology of the malaria parasite is revealing potential new approaches for controlling malaria in the future.

Associate Professor Justin Boddey, Dr Ethan Goddard-Borger and colleagues have shown for the first time that carbohydrates on the surface of malaria parasites play a critical role in the spread of malaria between mosquitoes and humans.

"It may be that a version of the RTS,S malaria vaccine with added carbohydrates will perform better than the current vaccine."

Associate Professor Boddey said the team had shown the malaria parasite 'tags' its proteins with carbohydrates in order to stabilise and transport them, and that this process was crucial to the parasite completing its lifecycle, moving from mosquitoes to humans and back again.

"Interfering with the parasite's ability to attach these carbohydrates to its protein weakens the parasite to the point that it cannot survive in the mosquito or human host," Associate Professor Boddey said.

Dr Goddard-Borger said the finding has implications for improving malaria vaccine design.

The first malaria vaccine approved for human use – RTS,S/AS01 – has not been as successful as hoped.

"The protein used in the RTS,S vaccine mimics one of the proteins we've been studying on the surface of the malaria parasite that is readily recognised by the immune system," said Dr Goddard-Borger.

"With this study, we've shown that the parasite protein is tagged with carbohydrates, making it slightly different to the vaccine, so the antibodies produced may not be optimal for recognising target parasites.

"It may be that a version of the RTS,S malaria vaccine with added carbohydrates will perform better than the current vaccine," Dr Goddard-Borger said.

Reviving an old drug

Current drug treatments for malaria have serious side-effects and drug resistance means there is an urgent need for new treatments.

The antimalarial drug mefloquine has been used for more than 40 years, but exactly how the drug killed malaria parasites was unknown. The drug has also been associated with serious side-effects, including neurological symptoms.

Dr Wilson Wong, Dr Brad Sleebs and colleagues produced the first atomic map explaining one of the ways mefloquine works. The map revealed how the structure of mefloquine could be tweaked to make it both safer and more effective in killing malaria parasites.

The team used cryo-electron microscopy to visualise, in intricate detail, exactly how and where the drug binds the malaria parasite, Dr Wong said.

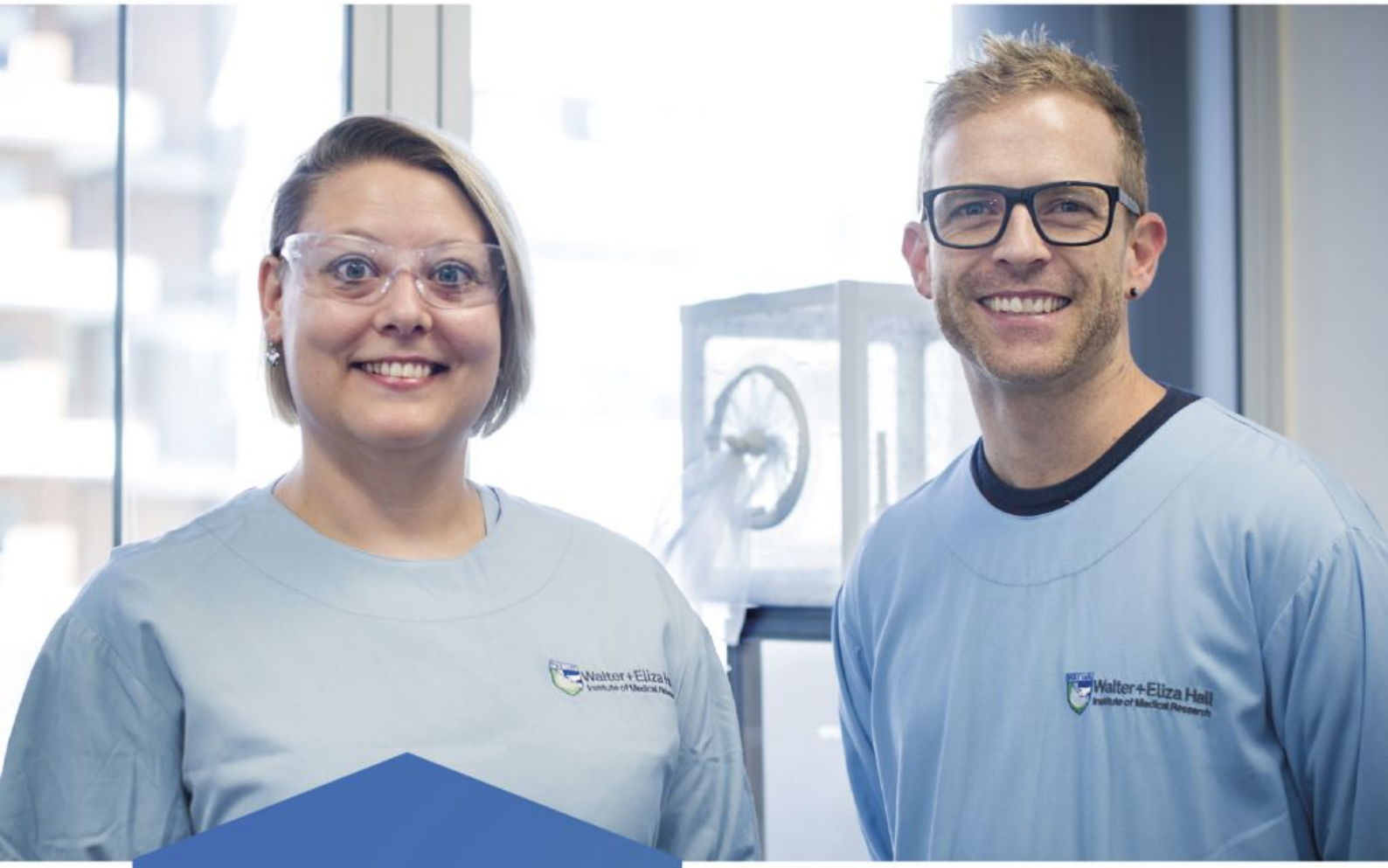
"We discovered that mefloquine attacks the ribosome – the molecular machinery that manufactures proteins required for malaria parasite survival," he said.

The atomic map showed the fit between mefloquine and the ribosome was not perfect, suggesting the drug could be redesigned to be more targeted and better differentiate between malaria and human ribosomes, Dr Sleebs said.

"Improving the action of mefloquine could lead to significant health benefits in a cheaper, faster way than developing an entirely new drug."

"If we could create a drug that targets this particular mode of action, it could be more effective at treating malaria," Dr Sleebs said.

"Improving the action of mefloquine could lead to significant health benefits in a cheaper, faster way than developing an entirely new drug. With resistance to frontline antimalarial drugs already growing, this is an important consideration."



Insectary accelerates discovery

Dr Sara Erickson manages the Institute's insectary, a facility that houses thousands of mosquitoes and enables Institute researchers to study all the developmental stages of human malaria parasites.

In the past, it was impossible to examine the earliest stages of human infection by malaria parasites at the Institute, Dr Erickson said. "The insectary enables us, for the first time, to specifically work with the parasites that initiate human infection," she said. "We hope this will fast-track identification of potential targets for antimalarial vaccines or drugs."

Since its establishment in 2012, our insectary has been critical to several discoveries at the Institute. This includes the identification of five parasite proteins that are key to how the parasite infects human cells, and the finding that carbohydrates are essential for the parasite's life cycle.

Nearly half of the world's population is at risk of contracting malaria.

Parasite resistance to antimalarial medicines has been documented in three of the five malaria species known to affect humans.

Above: The Institute's insectary, managed by Dr Sara Erickson (left), enables researchers including Associate Professor Justin Boddey (right) to study the earliest stages of malaria infection.

A champion of the Institute remembered

Feisty, passionate, direct and engaging, Ms Pauline Speedy touched many people during her lifetime; in death her legacy continues.

Barracking for science

Pauline's life was entwined with the Institute. She and partner Ms Jenny Tatchell began supporting the Institute many years ago, and became familiar faces at Institute events, ever eager to learn about the latest research.

Pauline liked to say that, in sports-mad Melbourne, she and Jenny had decided to "barrack for science".

Pauline's interest in medical research took a personal turn when, like her mother and sister, she developed breast cancer. Pauline survived the disease after undergoing surgery, radiotherapy and chemotherapy.

She also benefited from treatment with a drug made possible by an Institute discovery. Called CSFs (colony stimulating factors) the drugs boost the immune system after it has been weakened by cancer therapy. More than 20 million cancer patients have been treated with CSFs, researched over five decades by Professor Don Metcalf. Indeed, Pauline had the opportunity to meet Professor Metcalf to tell him how grateful she was for the discovery.

Pauline, a dear friend to the Institute and valued supporter, passed away suddenly in 2016. However, thanks to a bequest, her legacy at the Institute continues.

Passion for supporting the next generation

Pauline was passionate about supporting young scientists at the Institute. In 2018 Dr Vanessa Bryant will receive the Pauline Speedy Innovation Grant, joining previous recipients Associate Professor Wai-Hong Tham and Dr Ethan Goddard-Borger as beneficiaries of Pauline's wish to support the next generation of scientists.

Associate Professor Tham, the inaugural Pauline Speedy Innovation Grant recipient in 2016, said the early-career funding helped her gather the preliminary data needed to leverage a highly competitive US$650,000 Howard Hughes Medical Institute–Wellcome Trust award.

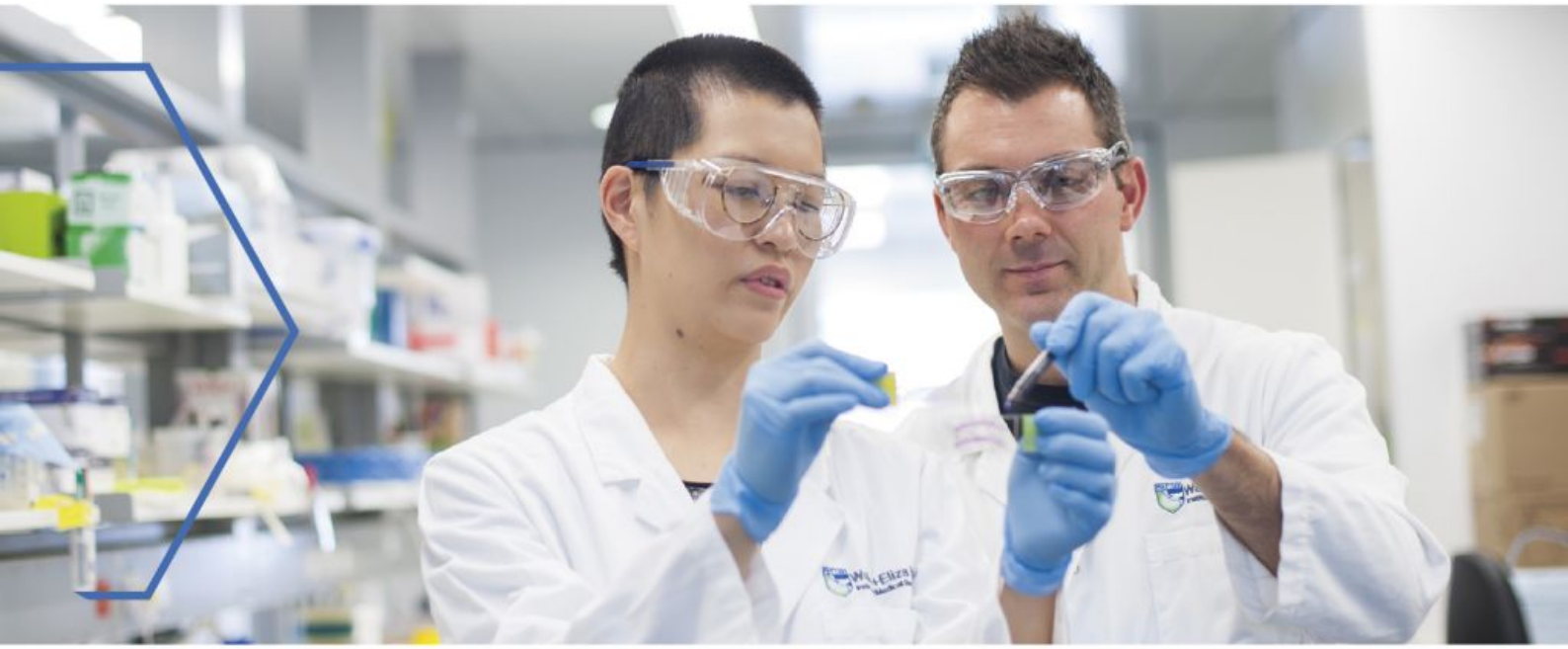
> *"Pauline's legacy will be seen through research achievements at the Institute for many years to come."*

"The Speedy Innovation Grant was pivotal for me to propel my discoveries to the point that I could compete on the international stage," Associate Professor Tham said.

"Pauline's legacy will be seen through research achievements at the Institute for many years to come."

Pauline's bequest also established the Speedy PhD Scholarship Fund, which from 2018 will support promising PhD student Ms Rachel Joyce and her breast cancer research. Pauline's generous bequest also contributed to the Institute's Early Childhood Education and Care centre, opening in 2018.

Below: Malaria researcher Associate Professor Wai-Hong Tham (left) was the first beneficiary of a Speedy Innovation Grant, made possible by the late Ms Pauline Speedy (right).



Honours student tackles a neglected disease

Ms Joy Liu was the winner of the Institute's 2017 Colman Speed Medal, awarded to the top Honours student each year. Her Honours project enhanced our understanding of a neglected parasitic disease, potentially informing the development of future therapies.

A problem affecting billions

More than one billion people worldwide are infected with parasitic *Ascaris* worms. Most infected people are not aware they carry this parasite, which is transmitted by faecal contamination of soil. However people with a heavy infestation – especially children – can be malnourished, develop intestinal blockages and other organ damage, and may even experience permanent physical and cognitive stunting.

The current options for preventing and treating *Ascaris* infections are limited, Ms Liu said. "There are also concerns *Ascaris* worms could become resistant to the available drugs," she said. "New drugs to treat *Ascaris* or, ideally, a vaccine to provide lifelong immunity are desperately needed."

Chemical 'sensing'

Ms Liu, supervised by Associate Professor Aaron Jex and Dr Kelly Rogers, investigated how *Ascaris* sense chemicals in their environment – an ability called 'chemosensory perception' – which enables the parasites to communicate, detect food and locate new hosts.

"We took two approaches to studying chemosensory perception," Ms Liu said. "We used imaging to visualise chemosensory structures, and bioinformatics to discover whether *Ascaris* worms have similar chemosensory systems to a well-studied laboratory model worm *C. elegans*."

Working with Dr Rogers, who heads the Institute's Centre for Dynamic Imaging, Ms Liu developed a new technique to visualise structures within the worm's head. "I hope this will enable future high-resolution images of the neurons used for chemosensory perception," Ms Liu said.

> *"It is breathtaking to visualise biology in real-time and in intricate detail. There is nothing more powerful."*

"Our bioinformatics studies showed *Ascaris* lacks many of the key chemosensory molecules found in *C. elegans*. We concluded *Ascaris* has potentially evolved unique ways to detect chemicals – and these may be excellent drug targets," Ms Liu said.

Translating imaging skills to cancer

In 2018 Ms Liu will extend her imaging skills through PhD studies at the Institute, using microscopy to track the growth of cancer.

"During my Honours year I was amazed by how rapidly the field of imaging is advancing. It is breathtaking to visualise biology in real-time and in intricate detail. There is nothing more powerful, nor more convincing, than being able to observe a biological phenomenon as it occurs," she said.

Above: Honours student Ms Joy Liu (left) and her supervisor Associate Professor Aaron Jex have investigated potential drug targets for a parasite that infects one billion people worldwide.

Connecting diseases with cell development

Cells are the building blocks of our body, and faults within different cells can lead to distinct diseases. Our researchers are discovering how different cell types develop from 'parents' called stem cells, and how errors in this process cause diseases including cancer.

Institute joins world-first Human Cell Atlas effort

The Human Cell Atlas is a bold effort to map every single cell in the human body for a freely accessible database, a resource that could revolutionise how diseases are understood, diagnosed and treated. The Institute and 13 other Australian centres are founding collaborators in an Australian consortium formed to contribute to the Human Cell Atlas.

> *"I believe the Human Cell Atlas has the potential to further propel translational discoveries and drive a new era of medicine."*

Institute cell biologist Dr Shalin Naik, who is a member of the Human Cell Atlas organising committee, said the project is a sequel to the Human Genome Project.

"The Human Genome Project catalogued the first full human DNA sequence, and led to many medical success stories. I believe the Human Cell Atlas has the potential to further propel translational discoveries and drive a new era of medicine," Dr Naik said.

Bone marrow crosstalk may impact lymphoma formation

Immune B cells and platelets are two types of blood cells that are formed in the bone marrow, via two distinct and well-defined pathways. Dr Emma Josefsson and her colleagues have revealed that there may be previously unrecognised 'crosstalk' between these processes, which could influence blood cancer formation.

Dr Josefsson's research centered on the hormone thrombopoietin (TPO), which tightly regulates platelet production, and whether it could also impact B cell development.

Varying the levels of TPO in model systems altered the production of early B cell precursors, Dr Josefsson said. "We also revealed that modulating TPO indirectly impacts the development of lymphoma, a cancer of B cell precursors. We are now focusing our research on understanding interactions between platelets and lymphoma cells," she said.

Below: Dr Shalin Naik is leading Australia's contribution to the global Human Cell Atlas project.

Protein's link to leukaemia revealed

Many diseases can be attributed to abnormalities in proteins that control normal processes within our body.

During her PhD studies, Ms Helen McRae examined a protein associated with some types of leukaemia, as well as a rare intellectual disability syndrome.

Ms McRae discovered the protein played an important role in controlling stem cells that sustain blood cell production. She also demonstrated that loss of this protein accelerated the rate of development of leukaemia, in particular when combined with mutations in other genes.

Above: Ms Helen McRae (right) with PhD supervisors Associate Professor Anne Voss (left) and Associate Professor Tim Thomas.

2017 Graduates

Congratulations to the following students who successfully completed their studies this year.

Doctor of Philosophy, The University of Melbourne

Dr Raed Alserihi
Collaborating events in Lmo2-driven T-cell leukaemia
Dr Matthew McCormack, Professor Warren Alexander

Dr Chow Hiang Alex Ang
Role of nucleophosmin (NPM1) in normal haematopoiesis and acute myeloid leukaemia
Professor Paul Ekert, Professor Warren Alexander

Dr Brandon Aubrey
Investigating the role of mutant p53 in the development and sustained growth of c-Myc-driven lymphoma
Dr Gemma Kelly, Professor Andreas Strasser

Dr Daniel Cameron
Improving the detection of genomic rearrangements in short-read sequencing data
Professor Tony Papenfuss, Professor Terry Speed

Dr Bianca Capaldo
Investigation of luminal lineage regulation using an RNAi screening strategy and human breast-derived iPSC lines
Professor Jane Visvader, Professor Geoff Lindeman

Dr Simon Chatfield
Neutrophil extracellular trap-associated cell death – role in gout and relationship to alternated forms of cell death
Professor Ian Wicks, Associate Professor James Murphy

Dr Hui San Chin
Nuances and complexities of cell death control
Dr Mark van Delft, Dr Seong Lin Khaw, Professor David Huang

Dr Chris Chiu
Defining the antigenic targets of naturally acquired immunity to *Plasmodium falciparum*
Dr Diana Hansen, Professor Alan Cowan, Professor Ivo Mueller

Dr Stephanie Conos
The role of cell death in interleukin-1beta activation and secretion
Professor John Silke, Dr James Vince, Dr Lisa Lindqvist

Dr Angus Cowan
Structural investigations into the control of Bax
Professor Peter Colman, Associate Professor Peter Czabotar

Dr Camila Franca
Naturally acquired humoral responses to *Plasmodium vivax* and *Plasmodium falciparum*: identification of antigenic targets to inform rational biomarker and vaccine development
Professor Ivo Mueller, Professor Louis Schofield, Dr Diana Hansen

Dr Ivan Fung
Investigating the role of IL-21 in the early stages of a T-dependent B cell response
Professor David Tarlinton, Professor Phil Hodgkin

Dr Lyndal Henden
Identify by descent analysis with applications to epilepsy studies and *Plasmodium* causing human malaria
Professor Melanie Bahlo, Professor Terry Speed

Dr Valerie Heong
Targeted approaches to C5 high-grade serous ovarian cancer through novel patient-derived xenografts
Professor Clare Scott, Professor Geoff Lindeman

Dr Charlie Jennison
Population and molecular level studies of malaria transmission
Associate Professor Justin Boddey, Professor Alan Cowman

Dr Alex Kennedy
Complement evasion mechanisms of the important human pathogen *Plasmodium falciparum*
Associate Professor Wai-Hong Tham, Professor Alan Cowman

Dr Logesvaran Krshnan
Mapping subunit organisations within the T cell receptor-CD3 complex
Associate Professor Matthew Call, Dr Melissa Call

Dr Sophie Lee
The role of Klk1 in haematopoiesis, malignancy and angiogenesis
Professor Andrew Roberts, Dr Ashley Ng

Dr Chunyan Ma
The role of necroptosis in acute myeloid leukaemia development and treatment
Professor John Silke, Dr Gabriela Brumatti, Professor Paul Ekert

Dr Danushka Marapana
Dissection of early events that govern protein export in malaria-infected erythrocytes
Professor Alan Cowman, Associate Professor Justin Boddey

Dr Kate McArthur
Apoptotic caspases: silencing the mitochondrial danger within
Associate Professor Guillaume Lessene, Dr Mark van Delft, Professor Ben Kile

Dr Nisha Narayan
The role of micro RNAs miR-155 and miR-211 in myeloid malignancies
Professor Paul Ekert, Dr Anissa Jabbour

Dr Paul Nguyen
How do cytokines promote gastrointestinal cancer?
Dr Tracy Putoczki, Professor Matthias Ernst

Dr Tan Nguyen
Investigating the physiological roles of the mammalian SID-1 orthologues Sidt1 and Sidt2
Dr Ken Pang, Associate Professor Seth Masters

Dr Emma Nolan
The identification of novel strategies for the prevention and treatment of breast cancer in BRCA1-mutation carriers
Professor Jane Visvader, Professor Geoff Lindeman

Dr Samar Ojaimi
Pro-apoptotic therapies for the treatment of *Mycobacterium tuberculosis* disease and latent infection
Professor Marc Pellegrini, Professor Gabrielle Belz

Dr Shereen Oon
Il-3Ra as a novel therapeutic target in systemic lupus erythematosus
Professor Ian Wicks, Dr Nicholas Wilson

Dr Ashleigh Poh
Investigation of the role of haematopoetic cell kinase in gastrointestinal cancer
Professor Robert O'Donohue, Dr Tracy Putoczki, Professor Matthias Ernst

Dr Antonia Policheni
Identifying driver mutations in p53-deficient lymphomas
Associate Professor Daniel Gray, Professor Andreas Strasser

Dr Michael Roy
Towards novel BH3-mimetics – structure-guided development of small molecule inhibitors targeting pro-survival BCL-2 family proteins
Associate Professor Guillaume Lessene, Associate Professor Peter Czabotar, Professor Peter Colman

Dr Tom Sidwell
The transcription factor Bach2 in the activation and differentiation of CD4 T cells
Professor Axel Kallies, Professor Gabrielle Belz

Dr Cyrus Tan
Intra-membrane substrate recognition by membrane-associated E3 ligases
Associate Professor Matthew Call, Dr Melissa Call

Dr Maria Tanzer
Investigation of cell death pathways in response to TNF and IFNγ
Professor John Silke, Professor David Vaux, Dr Andrew Webb, Dr Jarrod Sandow

Dr Emma Watson
The role of BCL-2 family proteins in apoptosis regulation during angiogenesis
Dr Leigh Coultas, Associate Professor Grant Dewson, Professor David Vaux

Dr Clare Weeden
Understanding the formation and treatment of lung squamous cell carcinoma
Dr Marie-Liesse Asselin-Labat, Professor Geoff Lindeman

Dr Annie Yang
Molecular mechanisms of cell traversal by *Plasmodium falciparum*
Associate Professor Justin Boddey, Professor Alan Cowman

Master of Research, The University of Melbourne

Ms Yuan Yao
Overcoming therapeutic barriers in multiple myeloma by targeting the pathway to apoptosis
Professor Andrew Roberts, Professor David Huang

Ms Kun Yang
Targeting effector and memory T cell differentiation
Professor Axel Kallies

Mr Yisheng Zhang
Defining and developing novel host targeted therapies to eliminate chronic human infections
Professor Marc Pellegrini

Bachelor of Science (Honours) or Bachelor of Biomedicine (Honours), The University of Melbourne

Mr Abdullah Alazawi
Intracellular delivery of an anti-Bak antibody to trigger apoptosis
Dr Ruth Kluck, Dr Sweta Iyer

Ms Katherine Balka
Investigating mechanisms of innate immune activation
Dr Dominic De Nardo, Associate Professor Seth Masters

Mr Richard Bestel de Lezongard
Optimisation of the P2 region of peptidomimetic inhibitors of plasmepsin V
Professor Alan Cowman, Dr Brad Sleebs, Associate Professor Justin Boddey

Mr Ignatius Bourke
Structural studies of invasion processes during malaria infection
Dr Wilson Wong, Dr Tony Hodder, Professor Alan Cowman

Mr Dale Calleja
Revisiting the SOCS SH2 domain as a therapeutic target
Associate Professor Sandra Nicholson, Dr Edmond Linossi

Ms Sheryl Ding
Interrogating the consequences of Keap1 loss in KrasG12D-induced lung adenocarcinoma
Dr Kate Sutherland, Dr Sarah Best

Ms Meg Elliott
Pathogenic phenotypes of somatic caspase 3 deletions in human colorectal cancer
Associate Professor Oliver Sieber, Dr Anuratha Sakthianandeswaren

Ms Cindy Evelyn
Quantitative analysis of calcium flux and membrane lipid order of red blood cells during malaria parasite invasion
Dr Kelly Rogers, Professor Alan Cowman, Dr Lachlan Whitehead

Mr Aaron Harrison
Characterising differential signalling through CXCR3 in CD8 T cells
Dr Joanna Groom, Dr Fanny Lafouresse, Professor Stephen Nutt

Ms Therese Hoang
Investigating the role of HBO1 in regulating the chromatin landscape during cellular reprogramming and differentiation
Dr Natasha Zamudio, Associate Professor Tim Thomas

Ms Hannah Hughes-Parry
The generation and characterisation of GRP78 CAR T cells for glioma
Dr Misty Jenkins, Dr Ryan Cross

Ms Hamdi Jama
Immune mechanisms of vascular disease
Professor Ian Wicks, Dr Angus Stock, Associate Professor Sandra Nicholson

Ms Narelle Keating
Investigating the importance of ARAP2 for CIS-regulation of IL-15 signalling in natural killer cells
Associate Professor Sandra Nicholson, Dr Fernando Souza-Fonseca-Guimaraes, Dr Edmond Linossi

Ms Elizabeth Kyran
Characterising a rare, drug-resistant ovarian carcinosarcoma derived from a genetically engineered mouse model
Professor Clare Scott, Dr Holly Barker, Dr Matthew Wakefield

Ms Joy Liu
Investigating the morphology and function of chemosensory neurons in the parasitic roundworm *Ascaris suum*
Associate Professor Aaron Jex, Dr Kelly Rogers

Ms Kylie Luong
Hunting down serial killers: investigating the role of phosphatidylserine exposure on CD8+T lymphocytes as an indicator of serial killing
Dr Misty Jenkins, Dr Susanne Heinzel

Ms Emi McRae
The role of cAMP signalling in *Toxoplasma* infection
Associate Professor Chris Tonkin, Dr Kelly Rogers

Mr Jordan Michael
Single cell RNA-seq for biomarker discovery and immune status assessment
Dr Shalin Naik, Dr Tom Weber

Ms Halina Pietrzak
Understanding the role of IgM+ memory B cells in immunity to malaria using a mouse model of infection
Dr Diana Hansen, Dr Lisa Ioannidis

Ms Sonia Poetrodjojo
Synthesis of 2-C-mannosyl indoles
Dr Ethan Goddard-Borger

Mr Mark Rowland
Structural analysis of *Toxoplasma* motility
Associate Professor Chris Tonkin, Dr Melissa Call

Mr Kaiseal Sarson-Lawrence
The mechanisms of malaria parasite invasion into reticulocytes
Associate Professor Wai-Hong Tham, Professor Alan Cowman

Ms Kristen Scicluna
Elucidating the structure and function of BCL-RAMBO
Associate Professor Grant Dewson, Associate Professor Peter Czabotar

Mr Ray Shen
Circadian regulation of innate lymphoid cells
Professor Gabrielle Belz, Dr Cyril Seillet

Mr Daniel Simpson
A novel role for mind bomb-2 (MIB2) in cell death and inflammation
Dr Rebecca Feltham, Dr James Vince

Ms Gemma van Duijneveldt
Characterising the role of interleukin 11 in initiation and progression of pancreatic cancer
Dr Tracy Putoczki, Dr Ka Yee Fung

Mr Victor Volynski
Understanding how malaria parasites sabotage acquisition of immunity
Dr Diana Hansen, Dr Lisa Ioannidis

Mr Michael Zhan
Deciphering the threshold for apoptosis induction
Professor David Huang, Professor Phil Hodgkin, Dr Zhen Xu

Ms Michelle Zheng
How the voltage dependent anion channel 2 interacts with Bak and Bax
Associate Professor Peter Czabotar, Dr Boris Reljic, Associate Professor Grant Dewson

Patents granted in 2017

Alpha-helical mimetics

Inventors: J Baell, G Lessene

France, Germany, Ireland, Switzerland, Netherlands, UK, Sweden, Belgium

Apoptosis-inducing agents for the treatment of cancer and immune and autoimmune diseases

Inventors: M Bruncko, Y Dai, H Ding, G Doherty, S Elmore, L Hasvold, L Hexamer, A Kunzer, R Mantei, W McClellan, C Park, A Petros, X Song, A Souers, G Sullivan, Z Tao, G Wang, L Wang, X Wang, M Wendt, P Czabotar, G Lessene, P Colman

Chile, China, Colombia, Cyprus, Denmark, Singapore, South Korea (x2), Taiwan (x2), US, Japan (x2), Australia, Indonesia, India, Spain, Russia, Germany, Ireland, Switzerland, UK, Belgium, France, Hungary

Apoptosis-inducing agents for the treatment of cancer and immune and autoimmune diseases

Inventors: M Bruncko, H Ding, G Doherty, S Elmore, T Hansen, L Hasvold, L Hexamer, A Kunzer, R Mantei, S Xiaohong, A Souers, G Sullivan, Z Tao, L Wang, X Wang, G Wang, M Wendt

Italy (x2), Luxembourg (x2), Latvia, Slovenia (x2), Australia (x2), China (x2), Japan (x2), South Korea (x2), Russia (x3), Singapore (x2), Taiwan (x2), Colombia, Israel, Mexico, New Zealand, Peru, Ukraine, South Africa, Vietnam, Panama, Hong Kong, Malta, France, Austria, Sweden, Turkey, Spain, Portugal, Slovakia, Croatia, Romania, Belgium, Albania, Greece, Latvia, Norway, Finland, Denmark, UK, Cyprus, Ireland, Czech Republic, Iceland, Netherlands, Estonia, Hungary, Monaco, France, Germany, Switzerland, Bulgaria, San Marino

Barley with low levels of hordeins

Inventors: C Howitt, G Tanner

Mexico

Compounds and methods of use

Inventors: J Baell, C Bui, P Colman, P Czabotar, D Danette, S Elmore, W Fairbrother, J Flygare, G Lessene, C Ndubaku, G Nikolaopoulos, A Petros, C Rye, B Smith, A Souers, K Watson

Canada

Dendritic cell marker and uses thereof

Inventors: I Caminschi, M Lahoud, A Lew, K Shortman, A Proietto, M Wright, L Wu

Israel, Japan, France, Germany, Ireland, Sweden, Switzerland/ Lichtenstein, Netherlands, UK, Belgium

Heterocyclic compounds and methods of use

Inventors: J Baell, C Bui, P Colman, P Czabotar, D Danette, S Elmore, W Fairbrother, J Flygare, G Lessene, C Ndubaku, G Nikolaopoulos, A Petros, C Rye, B Smith, A Souers, K Watson

South Korea

Methods and compositions for treating and preventing malaria (2)

Inventors: J Beeson, A Cowman, S Lopaticki, A Maier, K Persson, J Richards

Canada

Methods and compositions for treating and preventing malaria using an invasion ligand directed to a protease-resistant receptor

Inventors: J Baum, L Chen, A Cowman

South Korea

Method of treating cancer

Inventors: N Lalaoui, J Silke, D Vaux

US

Novel anti-cancer agents

Inventors: T Burgess, G Lessene, K Watson, H Witchard, F Walker

Italy, Spain, Czech Republic, Belgium, France, Germany, UK, Hungary, Ireland, Slovakia, Sweden, Switzerland, Poland, Japan, Singapore

Protein kinase inhibitors and methods of treatment

Inventors: J Baell, T Burgess, G Lessene, M Hiroshi

France, Germany, Ireland, Switzerland, Netherlands, UK, Sweden, Belgium

Soluble mediator

Inventors: L Harrison, E Bandala Sanchez, J Dromey, M Rashidi (only in Australia), Y Zhang

Australia, US

Soluble mediator

Inventors: L Harrison, M Rashidi, Y Zhang

Singapore, US

Tetrahydroisoquinoline derivatives and their uses to treat cancers and autoimmune disorders

Inventors: J Baell, C Bui, P Colman, P Czabotar, D Danette, S Elmore, W Fairbrother, J Flygare, L Hasvold, G Lessene, C Ndubaku, G Nikolaopoulos, A Petros, C Rye, B Smith, A Souers, Z Tao, L Wang, X Wang, K Watson

Canada

Treatment and prevention of malaria

Inventors: A Cowman, L Chen, T Triglia

Australia, US

A remarkable place

Below: Koorie artist Mr Robert Young (right) led a sunset smoking ceremony at the Institute during National Reconciliation Week.

Operational overview

The Institute has seen considerable progress in many areas of strategy and operations in 2017, which have underpinned our scientific achievements and helped to consolidate our outstanding workplace culture.

Technology enabling discoveries

Modern medical research relies on access to a range of technologies. Several years ago we identified that our research would be enhanced by investment in the rapidly advancing field of biological imaging. Guided by our Imaging Strategy, the Institute's new Centre for Dynamic Imaging houses world-leading microscope technology, operated by imaging experts (see page 44). Excitingly, we are already seeing research achievements never before possible.

A by-product of modern research technologies – including imaging – is the need to store and analyse massive datasets in volumes that would have been unimaginable a decade ago. Ongoing investment and expansion of our research computing infrastructure is ensuring our researchers can continue to make world-leading discoveries.

Building financial sustainability

A highlight of 2017 was the successful negotiation of the partial sale of rights in anti-cancer medicine venetoclax. The outcome of this Australian-first deal has yielded many benefits for current and future research at the Institute (see page 7), supporting financial sustainability while preserving some future rights associated with this new drug.

The expertise of our professional services teams was also crucial for the development of a new investment strategy for the Institute's endowment, which was boosted through additional income from our venetoclax deal. This work has ensured that the Institute's endowment provides an optimal balance between income and long-term financial security.

Reinforcing a great culture

The Institute's first Diversity and Inclusion Strategy was launched in 2017, providing a framework to ensure support for all our staff and students (see page 46). As part of our commitment to providing an outstanding workplace and building a positive culture, Institute staff and students were encouraged to participate in a range of activities to raise awareness of diversity, gender equity and mental health. In 2017, in the context of the national discourse about changing Australia's marriage laws, the Institute was proud to state its support for marriage equality.

Work has also continued on an audit of the Institute's gender equity policies and practices, as part of our 2018 application for a SAGE Athena SWAN Bronze Institutional Award (see page 47). We also saw great progress in the construction of our new Early Childhood Education and Care centre (see page 50). The centre, with its prominent position on the Institute's forecourt, will open in 2018, further enriching our culture and the opportunities it affords Institute parents. This has also provided a unique opportunity for the Institute to strengthen its connections with local Aboriginal culture, with a Victorian Aboriginal family being commissioned to contribute to the interior design of the centre.

Responsible research stewardship

The Institute's professional services teams collaborate closely with our researchers, enhancing the Institute's science by providing high-quality stewardship and service delivery across a range of areas. Several new systems were implemented in 2017, including the bespoke Animal Management System, a database that enhances data collection and collaboration between laboratories and our bioservices facilities. Work has also continued in the area of responsible governance, with a focus on significant policies and strategies that ensure the Institute continues to be both a scientific leader as well as a great place to work. Important updates were made to policies related to parental leave and appropriate workplace behaviour.

Ms Samantha Ludolf
Deputy Director, Strategy and Operations

Accelerating drug development

The new Drug Discovery Centre, opening in 2018, will allow our scientists to accelerate the development of new medicines to treat disease and improve health outcomes.

Turning discoveries into treatments

Institute scientists have made many discoveries showing how diseases develop at the molecular level. This research often reveals molecular 'targets' – molecules that are pivotal to disease development or progression.

New medicines that precisely bind to or interact with these 'targets' are changing how we can treat or cure disease, including cancers, immune disorders and inflammatory conditions.

For more than a decade the Institute has been committed to drug discovery, investing in critical technologies and disciplines including medicinal chemistry, structural biology and high-throughput screening.

The new Drug Discovery Centre will bring together and enhance our expertise in these areas, supporting researchers to more rapidly translate basic biology to early-stage drug discovery, and accelerating the design and validation of potential new medicines.

Aiding in the establishment of the Drug Discovery Centre was a $1 million Centenary gift from former Institute board member Mr Mike Fitzpatrick and his wife Ms Helen Sykes.

Mr Fitzpatrick said the Institute had made many exciting discoveries in medical biology. "Helen and I are thrilled to be supporting the translation of scientific discoveries at the Walter and Eliza Hall Institute into better health outcomes for the community," he said.

Potential for expansion

In Australia, there is a shortage of early-stage drug discovery infrastructure at a national level, limiting the ability of Australian researchers to develop new medicines from their discoveries.

In recognition of this gap, the Victorian Government Department of Health and Human Services in 2017 committed $1 million to develop a business case for the establishment of a National Drug Discovery Centre at the Institute.

Institute director Professor Doug Hilton said the centre would potentially allow more Australian research discoveries to be translated into new medicines.

"This would offer many benefits for Victoria and Australia, strengthening our reputation for medical research, generating jobs and enhancing commercial returns," he said.

Breakthrough recipe for reproducing 'natural' medicines

Naturally occurring substances are a valuable source of potential new medicines. However a major barrier is harvesting the chemicals in large enough quantities to investigate or develop as medicines.

A 10-year project led by Institute scientists has discovered how to synthesise an antimicrobial molecule found in marine sponges. Called spiroleucettadine, the molecule has been speculated to have potential in treating infections and cancer.

Associate Professor Guillaume Lessene collaborated with colleagues at the University of Otago, New Zealand, to develop the world's first step-by-step 'recipe' for making spiroleucettadine.

"Spiroleucettadine is found in vanishingly small quantities in sponges, so it is not practical to harvest it directly to properly investigate its medicinal potential," Associate Professor Lessene said. "However, its unprecedented chemical structure has posed a barrier to making an artificial version in the lab.

"We are excited that it will now be possible to properly examine whether this molecule is a suitable candidate for the development of new medicines," he said. "This project is a fantastic demonstration of the depth of expertise in chemistry at the Institute."

Right: Associate Professor Guillaume Lessene leads a medicinal chemistry team with expertise in the design, synthesis and modification of new drugs.

Advancing research through imaging

Growing the Institute's imaging capabilities will keep our researchers at the forefront of discovery in health and disease.

In 2017 the Institute's world-class imaging facility – the Centre for Dynamic Imaging – received a funding boost of almost $3 million from the Alan G L Shaw estate, allowing expansion of the facility.

Building a world-class facility

Since 2016 the Institute has made significant investment in its Centre for Dynamic Imaging. This advanced imaging facility enables scientists at the Institute and around Australia to access state-of-the-art microscopy and expert advice to advance their discoveries.

The centre is run by Dr Kelly Rogers, an expert in advanced microscopy, who leads a multidisciplinary team with expertise in biology, physics, engineering and mathematics.

Science and art collide

The wonders of biology are highlighted by the beautiful images and movies captured at the Centre for Dynamic Imaging.

In 2017 the best of these images and movies were showcased in the Institute's Art of Science exhibition, at Melbourne's Federation Square.

One of the movies in the competition, titled *Eye of the beholder*, was captured by Dr Stephen Mieruszynski and Dr Leigh Coultas. This still image from the movie shows the network of blood vessels that nourish the eye during development. Once the eye has developed, these vessels will undergo a controlled cell death and scavenger cells – the green dots – will eat the leftovers. The intricate structure of vessels was visualised in three dimensions for the first time thanks to advances in imaging technology. Understanding this process helps to inform new treatments for eye diseases.

New views of biology

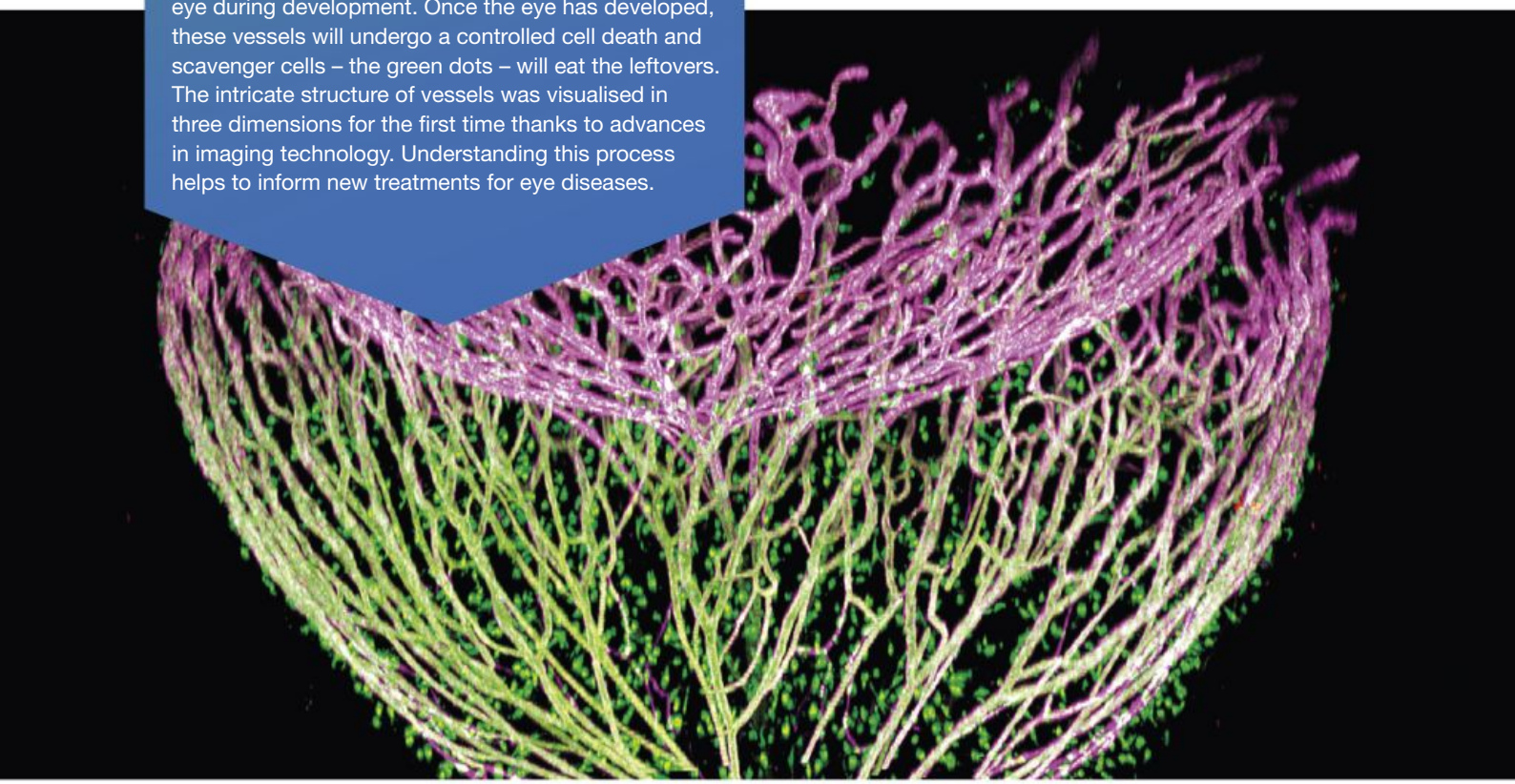
Visualising biological mechanisms and behaviours can give researchers insights into how diseases develop, spread and respond to treatment.

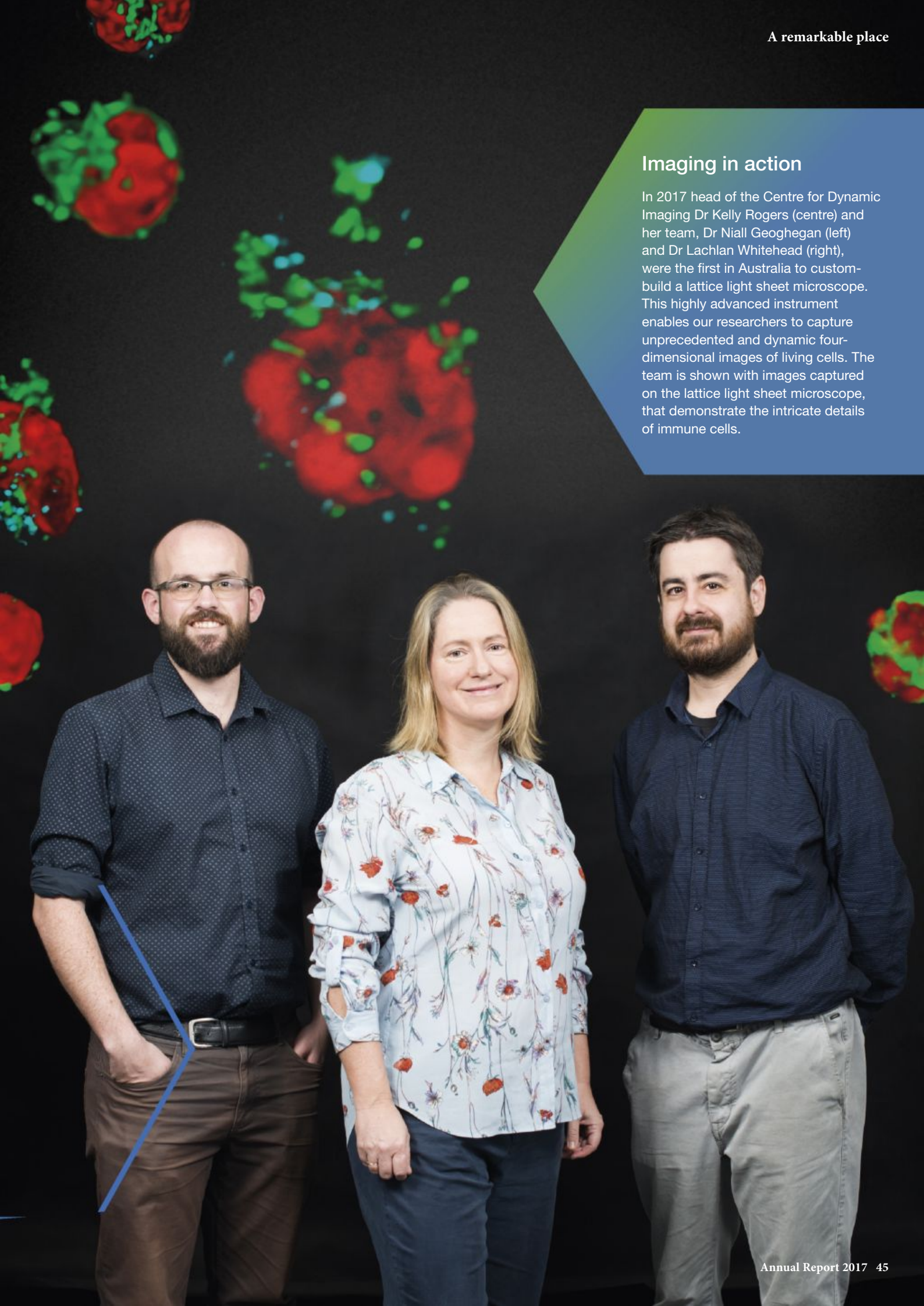
Dr Rogers said technological advances in microscopy have given researchers the power to watch biology unfold in exquisite detail.

"Increasingly we have the ability to look at biology in four dimensions (4D) – that's getting up close and personal with biology in its natural environment, at all scales and in real time. It's an exciting time to be working at the field's cutting edge," she said.

Microscopes such as the new 4D lattice light sheet microscope enable researchers to capture spectacular images from sub-cellular levels right through to whole organs.

"Light sheet based technology will cause a significant shift in how we can visualise and investigate cancers, infectious diseases and inflammation in the body, and answer questions that have – until now – been beyond our grasp," Dr Rogers said.





Imaging in action

In 2017 head of the Centre for Dynamic Imaging Dr Kelly Rogers (centre) and her team, Dr Niall Geoghegan (left) and Dr Lachlan Whitehead (right), were the first in Australia to custom-build a lattice light sheet microscope. This highly advanced instrument enables our researchers to capture unprecedented and dynamic four-dimensional images of living cells. The team is shown with images captured on the lattice light sheet microscope, that demonstrate the intricate details of immune cells.

Embedding diversity and inclusion at the Institute

The Institute is focused on solving complex health problems that impact a broad cross-section of our community.

To achieve our vision, we must ensure diversity and inclusion are part of everything we do as part of our commitment to a free, fair and equitable society.

Valuing diversity and inclusion

We recognise our workforce has diverse and often intersecting identities based on their gender, sexual orientation, ethnicity or cultural background, religion, family or disability.

In 2017 we launched our first Diversity and Inclusion Strategy, which provides a framework to support, guide and coordinate our activities in this area. We also celebrated our first Diversity and Inclusion Week, which showcased our diversity and inclusion implementation plan.

The Institute's Diversity and Inclusion Strategy identifies five principles that are foci for our attention and activities:

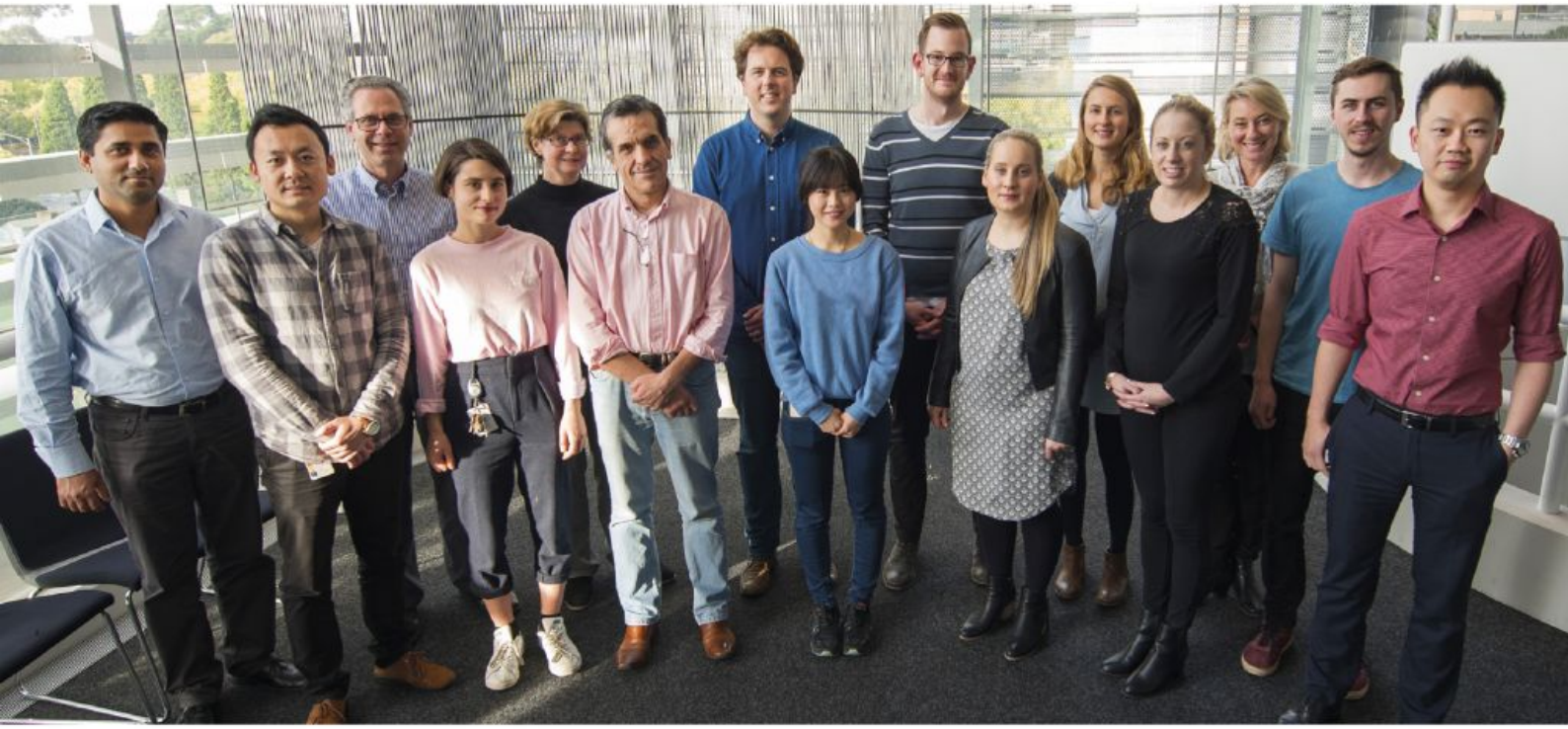
- articulating the 'why' of diversity and inclusion for the Institute;
- establishing measurement, accountability and transparency of data-driven decision-making;
- developing sustainable diversity and inclusion leadership;
- focusing on inclusion to capitalise on diversity; and
- building diversity and inclusion into everyday processes.

Institute director Professor Doug Hilton said the strategy recognised that, although the Institute had taken action to redress gender inequality, a broader approach to diversity and inclusion was needed.

"By focusing on inclusion, we want to create a culture where we accentuate and celebrate our similarities as much as those things that make us different," Professor Hilton said.

"Having a diverse workforce and fostering a spirit of inclusiveness will produce more innovative and creative collective thinking at the Institute. Embedding diversity and inclusion in all Institute activities will in turn increase our ability to make significant medical discoveries and continue our tradition of excellence in medical research."

Below: In 2017 the Institute was proud to publicly state its support for marriage equality, in response to the national postal survey on the change to Australian marriage laws. Our position reflected our commitment to diversity and inclusion, and the rights of all people to live in a society that is free, fair and equitable.



Promoting gender equity

The Institute has made a long-term commitment to achieving gender equity, as one aspect of our dedication to the values of diversity and inclusion.

Progress towards accreditation

Understanding our current progress toward gender equity, how this is perceived by our staff and students, and the barriers to progress are key to implementing effective gender equity initiatives.

In 2017 a considerable body of work examined staff attitudes and experiences, plus our policies and data. This provided many important insights that are guiding our future actions towards gender equity.

The Institute is in the first cohort of Australian organisations working towards accreditation under the Australian Academy of Science's Science in Australia Gender Equity (SAGE) Athena SWAN pilot.

This program, which aims to improve the promotion and retention of women and gender minorities in science, requires a detailed process of self-assessment, data collection and analysis to examine our policies, practices and workplace culture relevant to gender equity and diversity. Extensive consultation was undertaken through focus groups, surveys and workshops.

Through this process, the Institute has developed an action plan that identifies relevant key issues, gaps and opportunities, in particular focusing on enhancing our policies around recruitment and retention of staff, enhanced career development opportunities, and encouraging the uptake of flexible work options for staff. The inaugural SAGE Athena SWAN Bronze awardee organisations will be announced in late 2018.

Championing change

The Male Champions of Change is a coalition of male leaders across Australia, including Institute director Professor Doug Hilton, committed to achieving gender equity and accelerating the advancement of women into leadership positions.

Male Champions of Change assess and identify how member organisations implement progressive, high-impact actions that support sustainable gender equality in workplaces.

In 2017 the coalition focused on eliminating everyday sexism, and understanding and closing the gender pay gap. These initiatives have allowed the Institute to reflect on its own journey towards gender equity, and to learn from other organisations.

Partnership for local progress

The Institute is a member of the Women in Science Parkville Precinct (WiSPP) initiative, joining with four other medical research organisations to boost the representation of women in science leadership.

In 2017 WiSPP completed a key data-collection activity through a multi-purpose gender equity survey run by all member organisations to create a robust evidence base to drive future work.

Above: By ensuring diversity and inclusion are part of everything we do, we enable all our people to achieve their full potential.

Working together for reconciliation

We aim to make meaningful contributions to improving health outcomes for Aboriginal and Torres Strait Islander peoples, through an Institute-wide commitment to reconciliation.

Our *Innovate Reconciliation Action Plan* (RAP) has guided the Institute's reconciliation journey in 2017. Important aspects of our *Innovate RAP* are:

- solidifying relationships between the Institute and Aboriginal and Torres Strait Islander stakeholders;
- building respect for Aboriginal and Torres Strait Islander peoples;
- providing opportunities for Aboriginal and Torres Strait Islander peoples through study and employment; and
- targeted support of local businesses and organisations working to improve outcomes for Aboriginal and Torres Strait Islander peoples.

Building relationships and respect

Deepening our cultural knowledge and respect, strengthening relationships and involving Aboriginal and Torres Strait Islander peoples in the Institute are key parts of our reconciliation journey. In 2017 Institute staff and students were offered a range of opportunities to learn about and celebrate Aboriginal and Torres Strait Islander history, culture and achievements.

Deepening our cultural knowledge and respect, strengthening relationships and involving Aboriginal and Torres Strait Islander peoples in the Institute are key parts of our reconciliation journey.

These activities included hosting a National Reconciliation Week art exhibition and cultural learning programs provided by the Young family, a Koorie family who have made significant contributions to our reconciliation process. We were honoured that the Young family strongly contributed to the internal design concept for our new Early Childhood Education and Care centre, providing a holistic and meaningful integration of Aboriginal culture and history into this new part of the Institute.

In NAIDOC Week the Institute proudly unveiled a permanent Welcome to Country that stands at the beginning of the historic timeline installation in our Parkville campus. It acknowledges and honours the Wurundjeri people's culture and history, which significantly predate the Institute, and their connection to the land on which the Institute stands.

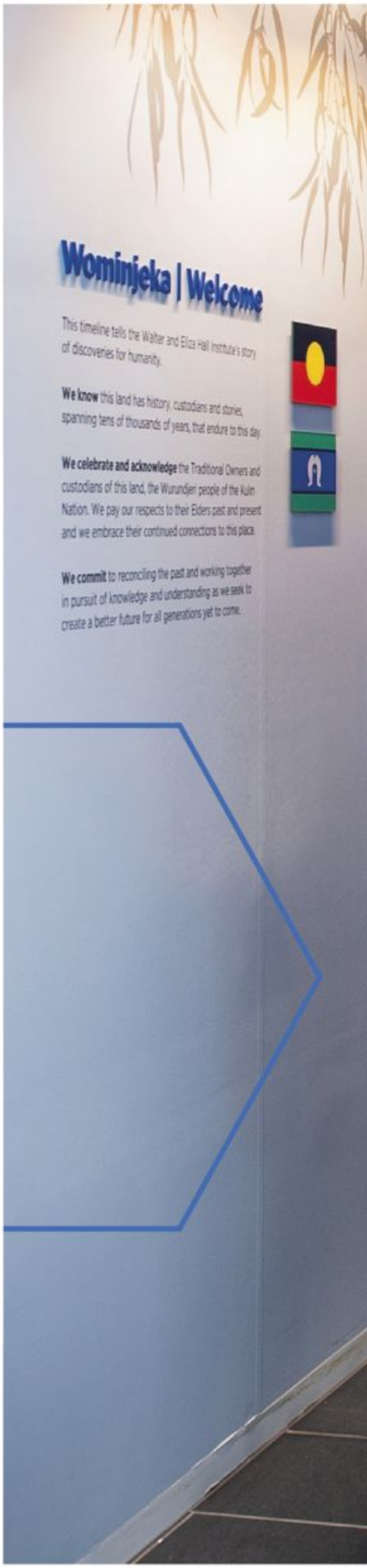
To reflect the NAIDOC Week theme 'Our Languages Matter', everyday items around the Institute were translated into Woi Wurrung, the language of the local Wurundjeri people.

Dr Jason Brouwer, co-chair of the Institute's Reconciliation Committee said language provided important connections with culture. "By understanding the diversity of languages in this country, we can gain new insights into the importance they hold for embracing and preserving Aboriginal and Torres Strait Islander culture," Dr Brouwer said.

Creating opportunities

The Institute is committed to providing early career opportunities to Aboriginal and Torres Strait Islander peoples with an interest in science. In 2017 we offered training to five Aboriginal and Torres Strait Islander interns through our partnership with the CareerTrackers Indigenous Internship Program. We also built awareness of medical research career paths through our involvement with the University of Melbourne and GTAC Residential Indigenous Science Experience.

Our membership of Supply Nation, an Indigenous supplier diversity organisation, has also enabled the Institute to create social impact by supporting Aboriginal and Torres Strait Islander businesses.



Acknowledging Wurundjeri culture

The Institute's Reconciliation Committee was co-chaired in 2017 by Internal Communications Manager Ms Merrin Fabre (left) and postdoctoral researcher Dr Jason Brouwer (centre left). Together with external committee members Dr Ngaree Blow (centre right) and Dr Lyndon Ormond-Parker (right) they championed the installation of a prominent and permanent Welcome to Country in the Institute's Parkville campus.

On-site childcare to provide vital support for parents

The Institute is committed to attracting, developing and retaining the best and brightest workforce in order to deliver positive health outcomes to our community. Access to adequate childcare is one of the most significant barriers to ongoing career advancement for our workforce.

Considerable progress was made in 2017 towards the completion of the Institute's new Early Childhood Education and Care centre, a first for an Australian independent medical research institute. The five-storey, 100-place centre, located on the Institute's Parkville campus forecourt, will offer support to staff in the precinct with family responsibilities.

Rapid progress

In early 2017 Institute staff and families, along with Victorian Minister for Families and Children the Hon. Jenny Mikakos MP, donors and other supporters, celebrated the ceremonial 'turning of the sod' before the Early Childhood Education and Care centre's construction. By the end of 2017 the building's outer structure had been completed and internal fit-out and playground works had commenced. The centre is scheduled to open in mid-2018.

In line with our commitment to reconciliation, the Young family, a Koorie family who have worked closely with the Institute on many aspects of our reconciliation journey, have been working with the Institute to integrate recognition of Indigenous history and culture into the centre and its curriculum.

In late 2017 the Institute announced FROEBEL had been appointed to operate the Early Childhood Education and Care centre. FROEBEL is a not-for-profit provider of high-quality early education and care services, with a strong focus on bilingual education and inquiry based, early STEM learning.

Support from our community

The Parkville precinct is Australia's largest health and medical research hub and there is high demand for childcare from its research and healthcare professionals. The centre will bring vital services and opportunities to precinct parents dedicating their working lives to the health and wellbeing of our communities. The Institute has received support from the Victorian Government as well as more than $2 million in donations from the philanthropic community.

Below: Institute families celebrated the ceremonial 'turning of the sod' for our new Early Childhood Education and Care centre.

Organisation and governance

Below: Hundreds of people were able to tour the Institute as part of Open House Melbourne.

Walter and Eliza Hall Institute Board

The directors of the Walter and Eliza Hall Institute of Medical Research Board
31 December 2017

Mr Christopher W Thomas AM

BCom (Hons) MBA *Melbourne* FAICD

Appointed: February 2001
Appointed president: February 2013

Mr Thomas joined executive search firm Egon Zehnder International in 1979 and was managing partner of the Melbourne office (1986-2003). He was also leader of the firm's global Board Consulting Practice Group (1998-2006) and chaired the firm's twice-yearly international partners' meetings (1997-2007).

Mr Thomas is a fellow of the Australian Institute of Company Directors, and is currently a member of the National Gallery of Victoria's Remuneration and Nomination Committee. He has served on the board of the Corps of Commissionaires (Victoria) and the Council of the Australian Film, Television and Radio School. He was chairman of the Heide Museum of Modern Art, chairman of the Victorian Community Foundation and president of the Melbourne Business School Alumni.

Mrs Jane Hemstritch

BSc (Hons) *London University* FICAEW FICAA FAICD

Appointed: October 2013
Appointed vice president: July 2016

Mrs Hemstritch was managing director Asia Pacific for Accenture Limited from 2004 until her retirement in February 2007. In this role, Mrs Hemstritch was a member of Accenture's global executive leadership team and oversaw the management of Accenture's business portfolio in Asia Pacific.

She holds a Bachelor of Science with Honours in biochemistry and physiology and has professional expertise in technology, communications, change management and accounting.

Mrs Hemstritch is a member of the Council of The National Library of Australia, the Global Council of Herbert Smith Freehills, the Council of Governing Members of The Smith Family and Chief Executive Women. She is an independent non-executive director of Telstra Corporation Ltd, Lend Lease Corporation Limited, and Victorian Opera Company Ltd (chairman from February 2013).

Mr Robert Wylie

FCA FAICD

Appointed: April 2014
Appointed honorary treasurer: April 2014

Mr Wylie is a fellow of the Australian Institute of Company Directors, a fellow and past president of the Institute of Chartered Accountants in Australia and a member of the Institute of Chartered Accountants in Scotland. He is a non-executive director of Maxitrans Industries Limited.

Mr Wylie joined Deloitte in 1973 in the United Kingdom, transferring to Australia in 1976. He was national chairman of Deloitte Australia from 1993 to 2001. He was deputy managing Partner Asia Pacific from 2001 before joining Deloitte & Touche USA as a senior executive partner in 2002 until 2006. He was also a member of The Deloitte Global Board and Global Governance Committee as well as The Deloitte Consulting Global Board.

Mr Malcolm Broomhead

BE (Civil), MBA *UQ*, FIE (Aus), FAusIMM, FAIM, MICE (UK), FAICD

Appointed: July 2014

Mr Broomhead is a professional non-executive director. His directorships include BHP Billiton Limited and Orica Limited (chairman).

Mr Broomhead was formerly managing director and CEO of Orica Limited from 2001 until September 2005. Prior to Orica, he was managing director and CEO of the global diversified resources company North Limited.

He has had extensive experience in the resources industry, as well as in finance, investment and construction activities. He has worked in management positions with Halcrow (UK), MIM Holdings, Peko Wallsend and Industrial Equity.

Mr John Dyson

BSc *Monash* Grad Dip Fin Inv SIA MBA *RMIT*

Appointed: May 2016

Mr Dyson has been an active participant in the venture capital industry for two decades. He is one of the founders of Starfish Ventures, a venture capital company established in Melbourne in 2001; and is chair of Swinburne Ventures Pty Ltd, the entity responsible for the commercialisation of technology for Swinburne University of Technology.

From 1997 to 2002 he was a director of the Australian Venture Capital Association Limited, including deputy chairman in 1998 and chairman in 1999. He is currently a director of technology companies Atmail, Audinate and Myriax. Before moving into venture capital Mr Dyson worked in the investment banking and stockbroking industries for Schroders, Nomura Securities, KPMG and ANZ McCaughan.

Mr Dyson is a passionate alpine skier and is a former chairman of the Mount Buller and Mount Stirling Alpine Resort Management Board, which oversees the management of Victoria's largest alpine resort. He is also a co-trustee of the Dyson Bequest, a $15 million charitable foundation that provides grants to a range of social welfare, education and environmental causes.

Professor Shitij Kapur

MBBS *AIIMS* PhD *Toronto* FRCPC FMedSci

Appointed: May 2017

Professor Shitij Kapur is the dean, Faculty of Medicine, Dentistry and Health Sciences and assistant vice-chancellor (Health), University of Melbourne.

Professor Kapur is a clinician-scientist with expertise in psychiatry, neuroscience and brain imaging. He trained as a psychiatrist at the University of Pittsburgh, and undertook a PhD and fellowship at the University of Toronto. He is a diplomate of the American Board of Psychiatry and Neurology, is board certified in Canada and has a specialist medical licence in the United Kingdom.

He is a Distinguished Fellow of the American Psychiatric Association, fellow of the Academy of Medical Sciences, UK, and Fellow of King's College London, UK. He also led NEWMEDS, a European Union-wide innovative medicines initiative and STRATA, a UK-wide program to enhance stratified medicine strategies in psychiatry.

Professor Christine Kilpatrick

MBBS MBA MD DMedSci (Hon) FRACP FRACMA FAICD FAHMS

Appointed: May 2017

Professor Kilpatrick commenced as chief executive of Melbourne Health in May 2017. She was previously chief executive,The Royal Children's Hospital (2008-17) and executive director Royal Melbourne Hospital, Melbourne Health (2005-08). Professor Kilpatrick trained as a neurologist, specialising in epilepsy.

Professor Kilpatrick has held several external appointments including chair of Victorian Quality Council in Healthcare and member of the Women's and Children's Health Board. She was a former board member of Murdoch Children's Research Institute and the Royal Children's Hospital Foundation. She was awarded a Centenary Medal in 2003, included in the 2014 Victorian Honour Roll of Women and received the Distinguished Fellow Award of the RACMA in 2017.

Professor Jim McCluskey

BMedSc MB BS MD *UWA* FRACP FRCPA FAA FAHMS

Appointed: April 2011

Professor James McCluskey is deputy vice-chancellor (research) at the University of Melbourne and a Redmond Barry Distinguished Professor in Microbiology and Immunology.

He has published widely on the genetic control of specific immunity, and his research has been recognised by a number of awards including as joint winner of an Australian Museum Eureka Prize for Scientific Research, the GSK Research Excellence Award and the Victoria Prize for Life Sciences.

Professor McCluskey is director of Australian Friends of Asha Slums, the Victorian Comprehensive Cancer Centre and UoM Commercial, the Chair of Nossal Institute Ltd and a past member of the board of directors of the Bionics Institute, the Florey Institute of Neuroscience and Mental Health, the Burnet Institute and St Vincent's Institute. He established the South Australian node of the Australian Bone Marrow Donor Registry and has consulted for the Australian Red Cross in the area of transplantation matching for more than 25 years. Professor McCluskey led the development of the Peter Doherty Institute for Infection and Immunity, and also led the multi-institutional team that developed the Atlantic Fellows Social Equity Program supported by The Atlantic Philanthropies.

Ms Marie McDonald

BSc (Hons) LLB (Hons) *Melbourne*

Appointed: October 2016

Ms McDonald was a partner of Blake Dawson (now global law firm Ashurst) from 1990 to 2014. She specialised in corporate and commercial law and, in particular, cross-border mergers and acquisitions and corporate governance.

She was a member of the Australian Takeovers Panel (2001-10) and chair of the Corporations Committee of the Business Law Section of the Law Council of Australia (2012, 2013) and a deputy chair (2010, 2011).

Prior to becoming a lawyer, Ms McDonald completed a Bachelor of Science (Honours) degree with first class honours, majoring in chemistry.

Ms McDonald is a director of CSL Limited, Nanosonics Limited and Nufarm Limited.

Dr Graham Mitchell AO

RDA BVSc *Sydney* FACVSc PhD *Melbourne* FTSE FAA

Appointed: July 2007

Dr Mitchell completed his PhD at the Walter and Eliza Hall Institute in the late 1960s that involved the discovery of T and B cells.

In 1973 after postdoctoral experience in the United States, United Kingdom and Switzerland, Dr Mitchell returned to the Institute and established the Parasitology/Malaria program. He was also a previous director of research in the R&D Division of CSL Limited.

Dr Mitchell is an advisor on science and innovation to the Victorian Government and is a principal of Foursight Associates. He is a non-executive director of Antisense Therapeutics Limited and Avipep Pty Ltd and has a detailed knowledge of the academia-industry interface and global health.

Mr Terry Moran AC

BA (Hons) *LaTrobe*

Appointed: November 2013

Mr Terry Moran is the former secretary of the Department of Prime Minister and Cabinet and former secretary of the Victorian Department of Premier and Cabinet.

Mr Moran's involvement in the public service has resulted in the establishment of institutions that have made important contributions to Australia's cultural and educational landscape, such as the Wheeler Centre, the Grattan Institute, Opera Victoria, the Melbourne Recital Centre, the Australian and New Zealand School of Government and the National Institute of Public Policy.

He is the board chair for both the Barangaroo Delivery Authority and Melbourne Theatre Company, chair of the Centre for Policy Development, and holds the position of senior advisor at the Boston Consulting Group.

Ms Carolyn Viney

LLB/BA *Monash*

Appointed: December 2016

Ms Carolyn Viney has more than 20 years' experience in construction, property development and real estate investment. Ms Viney is currently Executive General Manager Development at Vicinity Centres. Over a 13-year period she held a number of senior roles at Grocon, including CEO, deputy CEO, head of development and in-house counsel. Before this, she was a senior associate at law firm Minter Ellison.

Ms Viney is a division councillor of the Property Council of Australia's Victoria Division, an advisory board member to the Victorian Government's Office of Projects Victoria and an advisory board member of Women's Property Initiatives, a not-for-profit housing provider to women and children at risk of homelessness.

The following directors of the Walter and Eliza Hall Institute of Medical Research Board retired during 2017

Professor Rufus Black

BA LLB (Hons) *Melbourne* MPhil DPhil *Oxon*

Appointed: August 2013 Retired: December 2017

Professor Rufus Black is the vice-chancellor and president of the University of Tasmania and President of Museums Victoria. He has extensive private, public and social sectors experience at both management and governance levels with a deep academic background in ethics. In 2017 Professor Black was Master of Ormond College; deputy chancellor of Victoria University; a director of the law firm Corrs Chambers Westgarth; and, within the University of Melbourne, was an Enterprise Professor in the Department of Management and Marketing, a Principal Fellow in Philosophy, and taught in the Master of Entrepreneurship degree. He was the founding chair of the Teach for Australia Board and a Director Emeritus of the New York-based Teach for All. Professor Black was previously a partner at McKinsey & Company and has made many contributions to public policy. He holds degrees in law and politics from the University of Melbourne and graduate degrees in moral theology from the University of Oxford, where he was a Rhodes Scholar.

Professor Ingrid M Winship

MB ChB MD *Cape Town* FRACP FACD FAICD

Appointed: June 2007 Retired: October 2017

Professor Winship is the inaugural chair of adult clinical genetics at The University of Melbourne and executive director of research for Melbourne Health. A medical graduate of the University of Cape Town, she completed postgraduate training in genetics and dermatology before combining an academic position at the university with a clinical position. In 1994, Professor Winship took up an academic position at the University of Auckland where she later became Professor of Clinical Genetics, clinical director of the Northern Regional Genetic Service and associate dean for research in the Faculty of Medicine and Health Sciences (1999-2003). She is currently a member of the Australian Health Ethics Committee, the Victorian Cancer Agency Reference Group and the executive management committee of the Melbourne Genomic Health Alliance.

The Rt Hon the Lord Mayor Robert Doyle AC

BA B Ed *Monash* M Litt *UNE* Hon LLD *Monash*

Appointed: October 2017 Retired: February 2018

Members of the Institute to 31 December 2017

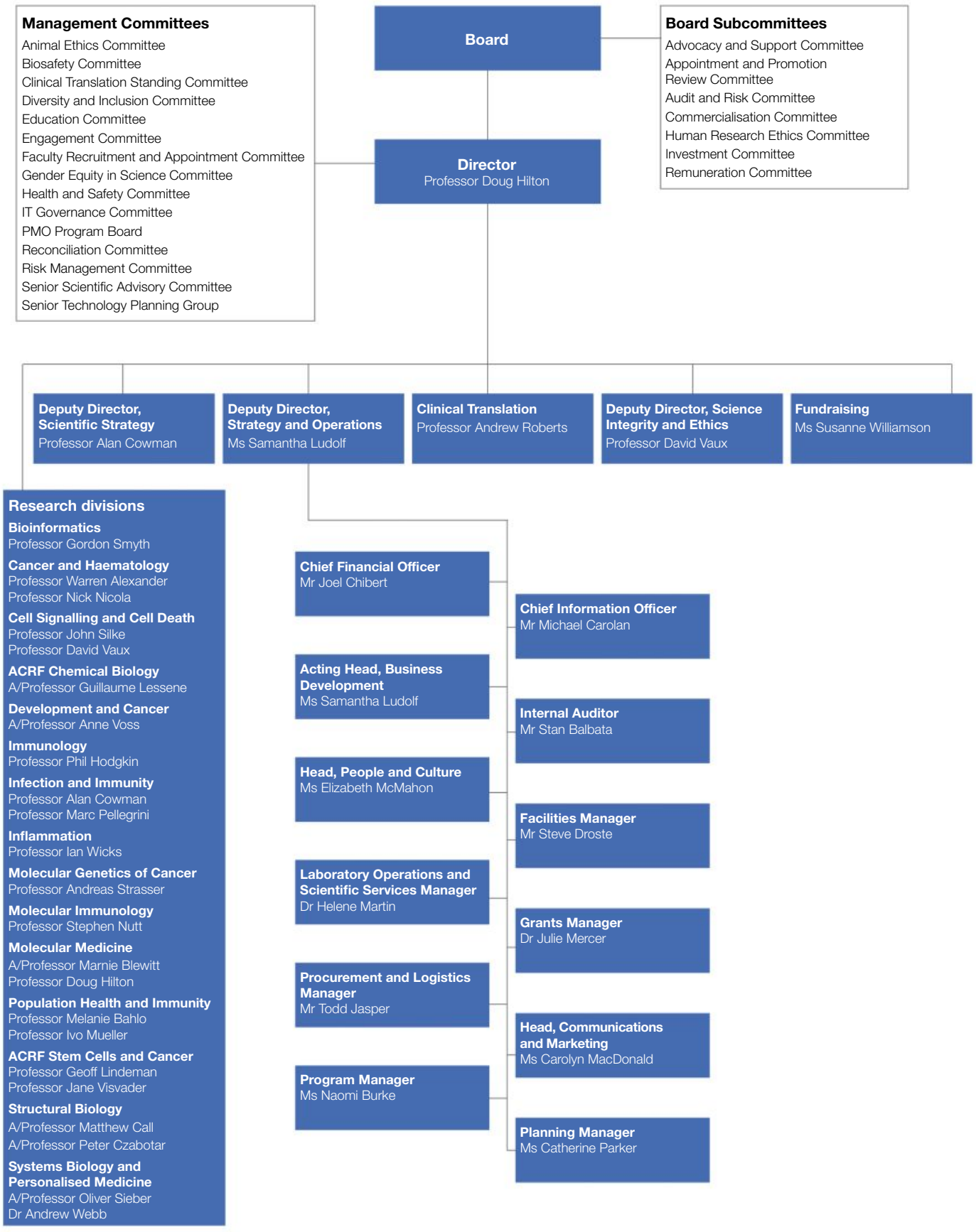
The Royal Melbourne Hospital
The University of Melbourne
Dr Susan Alberti AC
Professor Emeritus Robin Anders
Professor James Angus AO
Mr Donald Argus AC
Mr Barry Axtens
Mr Paul Barnett
Ms Helen Barry
Mrs Ann Bates
Mr Robert Bates
Mr Lance Bauer
Chairman, The Walter and Eliza Hall Trust
Dr Elsmaree Baxter
Dr Glenn Begley
Professor Claude Bernard
Mr Marc Besen AC
Dr Gytha Betheras AM
Professor Rufus Black
Mr Malcolm Broomhead
Professor Graham Brown AM
Mrs Rosalind Brown
Mrs Beverley Brownstein
Dr Gerard Brownstein
Mr Ian Brumby
Mr John Brumby AO
Dr Margaret Brumby AM
Professor Tony Burgess AC
Professor Christopher Burrell AO
Professor Robert Burton
Mr Greg Camm
Mr Terry Campbell AO
Mrs Gill Carter
Mr Pat Cashin
Mr John Chatterton AM
Lady Susannah Clarke
Mr James Clegg
Trustee, The Walter and Eliza Hall Trust
Mrs Jacqui Cooper
Associate Professor Paul Cooper
Mr Glenn Corke
Mrs Joan Curtis
Dr Andrew Cuthbertson AO
Mr John Dahlsen
Mr Stephen Daley
Mrs June Danks
Mrs Annette Davis
Mr Leon Davis AO
Dr Simon de Burgh
Professor David de Kretser AC
Professor John Denton
Mrs Elizabeth Dexter
Mr Mick Dexter
Mr Angelo Di Grazia
Mrs Helen Diamond
Ms Melda Donnelly
Professor Ashley Dunn
Mr John Dyson
Ms Roz Edmond
Mr Garry Emery
Dr Peter Eng
Mr Robert Evans
Professor Sir Marc Feldmann
Mr Michael Fitzpatrick
Mrs Pauline Flanagan
Dr Sue Forrest
Professor Richard Fox
Mrs Nolene Fraser
Mr Paul Fraser
Mrs Pam Galli
Ms Kelli Garrison
Dr Andrew Gearing
Professor David Gearing
Mrs Julie Gearing
Mrs Janet Gilbertson
Mr Peter Gilbertson
Ms Rose Gilder
Professor James Goding
Mr Charles Goode AC
Dr Gareth Goodier
Associate Professor Nicholas Gough
Mrs Andrea Gowers
Mr John Grace
Mrs Maureen Grant
Mr Tony Gray
Sir Andrew Grimwade CBE
Mrs Jean Hadges
Col Tom Hall CVO, OBE
Professor Emanuela Handman
Mr Michael Harris
Mr Harry Hearn AM
Mrs Jane Hemstritch
Professor David Hill AO
Dr Margo Honeyman
Dr Thomas Hurley AO OBE
Mr Darvell Hutchinson AM
Mr Jon Isaacs
Trustee, The Walter and Eliza Hall Trust
Mr Murray Jeffs
Mr Jose Jimenez
Mrs Terese Johns
Professor Shitij Kapur
Ms Helen Kennan
Mr Rowan Kennedy
Professor Christine Kilpatrick
Professor Emeritus Frank Larkins AM
Professor Richard Larkins AO
Mrs Belinda Lawson
Mr Gary Liddell
Professor Emeritus Ian Mackay AM
Mrs Rowena MacKean OAM
Ms Eve Mahlab AO
Mrs Robyn Male
Mr Roger Male
Mrs Lorrie Mandel
Ms Nerissa Mapes
Mr Barrie Marshall
Mr John Marshall AM
Ms Josephine Marshall
Professor Emeritus Jack Martin AO
Professor Ray Martin AO
Mr Erich Mayer AM
Mrs Netta McArthur
Dr Neville McCarthy AO
Professor James McCluskey
Ms Marie McDonald
Professor John McKenzie AM
Mrs Kate McMahon

Mr Tim McMahon
Professor Frederick Mendelsohn AO
Mrs Johanna Metcalf
Ms Kate Metcalf
Ms Mary Ann Metcalf
Professor Jacques Miller AC
Professor John Mills AO
Mr Robert Minter
Trustee, The Walter and Eliza Hall Trust
Professor Christina Mitchell
Dr Graham Mitchell AO
Dr Judith Mitchell
Mr Barry Moore
Mr Terry Moran AC
Mrs Barbara Morgan
Mr Hugh Morgan AC
Dr George Morstyn
Mr Bob Munro
Mr Tony Murphy
Ms Linda Nicholls AO
Dr Leslie Norins
Mrs Rainey Norins
Mr Colin North OAM
Lady Lyn Nossal
Mr Tom O'Brien AM
Ms Maureen O'Keefe
Sir Arvi Parbo AC
Professor David Penington AC
Professor Roger Pepperell
Mr David Percival
Professor Emeritus Jim Pittard AM
Lady Primrose Potter AC
Mr John Prescott AC
Mr John Pye
Mrs Edith Qualtrough
Mrs Cathy Quilici
Mr Denis Quilici
Professor Peter Rathjen
Ms Kate Redwood AM
Mr John Reid AO
Mr Dieter Rinke
Associate Professor Ken Roberts AM
Mr Michael Robinson AO
Ms Linda Rodger
Mrs Mary Rodger
Mrs Margaret Ross AM
Mr Fergus Ryan
Professor Graeme Ryan AC
Mr Colin Sakinofsky
Professor Nick Samaras
Mrs Pam Sargood
Mr Keith Satterley
Professor Carl Schedvin
Ms Anne Schumacher
Trustee, The Walter and Eliza Hall Trust
Mrs Carol Schwartz AM
Dr Roland Scollay
Mr Andrew Scott
Professor John Scott AO
Dr Paul Scown
Mrs Sam Sharman
Ms Deborah Sims
Mrs Lousje Skala
Mr Steven Skala AO
Professor Stephen Smith
Mr Jack Smorgon AO
Mr Robert Smorgon AM
Mrs Sally Speed
Professor Terry Speed
Miss Ann Sprague
Mr Geoffrey Stewardson
Dr John Stocker AO
Ms Jenny Strangward
Mr John Stratton
Ms Kate Summers
Ms Helen Sykes
Ms Jenny Tatchell
Mr Bruce Teele
Mrs Cheryl Thomas
Mr Chris Thomas AM
Ms Carolyn Viney
Mr John Walker QC
Mr Stanley Wallis AC
Ms Catherine Walter AM
Mr John Walter
Mr John Warburton
Mr Robert Warren
Mrs Catherine Watt
Ms Marion Webster OAM
Mr Kevin Weight
Professor Richard Wettenhall
Dr Senga Whittingham
Mr David Williamson
Mr Malcolm Williamson
Professor Robert Williamson AO
Professor Ingrid Winship
Ms Sally Wood
Mr Peter Worcester
Mr Rob Wylie

The Institute remembers those members who have passed away since 2017

Mrs Avis Macphee AM
Mrs Jo Metcalf

Institute organisation 31 December 2017



Institute divisions and laboratory heads

ACRF Chemical Biology division

Division heads

Professor Benjamin Kile (to April 2017)

Associate Professor Guillaume Lessene

Laboratory heads

Associate Professor Chris Burns, visiting scientist

Dr Ethan Goddard-Borger

Dr Isabelle Lucet (jointly with Structural Biology division)

Professor Keith Watson, honorary

ACRF Stem Cells and Cancer division

Division heads

Professor Geoff Lindeman

Professor Jane Visvader

Laboratory heads

Dr Marie-Liesse Asselin-Labat

Professor Clare Scott

Dr Kate Sutherland

Bioinformatics division

Division heads

Professor Gordon Smyth

Laboratory heads

Dr Melissa Davis

Professor Tony Papenfuss

Associate Professor Wei Shi

Professor Terry Speed, honorary

Cancer and Haematology division

Division heads

Professor Warren Alexander

Professor Nick Nicola

Laboratory heads

Associate Professor Jeff Babon (jointly with Structural Biology division)

Professor David Huang

Dr Emma Josefsson

Dr Ian Majewski

Professor Andrew Roberts

Dr Samir Taoudi (jointly with Molecular Medicine division)

Professor Christine Wells, honorary (jointly with Molecular Medicine division)

Cell Signalling and Cell Death division

Division heads

Professor John Silke

Professor David Vaux

Laboratory heads

Associate Professor Grant Dewson

Associate Professor James Murphy

Development and Cancer division

Division head

Associate Professor Anne Voss

Laboratory heads

Dr Leigh Coultas

Associate Professor Joan Heath

Associate Professor Tim Thomas

Immunology division

Division head

Professor Phil Hodgkin

Laboratory heads

Dr Bob Anderson, honorary

Associate Professor Daniel Gray (jointly with Molecular Genetics of Cancer division)

Dr Joanna Groom (jointly with Molecular Immunology division)

Associate Professor Edwin Hawkins

Dr Misty Jenkins

Professor Andrew Lew

Emeritus Professor Jacques Miller

Dr Shalin Naik (jointly with Molecular Medicine division)

Professor Ken Shortman, honorary

Dr Jason Tye-Din

Infection and Immunity division

Divsion heads

Professor Alan Cowman

Professor Marc Pellegrini

Laboratory heads

Associate Professor Justin Boddey

Dr Diana Hansen

Dr Sant-Rayn Pasricha (jointly with Population Health and Immunity division)

Associate Professor Wai-Hong Tham

Associate Professor Chris Tonkin

Inflammation division

Division head

Professor Ian Wicks

Laboratory heads

Associate Professor Seth Masters

Associate Professor Sandra Nicholson

Dr Tracy Putoczki

Dr James Vince

Molecular Genetics of Cancer division

Division heads

Professor Andreas Strasser

Professor Jerry Adams

Laboratory heads

Dr Philippe Bouillet

Professor Suzanne Cory (honorary distinguished research fellow)

Associate Professor Daniel Gray (jointly with Immunology division)

Associate Professor Marco Herold

Dr Ruth Kluck

Molecular Immunology division

Division head

Professor Stephen Nutt

Laboratory heads

Dr Rhys Allan (jointly with Molecular Immunology division)

Professor Gabrielle Belz

Professor Lynn Corcoran

Dr Joanna Groom (jointly with Immunology division)

Professor Axel Kallies (to July 2017)

Associate Professor Nicholas Huntington

Professor Li Wu, visiting scientist

Molecular Medicine division

Division heads

Associate Professor Marnie Blewitt

Professor Doug Hilton

Laboratory heads

Dr Rhys Allan (jointly with Molecular Immunology division)

Dr Shalin Naik (jointly with Immunology division)

Dr Matthew Ritchie

Dr Samir Taoudi (jointly with Cancer and Haematology division)

Professor Christine Wells, honorary (jointly with Cancer and Haematology division)

Population Health and Immunity division

Division heads

Professor Melanie Bahlo

Professor Ivo Mueller

Laboratory heads

Associate Professor Alyssa Barry

Professor Len Harrison

Associate Professor Aaron Jex

Dr Sant-Rayn Pasricha (jointly with Infection and Immunity division)

Dr Leanne Robinson

Professor Louis Schofield (to January 2017)

Structural Biology division

Division heads

Professor Peter Colman (to June 2017)

Associate Professor Matthew Call (from July 2017)

Associate Professor Peter Czabotar (from July 2017)

Laboratory heads

Associate Professor Jeff Babon (jointly with Cancer and Haematology division)

Professor Antony Burgess

Dr Melissa Call

Dr Jacqui Gulbis

Associate Professor Mike Lawrence

Dr Isabelle Lucet (jointly with ACRF Chemical Biology division)

Dr Colin Ward, associate research fellow (passed away March 2017)

Systems Biology and Personalised Medicine

Division heads

Professor Liam O'Connor (to March 2017)

Associate Professor Oliver Sieber (acting, from March 2017)

Dr Andrew Webb (acting, from March 2017)

Laboratory heads

Professor Peter Gibbs

Mr Simon Monard

Dr Kelly Rogers

Dr Hélène Jousset Sabroux

Dr Ian Street

Dr Stephen Wilcox

2017 Board Subcommittees 31 December 2017

Advocacy and Support Committee

Mr John Dyson (chair)
Mrs Sally Bruce
Associate Professor Paul Cooper
Ms Anna Chung
Mr Michael Daddo
Professor Doug Hilton AO
Mr Hugh Hodges
Ms Caroline Johnston
Ms Andrea Lapidge
Ms Samantha Ludolf
Ms Carolyn MacDonald
Mr John Marshall AM
Ms Carmela Monger
Ms Catherine Robson
Mr Christopher Thomas AM
Ms Susanne Williamson
Ms Sue Cameron (minutes)

Audit and Risk Committee

Mr Robert Wylie (chair)
Mr Malcolm Broomhead
Mr Ian Coulson
Ms Jane Hemstritch
Professor Doug Hilton AO
Mr Tom Imbesi (Deloitte)
Ms Samantha Ludolf
Mr Christopher Thomas AM
Ms Anneke Du Toit (Deloitte)
Mr Stan Balbata (minutes)

Commercialisation Committee

Dr Graham Mitchell AO (chair)
Professor Peter Colman AC
Dr Leigh Farrell
Ms Lisa Hennessy (independent member)
Professor Doug Hilton AO
Ms Samantha Ludolf
Dr George Morstyn
Professor Nick Nicola AO
Dr John Raff
Ms Carmela Monger (minutes)

Human Research Ethics Committee

Professor Rufus Black (chair)
Reverend Father Michael Elligate (deputy chair)
Dr John Bonacci
Dr Vanessa Bryant
Mr David Freeman
Dr Emma Josefsson
Dr Ian Majewski
Mrs Netta McArthur
Professor Marc Pellegrini
Ms Moira Rayner
Ms. Kimberley Walsh
Professor Ingrid Winship
Ms Sue Cameron (minutes)
Professor Doug Hilton AO (observer)
Dr Lina Laskos (observer)
Professor David Vaux AO (observer)

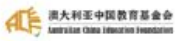
Investment Committee

Mr Robert Wylie (chair)
Mr Adam Blennerhassett (JBWere)
Mr Malcolm Broomhead
Mr Ian Coulson
Professor Doug Hilton AO
Ms Samantha Ludolf
Mr Stephen Merlicek
Mr Stephen Milburn-Pyle
Mr Andrew Scott
Mr Christopher Thomas AM
Ms Fiona Trafford-Walker
Mr Peter Worcester
Ms Anna Chung (minutes)

Remuneration Committee

Mr Christopher Thomas AM (chair)
Professor Rufus Black
Mr Terry Moran AC

The Walter and Eliza Hall Institute acknowledges the support of the following organisations, which contributed $10,000 or more to our research in 2017



The Walter and Eliza Hall Institute is associated with the following organisations

THE UNIVERSITY OF MELBOURNE

MELBOURNE HEALTH

agrf

Athena SWAN Member

BIOMEDICAL RESEARCH VICTORIA

BIOGRID AUSTRALIA

Cancer Therapeutics CRC

Cancer Trials Australia

CareerTrackers Indigenous Internship Program

CART-WHEEL

CATALYST therapeutics

GTAC GENE TECHNOLOGY ACCESS CENTRE

THE HEARING CRC

Male Champions of Change Victoria

MRCF

Melbourne Genomics Health Alliance

MUSEUMS VICTORIA

ORMOND COLLEGE THE UNIVERSITY OF MELBOURNE

Type 1 Diabetes TrialNet

SupplyNation MEMBER

VICTORIAN BREAST CANCER RESEARCH CONSORTIUM

Victorian Cancer Biobank

VICTORIAN COMPREHENSIVE CANCER CENTRE

In-kind support was received from these organisations

CCB 中国建设银行 China Construction Bank

Deloitte.

EgonZehnder

HARRY M. HEARN AM SOLICITOR

JBWere

pwc

Southview

SPP

Walter+Eliza Hall
Institute of Medical Research
DISCOVERIES FOR HUMANITY

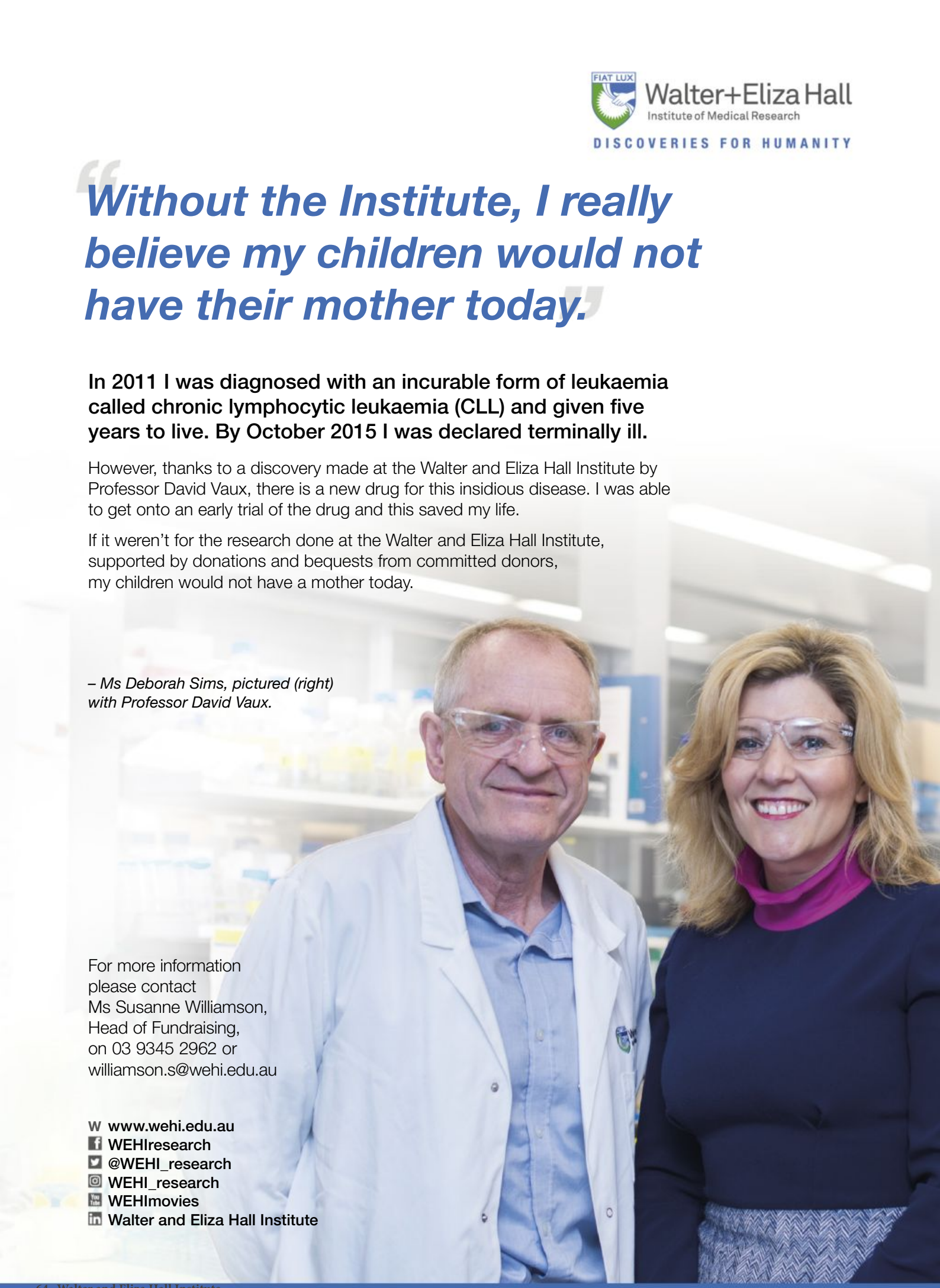
"Without the Institute, I really believe my children would not have their mother today."

In 2011 I was diagnosed with an incurable form of leukaemia called chronic lymphocytic leukaemia (CLL) and given five years to live. By October 2015 I was declared terminally ill.

However, thanks to a discovery made at the Walter and Eliza Hall Institute by Professor David Vaux, there is a new drug for this insidious disease. I was able to get onto an early trial of the drug and this saved my life.

If it weren't for the research done at the Walter and Eliza Hall Institute, supported by donations and bequests from committed donors, my children would not have a mother today.

– Ms Deborah Sims, pictured (right) with Professor David Vaux.



For more information please contact Ms Susanne Williamson, Head of Fundraising, on 03 9345 2962 or williamson.s@wehi.edu.au

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Walter and Eliza Hall Institute

CANCER | IMMUNE DISORDERS | INFECTIOUS DISEASE

Walter+Eliza Hall
Institute of Medical Research

DISCOVERIES FOR HUMANITY

ANNUAL REPORT
2017 Financial Statements

CANCER

IMMUNE DISORDERS

INFECTIOUS DISEASE

CONTENTS

NOTE

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La Trobe R&D Park
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Walter and Eliza Hall Institute

ABN 12 004 251 423

Produced by the Walter and Eliza Hall Institute's Communications and Marketing department

We acknowledge the traditional owners and custodians of the land on which our campuses are located, the Wurundjeri people of the Kulin nation, and pay our respects to their elders past and present.

Statement of profit or loss and other comprehensive income for the year ended 31 December 2017

Operating revenue	Note	2017 $'000	2016 $'000
Government revenue			
National Health and Medical Research Council		41,355	46,161
Cooperative Research Centres		2,238	1,551
Other Australian Government grants		1,058	1,347
Other Australian Government fellowships		512	2,020
Victorian Government grants		12,739	7,753
Foreign Government grants and fellowships		243	1
		58,145	**58,833**
Other grant revenue			
Industrial grants and contracts		4,044	3,227
Philanthropic grants and fellowships – Australia		7,444	8,804
Philanthropic grants and fellowships – International		6,468	5,805
		17,956	**17,836**
Other revenue			
Investment income	2	12,118	13,463
Royalty income		11,059	12,328
General income		7,560	5,746
Donations and bequests		9,327	8,816
		40,064	**40,353**
Total operating revenue before monetisation		**116,165**	**117,022**
Royalty monetisation income (venetoclax)	5	**331,082**	**-**
Total operating revenue		**447,247**	**117,022**

The financial statements are to be read in conjunction with the notes to, and forming part of the financial statements.

Operating expenditure	Note	2017 $'000	2016 $'000
Scientific laboratories			
Staff costs		59,328	56,141
Apparatus and equipment		2,980	2,608
Consumable supplies		12,485	11,488
Other expenses		3,917	3,332
		78,710	**73,569**
Support laboratories			
Staff costs		15,742	14,844
Apparatus and equipment		1,067	1,002
Consumable supplies		1,694	1,850
Other expenses		2,660	2,356
		21,163	**20,052**
Professional services			
Staff costs		9,480	9,472
Furniture and equipment		194	179
Building operating costs and maintenance		4,849	4,673
Other expenses		4,873	5,974
		19,396	**20,298**
Strategic initiatives			
Staff costs		658	194
Furniture and equipment		27	9
Other expenses		844	230
		1,529	**433**
Doubtful debts writeback	8(b)	(47)	(115)
Total operating expenditure before monetisation		**120,751**	**114,237**
Royalty monetisation (venetoclax)			
Net commercial income distributions to inventors and staff	5	41,930	-
Unrealised foreign exchange loss	5	4,130	-
Adviser and legal fees	5	3,830	-
Consultants and other expenses	5	1,253	-
		51,143	**-**
Total operating expenditure		**171,894**	**114,237**
Surplus from operations		**275,353**	**2,785**
Other income	3	5,002	8,671
Depreciation and amortisation	11	(9,044)	(8,556)
Impairment write-down of available-for-sale financial assets		-	(709)
Bequests and grants for capital works		7,207	6,895
Net surplus for the period	16(a)	**278,518**	**9,086**
Other comprehensive income			
Items that may be reclassified subsequently to profit or loss			
Gain on available-for-sale financial assets taken to equity	16(h)	11,551	8,441
Cumulative gain reclassified to profit or loss on sale of available for sale financial assets	16(h)	(5,091)	(9,892)
Transfer impairment write-down of available-for-sale financial assets	16(h)	-	539
Total comprehensive income for the year		**284,978**	**8,174**

The financial statements are to be read in conjunction with the notes to, and forming part of the financial statements.

Statement of financial position as at 31 December 2017

Assets	Note	2017 $'000	2016 $'000
Current assets			
Cash and cash equivalents	17(a)	344,746	32,849
Current tax assets	8(a)	1,387	2,735
Trade and other receivables	8(b)	6,742	4,409
Prepayments		980	515
Properties held for sale	25	-	105
Prepaid operating lease	9	32	32
Total current assets		**353,887**	**40,645**
Non-current assets			
Other financial assets	10	233,412	221,732
Property, plant and equipment	11	187,601	180,640
Prepaid operating lease	9	2,576	2,608
Total non-current assets		**423,589**	**404,980**
Total assets		**777,476**	**445,625**
Liabilities			
Current liabilities			
Trade and other payables	12	10,176	5,503
Provisions	13	23,592	20,232
Unearned grants and fellowships	14	23,343	24,525
Other liabilities	15	310	257
Total current liabilities		**57,421**	**50,517**
Non-current liabilities			
Provisions	13	41,871	1,902
Total non-current liabilities		**41,871**	**1,902**
Total liabilities		**99,292**	**52,419**
Net assets		**678,184**	**393,206**
Funds			
Permanent invested funds	16(b)	185,610	181,162
General funds	16(c)	378,204	114,306
Royalty fund	16(d)	44,410	34,981
Leadership fund	16(e)	24,562	23,581
Discovery fund	16(f)	4,545	2,682
Child care centre fund	16(g)	-	2,101
Investment revaluation reserve	16(h)	40,853	34,393
Total funds		**678,184**	**393,206**

The financial statements are to be read in conjunction with the notes to, and forming part of the financial statements.

Statement of cash flows for the year ended 31 December 2017

	Note	2017	2016
Cash flows from operating activities		**$'000**	**$'000**
Donations and bequests		7,945	7,898
General income		6,611	6,321
Receipts from granting bodies		79,167	74,598
GST paid to ATO		(3,102)	(4,998)
Payments to suppliers and employees		(119,894)	(109,013)
Royalty receipts		338,196	9,360
Dividends received		10,582	11,131
Interest and bill discounts received		3,955	3,118
Net cash (used in)/provided by operating activities	17(b)	**323,460**	**(1,585)**
Cash flows from investing activities			
Payment for other financial assets		(19,328)	(41,280)
Proceeds on sale of other financial assets		20,723	37,549
Grants and donations for property, plant and equipment		4,330	1,733
Payment for property, plant and equipment		(16,078)	(9,960)
Net cash (used in)/provided by investing activities		**(10,353)**	**(11,958)**
Cash flows from financing activities			
Donations and bequests to permanent invested funds		2,877	5,162
Net cash provided by financing activities		**2,877**	**5,162**
Net increase/(decrease) in cash held		**315,984**	**(8,381)**
Cash and cash equivalents at the beginning of the year		**32,592**	**40,236**
Effects of exchange rate changes on the balance of cash held in foreign currencies		(4,140)	737
Cash and cash equivalents at the end of the year	17(a)	**344,436**	**32,592**

The financial statements are to be read in conjunction with the notes to, and forming part of the financial statements.

Statement of changes in equity for the year ended 31 December 2017

	Permanent fund	General fund	Royalty fund	Leadership fund	Discovery fund	Child care centre fund	Investment revaluation reserve	Total
Balance at 31 December 2015	168,392	130,122	26,169	21,682	2,362	1,000	35,305	**385,032**
Surplus/(deficit) for the year	12,770	(15,816)	8,812	1,899	320	1,101	-	**9,086**
Other comprehensive income for the year								
Gain / (loss) on available-for-sale investments	-	-	-	-	-	-	8,441	**8,441**
Cumulative (gain) reclassified to profit or loss on sale of available for sale financial assets	-	-	-	-	-	-	(9,892)	**(9,892)**
Transfer impairment write down of available-for-sale financial assets	-	-	-	-	-	-	539	**539**
Total comprehensive income/(loss) for the year	**12,770**	**(15,816)**	**8,812**	**1,899**	**320**	**1,101**	**(912)**	**8,174**
Balance at 31 December 2016	**181,162**	**114,306**	**34,981**	**23,581**	**2,682**	**2,101**	**34,393**	**393,206**
Transfers not reflected in current year surplus	-	2,971	-	-	-	(2,971)	-	-
Surplus/(deficit) for the year	4,448	260,927	9,429	981	1,863	870	-	**278,518**
Other comprehensive income for the year								
Gain / (loss) on available-for-sale investments	-	-	-	-	-	-	11,551	**11,551**
Cumulative (gain) reclassified to profit or loss on sale of available for sale financial assets	-	-	-	-	-	-	(5,091)	**(5,091)**
Total comprehensive income/(loss) for the year	**4,448**	**263,898**	**9,429**	**981**	**1,863**	**(2,101)**	**6,460**	**284,978**
Balance at 31 December 2017	**185,610**	**378,204**	**44,410**	**24,562**	**4,545**	**-**	**40,853**	**678,184**

The financial statements are to be read in conjunction with the notes to, and forming part of the financial statements.

Notes to the annual accounts for the year ended 31 December 2017

1. Statement of significant accounting policies

The Walter and Eliza Hall Institute of Medical Research ('the Institute') is incorporated in Victoria as a company limited by guarantee. The Institute has 222 members and the guarantee is limited to two dollars per member.

The financial report is a general purpose financial report in accordance with the Australian Charities and Not-for-profits Commission Act 2012, Australian Accounting Standards (AASs) and complies with other requirements of the law. Accounting Standards include Australian equivalents to International Financial Reporting Standards (A-IFRS). The Institute is exempt from taxation. The Institute is a not-for-profit entity.

The financial statements were authorised for issue by the directors on 30 April 2018.

The financial report has been prepared on the basis of historical cost except for the revaluation of certain non-current assets and financial instruments. Cost is based on the fair values of consideration given in exchange for assets.

The Institute is a company of the kind referred to in ASIC Corporations (Rounding in Financial/Directors' Reports) Instrument 2016/191 dated 24 March 2016, and in accordance with that Instrument amounts in the financial report are rounded to the nearest thousand dollars, unless otherwise indicated.

Accounting policies are selected and applied in a manner which ensures that the resulting financial information satisfies the concepts of relevance and reliability, thereby ensuring that the substance of the underlying transactions or other events is reported.

The following significant accounting policies have been adopted in the preparation and presentation of the financial report:

(a) Reporting Entity

The financial statements include all the activities of The Walter and Eliza Hall Institute of Medical Research.

Principal address of the Institute is:

1G Royal Parade

Parkville, Victoria, 3052

(b) Property, plant and equipment

Property, plant and equipment held for use in research, or for administrative purposes, are stated in the statement of financial position at cost, less any subsequent accumulated depreciation.

Depreciation is provided on property, plant and equipment. Depreciation is calculated on a straight-line basis so as to write off the net cost of each asset over its expected useful life.

A regular review of useful lives, depreciation rates and residual values is conducted at each year end, with the effect of any changes in estimate accounted for on a prospective basis.

The following table indicates the expected useful lives of non current assets on which the depreciation charges are based.

	2017	2016
Buildings	20 - 40 years	20 - 40 years
Plant and equipment	3 - 20 years	3 - 20 years
Furniture and fittings	5 - 20 years	5 - 20 years

Land leased at Parkville is recognised as part of property, plant and equipment at fair value. Subsequent measurement will be under the cost method, whereby the assets will not be revalued.

(c) Acquisition of assets

Assets acquired are recorded at the cost of acquisition, being the purchase consideration determined as at the date of acquisition plus costs incidental to the acquisition. Items of property, plant and equipment are recorded at cost less accumulated depreciation.

(d) Source of capital funds

The Institute is a company limited by guarantee and as such has no issued capital.

(i) General Funds consist of the net accumulation of surpluses and deficits of prior years.

(ii) Permanent Invested Funds originate from gifts and bequests, the income from which is applied as stipulated by the donor, or to general research where there is no specific stipulation. These gifts and bequests are appropriated to Capital Funds.

(iii) The Royalty Fund consists of the balance of royalties received in respect of patented inventions and not expended.

(iv) The Leadership Fund consists of donations and income earned thereon. The Leadership Fund was established in honour of Professors Gustav Nossal, Donald Metcalf, Jacques Miller and Suzanne Cory to provide named fellowships to nurture the development of outstanding young scientists with the potential to be future leaders of biomedical research.

(v) The Discovery Fund consists of donations and income earned thereon, less funds spent on research to date. The Fund was established by the Institute to support specialist research and will be applied based on the merits of submissions to the Institute Director. There are three areas of focus; early drug discovery, blue sky basic biological research and technical innovation.

(vi) The Child Care Centre Fund consists of donations received in support of the construction of a child care centre on the institute's premises in Parkville. This fund was fully utilised during the year.

(v) The Investment Revaluation Reserve consists of gains and losses recognised through movement in the fair value of investments and other financial assets.

(e) Revenue recognition

Grants

Government and other funds received often have conditions attached for specific services to be performed. These agreements are considered reciprocal and as such, revenue is only recognised once the services have been performed, typically being the expenditure incurred in relation to the specific grant. Until such point, revenue is recorded as deferred income. For all other grants, revenue is fully recognised and not deferred.

Sale of goods and disposal of assets

Revenue from the sale of goods and disposal of assets is recognised when goods are delivered and legal title has passed.

Rendering of services

Revenue from a contract to provide services is recognised by reference to the stage of completion of the contract.

Royalties

Royalty income is recognised when received.

Contributions of assets

Revenue arising from the contribution of assets is recognised when the Institute gains control of the contribution.

Donations and bequests

Donation and bequest income is recognised on receipt of the donation or bequest. They are disclosed as part of operating revenue, except for, where stipulated by the donor or bequestor, certain amounts are treated as donations and bequests for capital works and are appropriated to Permanent Funds.

(f) Investments and other financial assets

All investments are initially measured at fair value plus transaction costs. After initial recognition, investments are measured at fair value. Gains or losses on investments held are recognised in the Investment Revaluation Reserve. For assets that are actively traded in organised financial markets, fair value is determined by reference to the Stock Exchange quoted market bid prices at the close of business on balance date.

(i) Available-for-sale financial assets

Shares and other investments held by the Institute are classified as being available-for-sale and are stated at fair value. Fair value is determined in the manner described in note 23(j). Gains and losses arising from changes in fair value are recognised directly in the investment revaluation reserve with the exception of impairment losses which are recognised in profit or loss. Where the investment is disposed of or is determined to be impaired, the cumulative gain or loss previously accumulated in the investment revaluation reserve is reclassified to profit or loss.

(ii) Impairment of financial assets

Financial assets, other than those at fair value through profit or loss, are assessed for indicators of impairment at each balance sheet date. Financial assets are impaired where there is objective evidence that as a result of one or more events that occurred after initial recognition of the financial asset the estimated future cash flows of the investment have been impacted. Financial assets held below cost, by 20% or more, or for greater than 12 months are considered impaired and adjusted through profit and loss. Such impairment loss will not be reversed in subsequent periods.

(iii) Term Deposits are recorded at amortised cost, with revenue recognised on an accruals basis.

(iv) Dividend revenue is recognised when the dividend is received. Interest revenue is recognised and accrued on a time proportionate basis that takes into account the effective yield on the financial asset.

(v) Interests in jointly controlled assets or operations

In respect of any interest in jointly controlled assets, the Institute does not consolidate but recognises in the financial statements:
- its share of jointly controlled assets;
- any liabilities that it had incurred;
- its share of liabilities incurred jointly by the joint venture;
- any income earned from the selling or using of its share of the output from the joint venture; and
- any expenses incurred in relation to being an investor in the joint venture.

For jointly controlled operations, the Institute recognises: the assets that it controls and the liabilities that it incurs; expenses that it incurs; and its share of income that it earns from selling outputs of the joint venture.

(g) Cash and cash equivalents

Cash comprises cash on hand and on-demand deposits. Cash equivalents are short-term, highly liquid investments that are readily convertible to known amounts of cash, which are subject to an insignificant risk of changes in value and have a maturity of three months or less at the date of acquisition.

(h) Trade and Other Receivables

Trade and other receivables are recognised initially at fair value and subsequently measured at amortised cost using the effective interest rate method less provision for impairment.

(i) Trade and Other Payables

Trade payables and other accounts payables are initially measured at fair value and then subsequently carried at amortised cost. They are recognised when the Institute becomes obliged to make future payments resulting from the purchase of goods and services.

(j) Research costs

Research costs are recognised as an expense when incurred and reported in the financial year in which they relate.

(k) Goods and Services Tax (GST)

Revenues, expenses and assets are recognised net of the amount of GST except:

(i) where the amount of GST incurred is not recoverable from the taxation authority, it is recognised as part of the cost of acquisition of an asset or as part of an item of expense; or

(ii) for receivables and payables which are recognised inclusive of GST.

The net amount of GST recoverable from, or payable to, the taxation authority is included as part of receivables or payables. Cash flows are included in the statement of cash flows on a gross basis. The GST component of cash flows arising from investing and financing activities which is recoverable from, or payable to, the taxation authority is classified within operating cash flows.

(l) Provisions

Provisions are recognised when there is a present obligation (legal or constructive) as a result of a past event, it is probable that the organisation is required to settle the obligation, and a reliable estimate can be made of the amount of the obligation. The amount recognised as a provision is the best estimate of the consideration required to settle the present obligation at the end of the reporting period, taking into account the risks and uncertainties surrounding the obligation. When a provision is measured using the cash flows estimated to settle the present obligation, its carrying amount is the present value of those cash flows (where the effect of the time value of money is material).

(m) Employee benefits

Provision is made for benefits accruing to employees in respect of annual leave and long service leave, when it is probable that settlement will be required and they are capable of being measured reliably.

Provisions made in respect to annual leave and long service leave expected to be settled within 12 months, are measured at their nominal values, using the remuneration rate expected to apply at the time of settlement.

Provisions made in respect to long service leave which are not expected to be settled within 12 months are measured at the present value of the estimated future cash outflows to be made by the Institute in respect of services provided by employees up to the reporting date.

(n) Foreign currency

All foreign currency transactions during the financial year are brought to account using the exchange rate in effect at the date of the transaction. Foreign currency monetary items at reporting date are translated at the exchange rate existing at that date and exchange differences are recognised in the net surplus or deficit in the period in which they arise.

(o) Leased assets

Operating lease payments are recognised as an expense on a straight-line basis which reflects the pattern in which economic benefits from the leased asset are consumed.

(p) Impairment of non-financial assets

All assets are assessed annually for indications of impairment. If there is an indication of impairment, the assets concerned are tested as to whether their carrying value exceeds their possible recoverable amount. Where an asset's carrying value exceeds its recoverable amount, the difference is written-off as an expense. The recoverable amount for most assets is measured at the higher of value in use and fair value less costs to sell. Depreciated replacement cost is used to determine value in use. Depreciated replacement cost is the current replacement cost of an item of plant and equipment less, where applicable, accumulated depreciation to date, calculated on the basis of such cost.

(q) Properties held for sale

Properties are classified as held for sale when they are immediately available for sale in their present condition and their sale is highly probable and expected to be completed within 12 months of the Institute's reporting date.

The properties are valued at fair value less costs to sell.

(r) Critical accounting judgements and key sources of estimation uncertainty

In the application of the Institute's accounting policies, which are described above, management may from time to time make judgements, estimates and assumptions about the carrying values of assets and liabilities that may not be readily apparent from other sources. The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances, the result of which form the basis of making the judgement. Key areas in which management has exercised judgement include the calculation of the fair value of financial assets, the carrying value of employee benefits, and the carrying value of provisions for royalties.

(s) Impact of new and revised Accounting Standards

The Institute has adopted all of the new and revised standards and interpretations issued by the Australian Accounting Standards Board (the AASB) that are relevant to its operations and effective for the current reporting period.

New and revised Standards and amendments thereof and Interpretations effective for the current reporting period that are relevant to the Institute include:

- AASB 1057 Application of Australian Accounting Standards and AASB 2015-9 Amendments to Australian Accounting Standards – Scope and Application Paragraphs
- AASB 2014-4 Amendments to Australian Accounting Standards – Clarification of Acceptable Methods of Depreciation and Amortisation
- AASB 2015-1 Amendments to Australian Accounting Standards – Annual Improvements to Australian Accounting Standards 2012-2014 Cycle
- AASB 2015-2 Amendments to Australian Accounting Standards – Disclosure Initiative: Amendments to AASB 101
- AASB 2014-3 Amendments to Australian Accounting Standards – Accounting for Acquisitions if Interests in Joint Operations
- AASB 2016-2 Amendments to Australian Accounting Standards – Disclosure Initiative: Amendments to AASB 107
- AASB 2016-4 Amendments to Australian Accounting Standards - Recoverable Amount of Non-Cash-Generating Specialised Assets of Not-for-Profit Entities
- AASB 2017-2 Amendments to Australian Accounting Standards – Further Annual Improvements 2014-2016 Cycle

The application of these amendments has had no financial impact in the current period.

Standards and interpretations issued not yet effective

At the date of authorisation of the financial report, the standards and interpretations that are relevant to the Institute, listed below, were on issue but not yet effective.

The Institute is currently performing an assessment of the financial impacts and disclosures from the application of the new standards and their amendments on the financial reports.

Standard	Effective for annual reporting periods beginning on or after	Expected to be initially applied in the financial year ending
AASB 9 'Financial Instruments', and the relevant amending standards	1 January 2018	31 December 2018
The standard replaces AASB 139 Financial instruments: Recognition and Measurement. In December 2016, the AASB issued AASB 2016-8 Amendments to Australian Accounting Standards – Australian Implementation Guidance for Not-for-Profit Entities which introduced not-for-profit specific implementation guidance into AASB 9. The amendments to AASB 9 address the initial measurement and recognition of non-contractual receivables arising from statutory requirements. Such receivables include taxes, rates and fines. Key requirements of AASB 9: all financial assets that are within scope, are required to be subsequently measured at amortised cost of fair value. Specifically: - Debt investments that are held whose objective is to collect the contractual cash flows, and that have contractual cash flows that are solely payments of principal and interest on the principal outstanding are generally measured at amortised cost at the end of subsequent accounting periods - All other debt investments and equity investments are measured at their fair value at the end of subsequent accounting periods. In addition, under AASB 9, entities may make an irrevocable election to present subsequent changes in the fair value of an equity investment (that is not held for trading) in other comprehensive income, with only dividend income generally recognised in profit or loss. With regard to the measurement of financial liabilities designated as at fair value through profit or loss, AASB 9 requires that the amount of change in fair value of the financial liability that is attributable to changes in the credit risk of that liability is presented in other comprehensive income, unless the recognition of the effects of changes in the liability's credit risk in other comprehensive income would create or enlarge an accounting mismatch in profit or loss. Changes in fair value attributable to a financial liability's credit risk are not subsequently reclassified to profit or loss. Under AASB 139 Financial Instruments: Recognition and Measurement, the entire amount of the change in the fair value of the financial liability designated as fair value through profit or loss is presented in profit or loss.		
AASB 16 'Leases'	1 January 2019	31 December 2019
AASB 16 distinguishes leases and service contracts on the basis of whether an identified asset is controlled by a customer. Distinctions of operating leases (off balance sheet) and finance leases (on balance sheet) are removed for lessee accounting, and is replaced by a model where a right-of-use asset and a corresponding liability have to be recognised for all leases by lessees (i.e. all on balance sheet) except for short-term leases and leases of low value assets. The right-of-use asset is initially measured at cost and subsequently measured at cost (subject to certain exceptions) less accumulated depreciation and impairment losses, adjusted for any re-measurement of the lease liability. The lease liability is initially measured at the present value of the lease payments that are not paid at that date. Subsequently, the lease liability is adjusted for interest and lease payments, as well as the impact of lease modifications, amongst others. Furthermore, the classification of cash flows will also be affected as operating lease payments under AASB 117 are presented as operating cash flows; whereas under the AASB 16 model, the lease payments will be split into a principal and an interest portion which will be presented as financing and operating cash flows respectively. Specifically, for NFP entities AASB 16 Leases becoming effective, there will also be a change in how peppercorn leases (leases at significantly below-market terms and conditions) will be recognised and recorded whereby the benefit (i.e. fair value of the right to use the asset) of the full lease term is to be recognised.		

Standard	Effective for annual reporting periods beginning on or after	Expected to be initially applied in the financial year ending
AASB 15 'Revenue from Contracts with Customers' - AASB 2014-5 Amendments to Australian Accounting Standards arising from AASB 15 - AASB 2015-8 Amendments to Australian Accounting Standards – Effective date of AASB 15 - 2016-3 Amendments to Australian Accounting Standards – Clarifications to AASB 15 - AASB 2016-7 Amendments to Australian Accounting Standards – Deferral of AASB 15 for Not-for-Profit Entities - AASB 2016-8 Amendments to Australian Accounting Standards – Australian Implementation Guidance for Not-for-Profit Entities AASB 15 replaces all existing revenue requirements in Australian Accounting standards and applies to all revenue arising from contracts with customers, unless the contracts are in scope of other standards, such as AASB 117 (or AASB 16 Leases, once applied). The core principle of AASB 15 is that an entity should recognise revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services.	1 January 2019	31 December 2019
AASB 1058 'Income of Not-for-Profit Entities' AASB 1058 clarifies and simplifies the income recognition requirements that apply to not-for-profit (NFP) entities, in conjunction with AASB 15. These Standards supersede the NFP income recognition requirements previously in AASB 1004 as well as current revenue recognition guidance including AASB 118 Revenue, AASB 111 Construction Contracts and the related Interpretations when it becomes effective. The core principle of the new income recognition requirements under AASB 1058 is that where there is an 'enforceable' contract with a customer with 'sufficiently specific' performance obligations, income would be recognised when (or as) the performance obligations are satisfied under AASB 15. Should the transaction fall outside of the scope of AASB 15, then income would be recognised immediately under AASB 1058. It is anticipated the main revenue stream impacted will be grant income. NFP entities have a choice of applying the new standards retrospectively or to use a modified transition approach (with no restatement of comparatives).	1 January 2019	31 December 2019
AASB 2017-1 'Amendments to Australian Accounting Standards – Transfers of Investment Property, Annual Improvements 2014-2016 Cycle and Other Amendments' Amends the following standards: - AASB 140 Investment Property – change in use. - AASB 1 First-time Adoption of Australian Accounting Standards – deletion of exemptions for first-time adopters and addition of an exemption arising from Interpretation 22 Foreign Currency Transactions and Advance Consideration. - AASB 128 Investments in Associates and Joint Ventures – measuring an associate or joint venture at fair value.	1 January 2019	31 December 2019
AASB Interpretation 22 'Foreign Currency Transactions and Advance Consideration' The Interpretation clarifies how to determine the date of the transaction for the purpose of determining the exchange rate to use when recognising the receipt or payment of advance consideration in a foreign currency. The Interpretation requires an entity to determine the date of the transaction for the purpose of determining the exchange rate to use on initial recognition of the related asset, expense or income (or part of it) as the date on which the entity initially recognises the non-monetary asset or non-monetary liability arising from the payment or receive of advance consideration.	1 January 2019	31 December 2019

2. Income	2017 $'000	2016 $'000
The following has been prepared in support of the items of income shown in the statement of profit or loss and other comprehensive income.		
Investment income from investments received during the period:		
Recognised in surplus or deficit:		
Dividends and distributions income on available-for-sale financial assets	10,013	11,757
Interest income on available-for-sale financial assets	4,148	3,048
Realised foreign exchange gain	(10)	736
	14,151	**15,541**
Less transfer to grants and fellowships	(2,033)	(2,078)
Total as per statement of profit or loss and other comprehensive income	**12,118**	**13,463**

3. Other income		
Gain on sale of available-for-sale investments	5,002	8,671
Total other income	**5,002**	**8,671**

4. Operating expenses

The following items of expense are included in the net surplus.

Employee benefits expense		
Employee benefits expense	85,944	80,652
Depreciation of non-current property, plant and equipment		
Buildings	4,916	4,928
Plant and equipment	4,058	3,521
Furniture and fittings	70	107
Total depreciation	**9,044**	**8,556**
Operating lease		
Operating lease expense	32	32

5. Venetoclax monetisation

On 14 June 2017, the Institute entered into an agreement with CPPIB Credit Europe S.á r.l., a wholly owned subsidiary of Canada Pension Plan Investment Board (CPPIB), for the partial sale of royalty rights in an anti-cancer treatment known as venetoclax. Venetoclax is the result of a research collaboration with Genentech, a member of the Roche Group, and Abbvie and is based on ground-breaking scientific discoveries made at the Institute over three decades ago.

The monetisation arrangement resulted in a transaction that included a cash payment of US$250 million upfront and potential future milestone payments of up to US$75 million. The upfront cash payment has been recognised as income in the statement of profit or loss and other comprehensive income for the year ended 31 December 2017. A number of significant costs associated with the monetisation income have also been included in the statement of profit or loss and on the statement of financial position. These are detailed below:

Royalties Received	331,082	-
Less associated costs:		
Provision for distribution to inventors and staff	(41,930)	-
Unrealised foreign exchange loss	(4,130)	-
Adviser and legal fees	(3,830)	-
Consultants and other expenses	(1,253)	-
Net monetisation income	**279,939**	**-**

As a result of the Venetoclax monetisation transaction and the Institute's net commercial income distribution policy, commitments for payments to employees may be payable in future years, subject to Board approval. The nominal amount of the future commitments is $18,543k. Refer to note 13 for further details.

6. Directors' remuneration

The directors of the Walter and Eliza Hall Institute of Medical Research during the period were:

CW Thomas	MW Broomhead	C Kilpatrick	TF Moran
JS Hemstritch	R Doyle	J McCluskey	C Viney
RH Wylie	J Dyson	ME McDonald	IM Winship
RER Black	S Kapur	GF Mitchell	

The aggregate income paid or payable, or otherwise made available, in respect of the financial period, to all directors of the Institute, directly or indirectly, by the company or by any related party was nil (2016: nil).

Aggregate retirement benefits paid to all directors of the Institute, by the Institute or by any related party was nil (2016: nil).

7. Auditors' remuneration	2017 $	2016 $
Auditing the financial report	60,000	59,000
Other regulatory audit services	-	4,875
Non audit services	28,675	88,100
	88,675	**151,975**

8. Current assets	2017 $'000	2016 $'000
(a) Current tax assets		
Franking credits receivable	2,029	2,604
Current tax asset / (liability)	(642)	131
	1,387	**2,735**
(b) Trade and other receivables		
Sundry debtors	3,344	3,163
Accrued income	3,401	1,296
	6,745	**4,459**
Doubtful debts provision**	(3)	(50)
	6,742	**4,409**
** Movement in the provision for doubtful debts		
Balance at beginning of the year	50	147
Amounts written off during the year as uncollectible	-	(52)
Impairment losses reversed	(47)	(45)
Balance at end of the year	3	50
** Bad Debts Expense		
Amounts in provision for doubtful debts	(47)	(97)
Recovery of previous write offs	-	(18)
Bad debts expense/(writeback)	**(47)**	**(115)**

9. Operating leases

Operating leases relate to research facilities with lease terms of between 5 to 99 years, with an option to extend. All operating lease contracts contain market review clauses in the event that the Institute exercises its option to renew. The Institute does not have an option to purchase the leased asset at the expiry of the lease period. The operating leases are prepaid.

Non-cancellable operating leases		
Not longer than 1 year	32	32
Longer than 1 year and not longer than 5 years	128	128
Longer than 5 years	2,448	2,480
	2,608	**2,640**

10. Other financial assets	2017 $'000	2016 $'000
Non-quoted available-for-sale investments at fair value		
Floating rate securities	5,146	5,035
Shares	1,781	338
Quoted available-for-sale investments at fair value		
Shares	169,623	161,340
Floating rate securities	56,862	55,019
	233,412	**221,732**

(a) Fair value measurements recognised in the statement of financial position

The following table provides an analysis of financial instruments that are measured subsequent to initial recognition at fair value, grouped into levels 1 to 3 based on:

- Level 1 fair value measurements are those derived from quoted prices (unadjusted) in active markets for identical assets or liabilities.

- Level 2 fair value measurements are those derived from inputs other than those quoted prices included within level 1 that are observable for the asset, either directly (i.e. as prices) or indirectly (i.e. derived from prices)

- Level 3 fair value measurements are those derived from valuation techniques that include inputs for the asset that are not based on observable market data

Total	Level 1	Level 2	Level 3	2017 Total
Available for sale financial assets	**$'000**	**$'000**	**$'000**	**$'000**
Quoted shares	169,623	-	-	169,623
Floating rate securities	56,862	5,146	-	62,008
Unquoted shares*	-	-	1,781	1,781
Total	**226,485**	**5,146**	**1,781**	**233,412**

*As at 31 December 2017, the Institute held a 49% (2016: 49%) share of equity in Catalyst Therapeutics Pty Ltd, with a carrying value of $1,195k (2016: $120k). Anaxis Pharma Pty Ltd is a wholly owned subsidiary of Catalyst Therapeutics Pty Ltd. The Institute also held a 16.2% (2016: 16.2%) share of the equity in Murigen Pty Ltd, with a carrying value of $61k (2016: $61k).

(b) Reconciliation of level 3 fair value measurements of financial assets

	Available-for -sale unquoted equities	
	2017 $'000	2016 $'000
Opening balance	338	508
Purchases	-	-
Impairment	-	(37)
Revaluation	1,443	(133)
Closing balance	**1,781**	**338**

11. Property, plant and equipment

	Buildings	Work in progress	Plant and equipment	Furniture and fittings	Land Lease	Total
	$'000	$'000	$'000	$'000	$'000	$'000
Gross carrying amount						
Balance at 31 December 2015	178,341	1,541	49,038	1,619	16,200	246,739
Additions at cost	-	9,960	-	-	-	9,960
Transfers	439	(9,422)	8,593	390	-	-
Balance at 31 December 2016	**178,780**	**2,079**	**57,631**	**2,009**	**16,200**	**256,699**
Additions at cost	-	16,078	-	-	-	16,078
Transfers	2,604	(9,350)	6,708	38	-	-
Disposals	-	-	(1,851)	-	-	(1,851)
Balance at 31 December 2017	**181,384**	**8,807**	**62,488**	**2,047**	**16,200**	**270,926**
Accumulated depreciation						
Balance at 31 December 2015	(32,034)	-	(34,098)	(1,371)	-	(67,503)
Depreciation expense	(4,928)	-	(3,521)	(107)	-	(8,556)
Balance at 31 December 2016	**(36,962)**	**-**	**(37,619)**	**(1,478)**	**-**	**(76,059)**
Disposals	-	-	1,778	-	-	1,778
Depreciation expense	(4,916)	-	(4,058)	(70)	-	(9,044)
Balance at 31 December 2017	**(41,878)**	**-**	**(39,899)**	**(1,548)**	**-**	**(83,325)**
Carrying amounts						
As at 31 December 2016	**141,818**	**2,079**	**20,012**	**531**	**16,200**	**180,640**
As at 31 December 2017	**139,506**	**8,807**	**22,589**	**499**	**16,200**	**187,601**

Aggregate depreciation allocated, whether recognised as an expense or capitalised as part of the carrying amount of other assets during the period:

	2017	2016
	$'000	$'000
Buildings	4,916	4,928
Plant and equipment	4,058	3,521
Furniture and fittings	70	107
Total depreciation	**9,044**	**8,556**

	2017 $'000	2016 $'000
12. Trade and other payables		
Trade creditors	3,529	2,972
Accrued expenses	6,647	2,531
	10,176	**5,503**
13. Provisions		
The aggregate provisions recognised and included in the financial statements is as follows:		
Provision for net commercial income distribution	6,683	4,109
Provision for employee benefits*	16,909	16,123
Current provisions	**23,592**	**20,232**
Provision for employee benefits	2,271	1,902
Provision for net commercial income distribution	39,600	-
Non current provisions	**41,871**	**1,902**
	65,463	**22,134**

* Included in current provisions are $10,015K (2016: $9,356K) of long service leave for which current entitlement exists.

As a result of the Venetoclax monetisation transaction and the Institute's net commercial income distribution policy relating to distributions to employees, commitments may be payable in future years.

The extent to which an outflow of funds under these commitments will be required is dependent on: staff members remaining employed by the Institute, the number of eligible employees within the distribution period and Board approval. The amounts that may be payable (no amount has been recognised as a liability) are reported in nominal amounts below.

Potential payments by the Institute arising from net commercial income distribution to staff:		
Payable within 1 year	1,500	-
Payable between 1-5 years	5,043	-
Payable 5+ years	12,000	-
	18,543	**-**
Number of employees at end of financial period (full time equivalents)		
Staff	682	680
Visiting scientists	48	39
	730	**719**
14. Unearned grants and fellowships		
Grants and fellowships already committed and applicable to future periods:		
Grants	19,885	21,631
Fellowships	3,458	2,894
	23,343	**24,525**
15. Other liabilities		
Monies Held in Trust:		
Staff Salary Packaging deposits	310	257
	310	**257**

16. Capital movements

	Note	2017 $'000	2016 $'000
(a) The net surplus for the financial period is 278,518K (2016: $9,086K)			
This has been appropriated as follows:	Note		
Transfer to Permanent Invested Fund	16(b)	4,448	12,770
Transfer to/(from) General Fund	16(c)	260,927	(15,816)
Transfer to Royalty Fund	16(d)	9,429	8,812
Transfer to Leadership Fund	16(e)	981	1,899
Transfer to Discovery Fund	16(f)	1,863	320
Transfer to Child Care Centre Fund	16(g)	870	1,101
Total appropriations to funds		**278,518**	**9,086**
(b) Permanent Invested Fund			
Balance at beginning of period		181,162	168,392
Net surplus for period transferred from statement of profit or loss and other comprehensive income		4,448	12,770
Total Permanent Invested Fund		**185,610**	**181,162**
(c) General Fund			
Balance at beginning of period		114,306	130,122
Transfer not reflected in current year surplus		2,971	-
Net surplus for period transferred from statement of profit or loss and other comprehensive income		260,927	(15,816)
Total General Fund		**378,204**	**114,306**
(d) Royalty Fund			
Balance at beginning of period		34,981	26,169
Net surplus for period transferred from statement of profit or loss and other comprehensive income		9,429	8,812
Total Royalty Fund		**44,410**	**34,981**
(e) Leadership Fund			
Balance at beginning of period		23,581	21,682
Net surplus for period transferred from statement of profit or loss and other comprehensive income		981	1,899
Total Leadership Fund		**24,562**	**23,581**
(f) Discovery Fund			
Balance at beginning of period		2,682	2,362
Net surplus for period transferred from statement of profit or loss and other comprehensive income		1,863	320
Total Discovery Fund		**4,545**	**2,682**
(g) Child Care Centre Fund			
Balance at beginning of period		2,101	1,000
Transfer of funds for child care centre construction		(2,971)	
Net surplus for period transferred from statement of profit or loss and other comprehensive income		870	1,101
Total Child Care Centre Fund		**-**	**2,101**
(h) Investment revaluation reserve			
Balance at beginning of period		34,393	35,305
Valuation gain recognised for the period		11,551	8,441
Transfers to gain on sale of investment		(5,091)	(9,892)
Transfers due to loss on impairment		-	539
Total investment revaluation reserve		**40,853**	**34,393**
Total funds		**678,184**	**393,206**

17. Notes to statement of cash flows	2017 $'000	2016 $'000
(a) Reconciliation of cash and cash equivalents		
For the purposes of the statement of cash flows, cash includes cash on hand, cash at bank, monies held at trust (salary packaging bank account for staff) and investments in money market instruments, net of outstanding bank overdrafts.		
Cash at the end of the financial period as shown in the statement of cash flows is reconciled to the related items in the statement of financial position as follows:		
Cash	89,505	9,628
Deposits at call	5,847	7,221
Term deposits	249,394	16,000
	344,746	**32,849**
Represented by:		
Cash for Institute operations (as per Cash Flow Statement)	344,436	32,592
Cash balances not available for use		
Monies Held in Trust - Staff Salary Packaging Deposits	310	257
	344,746	**32,849**
(b) Reconciliation of net surplus to net cash flows from operating activities		
Net surplus	278,518	9,086
Depreciation	9,044	8,556
Donations and bequests moved to Permanent fund	(2,877)	(5,162)
Gain on sale of available-for-sale financial assets	(5,002)	(8,671)
Write down of available-for-sale investments	-	709
Increase in Investments – dividend reinvestment plans	(6)	(3)
Grants and donations for capital works	(4,330)	(1,733)
Donated financial assets	(1,430)	(1,118)
Prepaid operating leases	32	32
	273,949	**1,696**
Changes in net assets and liabilities:		
(Increase)/decrease in assets:		
Tax assets	575	(754)
Sundry debtors and prepayments	(692)	612
Income receivable	(2,105)	1,043
Foreign exchange gain/loss	4,140	(736)
Increase/(decrease) in liabilities:		
Trade payables	557	865
Accrued expenses	4,116	142
Tax liabilities	773	(395)
Current provisions	3,360	3,454
Other current liabilities (Grants)	(1,182)	(7,658)
Non-current provisions	39,969	146
Net cash from operating activities	**323,460**	**(1,585)**

(c) Non-cash financing and investing activities

During the financial period dividends of $6,372 (2016: $2,967) were reinvested as part of dividend and distribution reinvestment plans.

18. Economic dependency

The Institute is reliant upon grants from the Australian Government National Health and Medical Research Council for 32.8% of operating expenditure (2016: 41.5%) and the Victorian Government Department of State Health and Human Services, Business and Innovation for 9.0% of operating expenditure (2016: 5.7%) for support of its basic research activities.

19. Segment information

The Institute is a medical research organisation focussed on the nationally and globally significant areas of health being cancer, immune disorders and infectious diseases. All operations are predominantly in Australia.

20. Capital expenditure commitments	2017 $'000	2016 $'000
Not longer than 1 year	4,307	9,478
After 1 year but not more than 5 years	-	2,611
Total commitments	**4,307**	**12,089**

21. Related party disclosures

(a) Transactions with associates

The Institute received fees during the year from Catalyst Therapeutics Pty Ltd totalling $260,262 (2016: $445,181) for services rendered on normal commercial terms.

The Institute received royalties during the year from Anaxis Pharma Pty Ltd and Murigen Pty Ltd totalling $834,281 (2016: $161,716).

The Institute made equity contributions during the year to Catalyst Therapeutics Pty Ltd totalling $147,000 (2016: $312,375).

The Institute received a return of capital during the year from Catalyst Therapeutics Pty Ltd and Anaxis Pharma Pty Ltd totalling $763,641 (2016: $nil)

(b) Transactions with Directors and Director-related entities

During the year various Directors and Director-related entities made donations to the Institute totalling $605,659 (2016: $928,636).

(c) Compensation for key management personnel	2017	2016
The aggregate compensation of the key management personnel of the Institute is set out below:	$	$
Short-term employee benefits	1,708,099	1,324,330
Post-tax employment benefits	268,014	211,982
	1,976,113	**1,536,312**

22. Superannuation commitments

(a) Institute employees are members of a range of superannuation funds, which are divided into the following categories:

Those operative and open to membership by new employees:

- UniSuper – Accumulation Super (1)
- Other superannuation funds chosen by employees.

Those closed to future membership by Institute employees:

- Unisuper – Defined Benefit Division
- Unisuper – Accumulation Super (2)

(b) UniSuper plans

UniSuper is a multi employer superannuation fund operated by UniSuper Limited as the corporate trustee and administrated by UniSuper Management Pty Ltd, a wholly owned subsidiary of UniSuper Limited. The operations of UniSuper are regulated by the Superannuation Industry (Supervision) Act 1993.

(i) The UniSuper schemes known as the Defined Benefit Division or Accumulation Super (2) were only available to contributing members of the Walter and Eliza Hall Institute of Medical Research Superannuation Fund (1979) which closed in 2003.

(ii) The maximum contribution rate to the schemes is 24.5% of member's salary of which the member contributes 7.5% after tax and the Institute 17%.

(iii) UniSuper has advised that the Accumulation Super (2) and Defined Benefit Division plans are defined as multi-employer defined contribution schemes in accordance with AASB 119 Employee Benefits. AASB 119 Employee Benefits states that this is appropriate for a defined benefit plan where the employer does not have access to the information required and there is no reliable basis for allocating the benefits, liabilities, assets and costs between employers.

(iv) The number of members of the Walter and Eliza Hall Institute of Medical Research Superannuation Fund (1979) who became members of the UniSuper – Defined Benefit Division when the fund closed in 2003 was 204. The number of Institute employees who are members of the Defined Benefit Division as at 31 December 2017 was 78 (2016: 88).

(v) New employees who commenced after 1 July 2003 currently have a minimum contribution 9.5% of their annual salary contributed by the Institute to Accumulation Super (1) or to a fund of their choice prescribed under the Superannuation Guarantee Charge Act (1992).

(c) The total superannuation contributions by the Institute during the period in respect to the above plans were:	2017 $'000	2016 $'000
UniSuper – Defined Benefit Division	1,605	1,655
UniSuper – Accumulation Super (2)	344	355
UniSuper – Accumulation Super (1)	6,411	6,214
Other superannuation funds	562	383
Total	**8,922**	**8,607**

23. Financial instruments

(a) Significant accounting policies

Details of the significant accounting policies and methods adopted, including the criteria for recognition, the basis of measurement and the basis on which revenues and expenses are recognised, in respect of each class of financial asset and financial liability are disclosed in note 1 to the financial statements.

(b) Significant terms, conditions and objectives of derivative financial instruments

The Institute does not enter into or trade derivative financial instruments.

(c) Capital risk management

The Institute manages its capital to ensure it will be able to continue as a going concern whilst maximising its return on investment within the risk profile maintained by the Institute. The capital structure consists of permanent investment funds, retained earnings and reserves.

(d) Financial risk management

The Institute minimises financial risk through the charter given to the investment sub-committee. In line with this charter, the Institute invests short term funds in a appropriate combination of fixed and floating instruments.

(e) Interest rate risk management

The Institute is exposed to interest rate risk as it invests funds at both fixed and floating interest rates. The majority of financial assets in this class are bank accounts, term deposits and fixed interest securities with varying interest rates.

(f) Interest rate sensitivity analysis

The sensitivity analysis below has been determined based on the exposure to interest rates at the reporting date and the stipulated change taking place at the beginning of the financial year and held constant throughout the reporting period. A 25 basis point variation was used as the minimum point and 100 basis point variation as the maximum point. This is consistent with the management's view of interest rate sensitivity. A change in interest rates would impact net surplus as follows:

Interest rate risk	Minimum 25bp		Maximum 100bp	
	2017	2016	2017	2016
	$000's	$000's	$000's	$000's
Effect on surplus - rate decrease	(1,016)	(254)	(4,068)	(1,017)
Effect on surplus - rate increase	1,016	254	4,068	1,017

(g) Equity price sensitivity analysis

The sensitivity analysis below has been determined based on the exposure to equity price risks at the reporting date.

At reporting date, if the equity prices had been 5% higher / lower:

- net surplus for the year ended 31 December 2017 would have been unaffected as the equity investments are classified as available-for-sale; and

- investment revaluation reserve would decrease or increase by $8.5 million (2016: $8.1 million) mainly as a result of the changes in fair value of available-for-sale shares.

The Institute's sensitivity to equity prices has not changed significantly from the prior year.

(h) Credit risk management

Credit risk refers to the risk that a counterparty will default on its contractual obligations resulting in a financial loss to the Institute. The Institute has adopted a policy of only dealing with creditworthy counter parties as a means of mitigating the risk of financial loss from defaults. The Institute's exposure is continuously monitored and reviewed. Trade receivables consist of a large number of customers including granting bodies. The Institute does not have a significant credit exposure to any single party or any group of counter parties having similar characteristics. The carrying amount of financial assets recorded in the financial statements represents the Institute's maximum exposure to credit risk.

(i) Liquidity risk management

Ultimate responsibility for liquidity risk management rests with the board of directors, who have built an appropriate risk management framework for the management of the Institute's short, medium and long-term funding and liquidity management. The Institute manages the liquidity risk by maintaining adequate cash reserves, and by continuously monitoring forecast and actual cash flows while matching the maturity profiles of financial assets. Given the current surplus cash assets, liquidity risk is minimal. The Institute does not have any interest bearing liabilities. The remaining contractual maturity for its non-interest-bearing financial liabilities is $10.176 million payable within 3 months of 31 December 2017 (2016: $5.503 million).

(j) Fair value

The carrying amount of the Institute's financial assets and financial liabilities recorded in the financial statements approximates their fair values. The fair value of financial assets with standard terms and conditions and traded on active liquid markets are determined with reference to quoted market prices.

(k) Interest rate risk

The following table details the Institute's exposure to interest rate risk as at 31 December 2017 and 31 December 2016.

	Average interest rate	Variable interest rate	Less than 1 year	1 to 5 years	More than 5 years	Non-Interest Bearing	TOTAL
31 December 2017		$'000	$'000	$'000	$'000	$'000	$'000
Financial assets							
Cash	0.33%	344,746	-	-	-	-	344,746
Tax assets		-	-	-	-	1,387	1,387
Sundry debtors		-	-	-	-	3,344	3,344
Prepayments		-	-	-	-	980	980
Accrued income		-	-	-	-	3,401	3,401
Shares		-	-	-	-	169,623	169,623
Floating rate securities	3.84%	-	-	18,821	43,187	-	62,008
Non listed shares		-	-	-	-	1,781	1,781
		344,746	**-**	**18,821**	**43,187**	**180,516**	**587,270**
Financial liabilities							
Trade payables		-	-	-	-	10,176	10,176
Other liabilities						310	310
Grants carried forward		-	-	-	-	23,343	23,343
		-	**-**	**-**	**-**	**33,829**	**33,829**

	Average interest rate	Variable interest rate	Less than 1 year	1 to 5 years	More than 5 years	Non-Interest Bearing	TOTAL
31 December 2016		$'000	$'000	$'000	$'000	$'000	$'000
Financial assets							
Cash	0.77%	32,849	-	-	-	-	32,849
Tax assets		-	-	-	-	2,735	2,735
Sundry debtors		-	-	-	-	3,163	3,163
Prepayments		-	-	-	-	515	515
Accrued income		-	-	-	-	1,296	1,296
Shares		-	-	-	-	161,340	161,340
Floating rate securities	4.04%	-	-	13,807	46,247	-	60,054
Non listed shares		-	-	-	-	338	338
		32,849	**-**	**13,807**	**46,247**	**169,387**	**262,290**
Financial liabilities							
Trade payables		-	-	-	-	5,503	5,503
Other liabilities		-	-	-	-	257	257
Grants carried forward		-	-	-	-	24,525	24,525
		-	**-**	**-**	**-**	**30,285**	**30,285**

24. Jointly controlled operations and assets

	2017	2016
Victorian Comprehensive Cancer Centre Limited (VCCC)	10.0%	10.0%

The Institute is a Member of the Victorian Comprehensive Cancer Centre Joint Venture (the VCCC) and the Institute retains joint control over the arrangement, which it has classified as a Joint Operation. The vision for the VCCC is to save lives through the integration of cancer research, education and patient care. Through innovation and collaboration, the VCCC will drive the next generation of improvements in prevention, detection and cancer treatment. This vision will further the objectives of the Institute. The VCCC is a not-for-profit organisation and has been recognised by the Australian Taxation Office as a Health Promotion Charity.

All Members hold an equal 1/10th share in the assets, liabilities, expenses and income of the VCCC. The members own the VCCC assets as tenants in common; and are severally responsible for the joint venture costs – in the same proportions as their interests.

Interests in the VCCC are not transferrable and forfeited on withdrawal from the joint venture. Distributions are not able to be paid to Members and excess property on winding up will be distributed to other charitable organisations with objects similar to those of the VCCC.

The principal place of business for the VCCC is Level 10, 305 Grattan Street, Melbourne, Victoria.

The Institute's policy is to value its proportionate member interest based on the most recent audited accounts of the VCCC. The last audited accounts received are dated 30 June 2017.

The Institute's interest in the above jointly controlled operations is detailed below.

	2017	2016
Assets	**$'000**	**$'000**
Current Assets		
Cash and cash equivalents	566	256
Trade and other receivables	3	8
Total current assets	**569**	**264**
Non-current Assets		
Investment in Cancer Therapeutics CRC	1	1
Property, plant and equipment	3	4
Total non-current assets	**4**	**5**
Share of total assets	**573**	**269**
Liabilities		
Current liabilities		
Trade and other payables	23	54
Employee benefits	8	42
Total current liabilities	**31**	**96**
Non-current liabilities		
Employee benefits	6	5
Total non-current liabilities	**6**	**5**
Share of total liabilities	**37**	**101**
Net Assets	**536**	**168**
Share of VCCC's net assets	**536**	**168**

25. Properties held for sale

During the 2016 year, the Institute was bequeathed a property from the deceased estate of a donor. It was bequeathed jointly, and in equal parts, to the Institute and the Peter MacCallum Cancer Foundation Ltd. Settlement of the sale was effected on 12 January 2017.

	2017	2016
Carrying value:	**$'000**	**$'000**
Contract price	-	220
Ownership share attributable to the Institute	-	50%
Fair value of property attributable to the Institute	**-**	**110**
Less costs to sell (50%)	-	(5)
	-	**105**

Governance statement:

The Walter and Eliza Hall Institute of Medical Research is a Public Company Limited by Guarantee. Ultimate responsibility for the governance of the Institute rests with the Board of Directors. This Governance Statement outlines how the Board meets that responsibility.

Achieving the Mission

The Board's primary role is to ensure that the Institute's activities are directed towards achieving its mission of 'Mastery of Disease through Discovery'. The Board must ensure that this mission is achieved in the most efficient and effective way.

Specific Responsibilities of the Board

The Board fulfils its primary role by:

- selecting, appointing, guiding and monitoring the performance of the Institute Director;
- formulating the Institute's strategic plan in conjunction with the Chief Executive and Senior Management;
- approving operating and capital budgets formulated by the Institute Director and Management;
- monitoring Management's progress in achieving the Strategic Plan;
- monitoring Management's adherence to operating and capital budgets;
- ensuring the integrity of internal control, risk management and management information systems;
- ensuring stakeholders receive regular reports, including financial reports;
- ensuring the Company complies with relevant legislation and regulations; and
- acting as an advocate for the Institute whenever and wherever possible.

Management's Responsibility

The Board has formally delegated responsibility for the Institute's day-to-day operations and administration to the Institute Director and Executive Management.

Board Oversight

The Board oversees and monitors Management's performance by:

- meeting at least four times during the year;
- receiving detailed financial and other reports from management at these meetings;
- receiving additional information and input from management when necessary; and
- assigning to the Audit and Risk, Commercialisation and Investment Committees of the Board responsibility to oversee particular aspects of the Institute's operations and administration.

Each Board Committee operates under a Charter approved by the Board. These Charters are reviewed annually and updated as necessary.

Board Members

All Board Members are Non-Executive Directors and receive no remuneration for their services. The Company's Constitution specifies:

- there must be no less than 12 and no more than 18 Directors;
- Directors (except those appointed by The University of Melbourne) are appointed for a maximum of four terms of three years each, after which Directors may be reappointed annually with the unanimous agreement of all other Board Members; and
- the President or Vice President may hold office for an additional period or periods not exceeding six years.

Appointments to the Board are made to ensure the Board has the right mix of skills, experience and expertise. One Board Member is appointed by the Trustees of the Institute and four Board Members are appointed by the Company's founding members, The University of Melbourne and The Royal Melbourne Hospital (Melbourne Health) (two members each) and up to a further 13 by the Board.

Board and Committee Members receive written advice of the terms and conditions of their appointment. Board and Committee Members' knowledge of the business is maintained by visits to the Institute's operations and management presentations.

The performance of individual Board and Committee Members and the Board and Board Committees is assessed annually.

Risk Management

The Board oversees the Institute's risk management system, which is designed to protect the Organisation's reputation and manage those risks that might preclude it from achieving its goals.

Management is responsible for establishing and implementing the risk management system, which assesses monitors and manages operational, financial reporting and compliance risks. The Audit and Risk Committee is responsible for monitoring the effectiveness of the risk management system between annual reviews.

Ethical Standards and Code of Conduct

Board Members, Senior Executives and staff are expected to comply with relevant laws and the codes of conduct of relevant professional bodies, and to act with integrity, compassion, fairness and honesty at all times when dealing with colleagues, and others who are stakeholders in our mission.

Involving Stakeholders

The Institute has many stakeholders, including our donors and benefactors, our staff, and students, the broader community, the government agencies who provide us funds and regulate our operations, and our suppliers.

We adopt a consultative approach in dealing with our stakeholders. We get involved in industry forums to ensure governments at all levels are aware of our concerns and our achievements and to remain abreast of industry developments.

Indemnification and Insurance

The Institute insures Directors (and the Company Secretary and Executives) against liabilities for costs and expenses incurred by them in defending any legal proceedings arising out of their conduct while acting in the capacity of Director (or Company Secretary or Executive) of the Company, other than conduct involving a wilful breach of duty in relation to the Company.

Directors' report

The Directors of the Walter and Eliza Hall Institute of Medical Research submit herewith the Annual Financial Report of the Company for the year ended 31 December 2017. In order to comply with the provisions of the Australian Charities and Not-for-Profits Commission Act 2012 the Directors report as follows:

Directors and Board Meetings

The names and particulars of the Directors of the Company during or since the end of the financial year and attendance at Board meetings in the year ended 31 December 2017 are:

		Joined Board	Meetings held while a Director	Meetings Attended
Christopher W Thomas AM *Chairman and President of the Institute* (elected February 2013)	BCom(Hons) MBA *Melb* FAICD	2001	5	5
Jane S Hemstritch *Vice President of the Institute* (elected July 2016)	BSc(Hons) FCA FAICD	2013	5	2
Robert H Wylie *Honorary Treasurer*	FCA FAICD	2014	5	5
Rufus ER Black (resigned 15 December 2017)	BA LLB(Hons) *Melb* DipTheol MPhil DPhil *Oxon*	2013	5	4
Malcolm W Broomhead	MBA BE(Civil) *Qld* FIE(Aus) FAusIMM FAIM MICE(UK) FAICD	2014	5	5
John Dyson	BSc *Monash* Grad Dip Fin Inv *SIA* MBA *RMIT*	2016	5	5
James McCluskey	BMedSci MBBS MD *UWA* FRACP FRCPA	2011	5	5
Marie McDonald	BSc (Hons) LLB (Hons) *Melbourne*	2016	5	5
Graham F Mitchell AO	RDA BVSc *Syd* FACVSc PhD *Melb* FTSE FAA	2007	5	5
Terence F Moran AC	BA(Hons) *Latrobe*	2013	5	4
Carolyn Viney	LLB/BA *Monash*	2016	5	4
Ingrid M Winship (resigned 3 November 2017)	MB ChB MD *Cape Town* FRACP	2007	4	4
Shitij Kapur	MBBS, PhD, FRCPC, FMedSci	May 2017	4	4
Christine Kilpatrick	MBBS, MBA, MD, FRACP, FRACMA, FAICD. FAHMS, DMedSci (Hons)	May 2017	4	3
Robert Doyle AC (resigned 5 February 2018)	BA BEd HonLLD	Oct 2017	1	1

The Audit and Risk Committee

The role of the Audit and Risk Committee is to assist the Board in fulfilling its statutory and fiduciary responsibilities with regard to accounting and financial reporting practices and internal control systems of the Company. The Committee met four times during the period under review.

Principal Activities

The Company's principal activity in the course of the financial year was medical research and there has been no significant change in that activity during the financial year.

Financial Results

The financial result from operations was a net surplus of $275,353,010 (2016: net surplus of $2,784,842). After allowing for gains from the sale of investments, other grants, donations and bequests, depreciation and amortisation the overall result for the period was a surplus of $278,517,585 (2016: surplus of $9,085,755). Tax is not applicable. The Company is Limited by Guarantee, has no share capital and declares no dividends.

Operations

A review of operations of the Company is included in the detailed scientific reports.

Environmental Regulations

The Institute aims to achieve a high standard in environmental matters. The Institute complies with the Environmental Protection Act in respect of its operations. Discharges to air and water are below specified levels of contaminants and solid waste is disposed of in an appropriate manner. Biomedical waste and sharps are disposed of through appropriately licensed contractors. The Directors have not received notification nor are they aware of any breaches of environmental laws by the Institute.

Appreciation

The Board wishes to extend its appreciation to the Members of the various Committees (Audit and Risk Committee, Appointments and Promotions Committee, Human Research Ethics Committee, Investment Committee, Commercialisation Advisory Committee, Advocacy and Support Committee and and the Financial Sustainability Committee) as well as the many other people including the Institute Director, staff, students, overseas visitors and honorary workers, who work so tirelessly to advance the Company's world-wide reputation for excellence in medical research. In particular, the Board wishes to acknowledge the 31 years of service Mr Peter Worcester has provided to the Investment Committee. A table of attendance at the various committees is listed below.

Committee attendance	Meetings held while a member	Meetings attended
Audit and Risk Committee		
Mr Robert Wylie (Chair)	4	4
Mr Malcolm Broomhead	4	3
Ms Jane Hemstritch	4	3
Commercialisation Advisory Committee		
Professor Graham Mitchell (Chair)	3	3
Dr Leigh Farrell	3	2
Dr Lisa Hennessey	3	2
Professor George Morstyn	3	0
Mr John Raff (resigned 27 November 2017)	3	0
Advocacy and Support Committee		
Mr John Dyson (Chair)	5	5
Ms Sally Bruce	5	0
Dr Paul Cooper	5	5
Mr Michael Daddo	5	1
Mr Hugh Hodges	5	5
Ms Caroline Johnston	5	3
Ms Andrea Lapidge	5	4
Mr John Marshall	5	3
Ms Catherine Robson	5	3
Remuneration and Nominations Committee		
Mr Christopher Thomas AM (Chair)	2	2
Associate Professor Rufus Black (resigned 15 December 2017)	2	2
Mr Terence Moran	2	2

Committee attendance	Meetings held while a member	Meetings attended
Human Research Ethics Committee		
Associate Professor Rufus Black (Chair) (resigned 15 December 2017)	5	5
Dr John Bonacci	5	5
Dr Vanessa Bryant	5	5
Rev Father Michael Elligate (Deputy Chair)	5	4
Mr David Freeman	5	4
Mrs Netta McArthur	5	4
Dr Rachel Nowak (resigned April 2017)	2	2
Dr Ken Pang (resigned July 2017)	3	1
Ms Moira Rayner	5	3
Professor Ingrid Winship (resigned October 2017)	4	4
Investment Committee		
Mr Robert Wylie (Chair)	4	4
Mr Malcom Broomhead	4	3
Mr Stephen Merlicek	4	4
Mr Stephen Milburn-Pyle	4	2
Mr Andrew Scott	4	3
Ms Fiona Trafford-Walker	4	3
Mr Peter Worcester (resigned 17 January 2018)	4	3

Auditors' independence declaration

The Auditors' independence declaration is included on page 92 of the financial report.

Other Matters

(a) During the financial year there was no significant change in the Company's state of affairs other than that referred to in the accounts or the notes thereto.

(b) There has not been any other matter or circumstance that has arisen since the end of the financial year, that has significantly affected, or may significantly affect the operations of the Company, the results of those operations, or the state of affairs of the Company in future financial years.

(c) Disclosure of information regarding likely developments in the operations of the Company in future years and the expected results of those operations is likely to result in unreasonable prejudice to the Company. Accordingly, this information has not been disclosed in this report.

(d) During the financial year the Company paid a premium in respect of a contract insuring the Directors and Officers of the Company against liability incurred as such a Director or Officer to the extent permitted by the Corporations Act 2001. The contract of insurance prohibits disclosure of the nature of the liability and the amount of the premium. The Company has not otherwise, during or since the financial year, indemnified or agreed to indemnify an Officer or Auditor of the Company or any related body corporate against a liability incurred as such an Officer or Auditor.

(e) The Company is a Company of the kind referred to in ASIC Corporations (Rounding in Financial/Directors' Reports) Instrument 2016/191 dated 24 March 2016, and in accordance with that Instrument amounts in the Directors' report and the financial report are rounded off to the nearest thousand dollars.

Signed in accordance with a resolution of the directors made pursuant to s.298(2) of the Corporations Act 2001.

On behalf of the directors

Christopher Thomas
President

Robert Wylie
Treasurer

Melbourne, 30 APRIL 2018

Directors' declaration

Directors' declaration - per section 60.15 of the Australian Charities and Not-for-profits Commission Regulation 2013.

The directors declare that in the directors' opinion:

(a) there are reasonable grounds to believe that the registered entity is able to pay all of its debts, as and when they become due and payable; and;

(b) the financial statements and notes satisfy the requirements of the Australian Charities and Not-for-profits Commission Act 2012.

Signed in accordance with subsection 60.15(2) of the Australian Charities and Not-for-profits Commission Regulation 2013.

Christopher Thomas
President

Robert Wylie
Treasurer

Melbourne, 30 APRIL 2018

Deloitte.

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30 April 2018

The Board of Directors
The Walter and Eliza Hall Institute of Medical Research
1G Royal Parade
PARKVILLE VIC 3052

Dear Board Members

The Walter and Eliza Hall Institute of Medical Research

In accordance with the Subdivision 60-C of the *Australian Charities and Not-for profits Commission Act 2012*, I am pleased to provide the following declaration of independence to the directors of The Walter and Eliza Hall Institute of Medical Research.

As lead audit partner for the audit of the financial statements of The Walter and Eliza Hall Institute of Medical Research for the year ended 31 December 2017, I declare that to the best of my knowledge and belief, there have been no contraventions of:

(i) the auditor independence requirements as set out in the *Australian Charities and Not-for profits Commission Act 2012* in relation to the audit; and

(ii) any applicable code of professional conduct in relation to the audit.

Yours sincerely

Deloitte Touche Tohmatsu

DELOITTE TOUCHE TOHMATSU

Anneke Du Toit
Partner
Chartered Accountants

Deloitte.

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Independent Auditor's Report to the Members of The Walter and Eliza Hall Institute of Medical Research

Opinion

We have audited the financial report of the Walter and Eliza Hall Institute of Medical Research ("WEHI"), which comprises the statement of financial position as at 31 December 2017, the statement of comprehensive income, statement of changes in equity and statement of cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies, and the declaration by the Directors.

In our opinion, the accompanying financial report presents fairly, in all material respects, the Entity's financial position as at 31 December 2017, and of its financial performance and its cash flows for the year then ended in accordance with Australian Accounting Standards and Division 60 of the *Australian Charities and Not-for-profits Commission Act 2012* (the ACNC Act).

Basis for Opinion

We conducted our audit in accordance with Australian Auditing Standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Report* section of our report. We are independent of the Entity in accordance with the auditor independence requirements of the ACNC Act and 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 our audit of the financial report in Australia. We have also fulfilled our other ethical responsibilities in accordance with the Code.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other Information

The Directors are responsible for the other information. The other information obtained at the date of this auditor's report comprises Directors' Report, Statistical summary for the year ended 31 December 2017 and Capital Funds included in the annual report for the year ended 31 December 2017, but does not include the financial report and our auditor's report thereon.

Our opinion on the financial report does not cover the other information and we do not and will not express any form of assurance conclusion thereon.

In connection with our audit of the financial report, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial report or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed on the other information that we obtained prior to the date of this auditor's report, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Those Charged with Governance's for the Financial Report

Those Charged with Governance are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards – Reduced Disclosure Regime and the ACNC Act and for such internal control as Those Charged with Governance determine is necessary to enable the preparation and fair presentation of the financial report and is free from material misstatement, whether due to fraud or error.

In preparing the financial report, Those Charged with Governance are responsible for assessing the Entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless Those Charged with Governance either intend to liquidate the Entity or to cease operations, or have no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Financial Report

Our 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 our 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 the 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, we exercise professional judgement and maintain professional scepticism throughout the audit. We 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 our 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 the purpose of expressing an opinion on the effectiveness of the Entity's internal control.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Directors.

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- Conclude on the appropriateness of the Directors' 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 Entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial report or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Entity 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.

We communicate with Those Charged with Governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Deloitte Touche Tohmatsu

DELOITTE TOUCHE TOHMATSU

Anneke Du Toit
Partner
Chartered Accountants
Melbourne, 30 April 2018

Statistical summary for the year ended 31 December 2017

	2017	2016	2015	6 months to 31 December 2014	12 months to 30 June 2014
	$'000s	$'000s	$'000s	$'000s	$'000s
Revenue					
Australian Government	45,163	51,079	48,492	25,569	51,512
Victorian Government	12,739	7,753	7,419	3,078	6,936
Foreign governments	243	1	495	47	506
Government revenue	**58,145**	**58,833**	**56,406**	**28,694**	**58,954**
Industrial grants and contracts	4,044	3,227	4,691	1,058	1,696
Philanthropic grants and fellowships – Australia	7,444	8,804	8,062	4,659	9,024
Philanthropic grants and fellowships – international	6,468	5,805	7,386	4,056	6,355
Investment income	12,118	13,463	13,172	7,074	12,925
Royalty income	11,059	12,328	2,262	4,727	3,119
General revenue	7,560	5,746	4,430	1,077	3,369
Donations and bequests	9,327	8,816	7,297	4,126	6,678
Royalty monetisation revenue	331,082	-	-	-	-
Non-government revenue	**389,102**	**58,190**	**47,300**	**26,773**	**43,166**
Total revenue	**447,247**	**117,021**	**103,706**	**55,467**	**102,120**
Expenditure					
Staff costs	85,944	80,652	76,570	38,544	75,027
Laboratory operating costs	20,756	19,025	18,327	9,326	17,841
Laboratory equipment	4,047	3,610	2,284	1,105	2,538
Building operations	4,849	4,673	4,712	2,424	5,171
Administration	3,718	5,258	2,501	1,451	1,985
Fundraising	487	387	219	106	-
Business development	997	747	825	390	849
Doubtful debts expense	(47)	(115)	-	201	-
Royalty monetisation costs	51,143	-	-	-	-
Total expenditure	**171,894**	**114,237**	**105,438**	**53,547**	**103,411**
Operating result	**275,353**	**2,785**	**(1,732)**	**1,920**	**(1,291)**
Other income					
Profit and loss on sale of long-term assets	5,002	8,671	9,512	2,170	5,324
Donations and bequests capitalised to Permanent Funds	2,877	5,162	719	137	1,581
Grants and donations for capital works	4,330	1,733	6,071	870	3,204
Total other income	**12,209**	**15,566**	**16,302**	**3,177**	**10,109**
Other expenses					
Loss on impairment write down of long-term investments	-	(709)	(4,808)	(391)	-
Depreciation and amortisation	(9,044)	(8,556)	(8,512)	(4,486)	(8,671)
Total other expenses	**(9,044)**	**(9,265)**	**(13,320)**	**(4,877)**	**(8,671)**
Net surplus	**278,518**	**9,086**	**1,250**	**220**	**147**
Capital funds					
Permanent invested capital funds	185,610	181,162	168,392	159,027	157,026
General funds	378,204	114,306	130,122	143,126	150,132
Royalty fund	44,410	34,981	26,169	24,387	19,994
Leadership fund	24,562	23,581	21,682	19,724	18,975
Discovery fund	4,545	2,682	2,362	2,109	2,030
Centenary fund	-	2,101	1,000	104	100
Investment revaluation reserve	40,853	34,393	35,305	47,755	46,763
Total funds	**678,184**	**393,206**	**385,032**	**396,232**	**395,020**
Capital expenditure					
Property, plant and equipment	**16,078**	**9,960**	**5,062**	**1,484**	**3,937**
Staff numbers: (equivalent full-time)					
Scientific research staff:					
– Senior faculty	78	78	79	77	78
– Postdoctoral scientists	183	188	176	190	197
– Visiting scientists	48	39	23	12	14
–Other laboratory research staff	241	252	238	269	265
Supporting staff:					
– Other support services	180	162	146	144	135
Total staff and visiting scientists	**730**	**719**	**662**	**692**	**689**
Students	180	173	169	159	175
Papers published	**419**	**429**	**410**	**167**	**381**

Capital Funds

Permanent Named Capital Funds

The following is a complete listing of all permanent funds held and invested by the Institute at 31 December, 2017.

*New donations of capital received in current financial period.

	2017 $
Adair John Bequest (ex DW)	394,911
Adair John Bequest (ex MF)	74,980
Alexander R Estate	157,465
Allison-Levick J & H	88,385
Alston Peter and Julie Florence Fellowship Fund	1,374,110
Amey AM Estate	38,024
Anderson KA Estate	282,647
Anderson NM Estate	17,128
Angus Dorothy Irene Estate	278,145
Anonymous	356,030
Anonymous	3,170,768
Anonymous – Tasmania	60,816
Anonymous – Victoria	7,324
Anonymous – Victoria	197,109
Arnel Florence Janet Maude Estate	57,521
Arter Myra G Estate	88,435
Ashford Ivy A Estate	35,008
Attwell Samuel E Estate	68,493
Atyeo George & Isobel Fund	50,316
Baker Alice Lillian Estate	83,375
Ballantyne JW Estate	797,305
Barfield WG Estate	54,123
*Barry Joan Elaine Memorial Fund	33,318
Bartlett Mary V Estate	38,353
*Bates Tim Memorial Diabetes Research Fund	173,548
Charles L Bartholomew Estate	159,144
Bauer Dr Franz Estate	65,505
Bell Valerie Amy	92,791
Benjamin EG Estate	61,386
Bennett LM Estate	38,824
Berry Ruby C Estate	163,805
Biderman Cyla Estate	78,183
Blain BE Estate	125,191
Bland RT Estate	376,489
Bock Lindsay William Estate	33,142
Boothman Alva Estate	769,473
Borrett M A Estate	598,055
Bran EG Estate	217,682
Brennan EM Estate	67,951
The Ruby Bryan Memorial Fund	742,400
Brittain W & VI Mem Fund	80,075
Brockhoff Nyon Trust	251,468
Brough AV Estate	86,505
Brown Isabelle A Estate	90,100
Bruce RH Estate	39,516
Buckland William Foundation Fund	231,822
Buckman Olive Estate	27,463
Bult C G Estate	500,726
Brumloop LAA Estate	86,252
Burley Stanley Estate	70,244
Burnet Sir Macfarlane Estate	126,558
Burns JC Estate	185,334
Cahill JL Estate	25,663
Callaway LJ Estate	49,141
Cambridge Beresford Estate	203,546
Carlin Freda Evelyn Estate	100,684
Carling DM Estate	179,877
Carlson Catherine Estate	90,311
Carlson Elizabeth F Estate	102,071
Carty LEW Charitable Fund	43,411
Cato EA Estate	890,614
Cato MC Estate	723,891
Chapman Debbie Memorial Fund	13,164
Chatfield SL Estate	122,184
Claridge John PG Estate	36,419
Clark Lindesay Fund	988,255
Cockburn Clarice BP Estate	27,385
Cole DE Estate	785,081
Coles GO Estate	38,185
Collie Barbara Estate	152,040
Collie Betty Rae	213,190
Collie George Estate	2,385,653
Colliver Len Estate	56,195
Connolly Grace C Estate	129,401
Cormack Margaret Mary	96,537
Cory Joy & Desmond Cancer Research Fund	130,734
Coultass Hylda M Estate	129,718
Courtney Gwendoline Vera Estate	277,665
Coutts Dr ELA Estate	130,237
Coutts IBM Estate	27,617
*Craven DA Memorial Fund	1,257,382
JE Craven & MA Shearer Estates	49,350,773
Crawford Duncan Estate	16,985
Criswick R M Estate	517,966
Critchlow Ronald P Estate	303,087
Crowley MM Estate	211,789
Cubbins SG Estate	90,170
Cummings ED Estate	160,542
Cutter BE Estate	16,686
Darbyshire EJ (Ted) Estate	349,193
Davey Dorothy Estate	308,967
Davidson BI Estate	26,219
Davidson EE Estate	29,758
Davis FLG Estate	59,496
Dawson Anne Marie Estate	7,954
Del Cott RAM Estate	262,277
Deryk SD Estate	70,936
Sir Harold Dew and Family Estate	845,642
Dick MRK (Ray) Estate	220,097
Dickie Phoebe Estate	45,102
Dimsey WE Estate	226,994
Dobbie Myrtle M Estate	41,428
Dodgshun GM Estate	164,662
Dossetor Catherine L Estate	35,822
Dowie S Estate	23,256
Drakensberg Trust	2,500,340
Drury Evelyn Ann Fund	122,283
Duncan PH Estate	98,282
East James Douglas Estate	187,066
Edwards Allen Richard Estate	196,744
Edwards HHW Estate	250,686
Eisner KR	96,806
Ellis GM Estate	3,800,902
Emery Harriet Anne Estate	21,579
Eva Michael Ross Estate	4,525,051
Facey Mary Bethune Estate	16,533
Fagg Maude V Estate	102,858
Fields Ernest Estate	289,161
Findlay Winifred Gertrude Estate	144,442
Fitzgerald Sheila Mary Estate	44,230
Ford Ada Joyce Estate	20,271
Fraser K Estate	2,095,058
Galbraith DA & DV Estate	114,227
Gerdts Sheila Lesley G Estate	68,589
Gibb Geo & Bennett Wm A	423,749
Gilbert Augusta Estate	382,908
Gilder CH Estate	16,886
Gillon AM Estate	3,193,778
Girdwood J Estate	251,682
Goldman Sachs JB Were Foundation	776,805
Gordon H & T Estate	112,756
Graves GC Estate	27,936
Gray Bessie Mavis Fund	26,537
Gray Clara Estate	76,219
Greig Harry Douglas Estate	532,444
Grubb Walter Joseph Estate	39,400
Guest Doris Rose Estate	16,572
Hackett Dorothy Estate	6,822
Hadfield RCS Estate	120,200
Hadley AN Estate	1,199,205
Hamilton M Estate	47,985

Harrap FM Estate	142,014
Harrap LM Estate	30,623
Harris Alan Scholarship Fund	95,218
Harris John D & Lyla Foundation	900,914
Hartlett K Estate	1,035,306
Haydon Michael JM Memorial Fund	63,344
Hearse JD	1,259,714
Hemphill Olive May Estate	69,762
Henderson AN Estate	26,601
Henderson Joan Estate	135,958
Henry MA Estate	668,522
Heron Thelma Hope Estate	99,230
Highton GAN Estate	570,313
Hill Ramon Bruce Estate	160,581
Hind Ruby F Estate	34,641
Hocking Helen Estate	379,043
Holmes EM Estate	84,764
Hope Irene Estate	446,139
Hooper Nancy Hilda	117,805
Hosier MM Estate	159,027
Hurry M Estate	32,179
Inglis Dulcie M Estate	119,074
Ironside WH Estate	70,244
Jackson Catherine M Estate	202,847
Johnson Daphne Adele Estate	8,270
Johnson Ethel Grace Estate	48,104
Johnson Sydney Robert Estate	54,880
Johnstone Reginald Ben Estate	14,647
Judd Anita Estate	63,311
Kayler-Thomson Marion Estate	54,821
Keating L Estate	1,428,144
Keats LCA Estate	1,350,437
Kellock TH Estate	1,903,145
Kendall Nanyce Douglas	49,657
Kerr HM Estate	114,299
King DM Estate	43,581
Knight FF Estate	31,819
Lang John Murray Estate	782,222
*Lanigan Annie Maria (Nance) & Janet Mary Fund	32,487
Lanteri Gwen Estate	1,640,956
Larard DV Estate	13,526
Leckie Winifred Estate	227,043
Lilford VM Estate	500,697
Lins RD Estate	28,097
Little Mabel B Estate	68,541
Lyddon Pauline M Estate	1,260,209
Lyell Alexia Bequest	456,314
MacAskill WG & I	28,097
Mace Nina May Estate	303,826
MacDonald Elsie May Estate	189,565
Macindoe Jock & Diana Fund	42,146
MacIntosh Elizabeth H Estate	25,312
Mackie-Smith CM Estate	385,009
Macleay The Lillian & Kenneth Bequest	441,213
MacNamara Jean Fund	1,037
Mahoney Florence Cancer Fund	177,552
Malcolm Phyllis Elizabeth Estate	284,522
Maloney Kathleen Margaret Estate	23,418
Mann David Memorial Research Fund	48,664
Mansfield Trevor Geoffrey Estate	10,459
Marguccio R Estate	14,049
Mariner Barry Leonard Estate	64,914
McArthur Nellie M Estate	111,748
McCooke Miss MH Estate	352,924
McDonald Charles Thomas	19,153
McDougall Phyllis Mable Estate	132,794
McGhee ME Estate	76,496
McGregor Amy VK Estate	129,361
McGregor Elvira Ruth Estate	23,837
McGregor KB Estate	187,028
Mckay C N Fund	276,980
McKinnon Sheila May Estate	47,163
McLean Ada Myee Dutton Estate	556,317
McLennan B Estate	100,470
McNab M Estate	25,380
McNeill Sir James Fund	21,851
McRorie Ruby A Estate	82,160
Menagh Thelma Marie Estate	19,118
Miller Lorna May Estate	916,877
Miller MA Estate	65,755
Miller Violet Isabella Estate	76,521
Minney DW & NR Fund	14,049
Mitchell, Bettye Victoria Fund	4,610,397
Mitchell Doris Georgina Mildred	70,244
Mitchell G Fund	54,449
Moden FHW Estate	135,407
Moody E Vaughan Estate	1,342,123
Moon Ida Alice Estate	53,047
Mooney Carmel Mary, Estate of	176,560
Moore Phyllis Estate	14,049
Morgan DM Estate	414,289
Morris Foundation of Medical Research	177,570
Moss EE Estate	271,014
Muller FG Estate	20,059
Murray Alan Ambrose Estate	36,114
Murray Gwendoline Mary Fund	1,252,754
Must Mary Kathleen Bequest	1,097,913
Myer Dame Merlyn Estate	15,133
Myer Pam Sallmann Foundation	30,637
Nevill Melanie Joy	84,453
Newton Evelyn	19,631
Newton EM Estate	19,082
Nicholas Harold George Estate	335,020
Norins Leslie Fund	286,163
Norton M Estate	888,773
Nossal Sir Gustav Fund	329,472
Nottingham SG Estate	36,335
Palmer DE Estate	27,422
Palmer Ethel Fund	330,197
Parker Barbara Memorial Fund	75,263
Parker Mabel V Estate	84,787
Parsons Kathleen FB Estate	42,926
Patten Ralph & Etty Bequest	319,363
Patterson Gerard A Estate	20,071
Paulin Leukaemia Fund	231,598
Paulin SC Estate	29,086
Payne Henry and Charlotte Fund	1,000,978
Peterson Vera Estate	599,987
Petley Francis Estate	159,383
Pierce John Lindsay Estate	1,280,013
Pietsch Dr CH Fund	213,583
Porter Florence JA Estate	137,246
Prater Mabel Edward	14,567
Pritchard DG Estate	36,059
Pyke MA Estate	16,858
Qualtrough Research Fund	2,833,569
Rae Olive Estate	1,173,152
Reeves Jessie Estate	65,875
Reid John T Charitable Trusts	7,656,928
Reiser Erwin Estate	28,097
Richardson DLK Estate	89,840
Ricker EM Fund	80,835
Roberts JI Charitable Fund	8,570
Robertson AT Estate	14,049
Rose Norma J Estate	14,202
Ruppel FE Estate	162,852
Salemann CW Estate	14,049
Sallmann L & E Memorial Fund	27,422
Santos TS Estate	909,825
Schack Elsie Edith Estate	132,946
Scott Annie May Estate	173,281
Sharp II Estate	22,085
Shaw Eileen Coryn Estate	24,601
Shelton Edgar Estate	862,309
Sidwell OB Estate	2,026,550
Skea Lyndal and Jean Leukaemia Fund	1,069,027
Skinner Phyllis Maye Estate	89,058
Smith Elsie Violet Estate	17,947
Smorgon Robert & Jack Family Foundation	395,471
Snow Freda Estate	63,892
Spence Frank Meldrum	36,419
Spencer Stanley L Estate	19,424
Stanbrough AE Estate	111,992

Stephens L Estate	116,530
Stevens SA Estate	132,744
Stevenson Dame Hilda Estate	95,062
*Stewardson Family Trust	145,697
Stewart Jean Elma	89,508
Swingler Maxwell & Mary Bequests	2,688,624
Sydserff Charles SB Estate	17,673
Syme David Farnell Estate	1,026,690
Talbot P Estate	438,609
Taws M Estate	140,487
Taws GE Arthritis Fund	26,537
Taylor Sarah McQuillan Estate	65,390
Thomas JC Estate	323,409
Thompson O Estate	31,118
Thorpe Doris EB	95,936
Tink RM Estate	326,180
Tinkler VF Estate	62,990
Tomasetti John T Estate	446,452
Thompsom LW Estate	2,323,068
Tressider Edith Kathleen Estate	576,307
Trezise KW Estate	20,246
Tropical Diseases Fund	98,618
Turnbull JG Estate	82,574
Van Leeuwen GH Estate	499,119
Vincent-Smith IG Fund	201,448
Vogel Herta & FB Estate	14,202
Walker CM Estate	231,480
Walker Dorothy Hope Estate	2,473,971
Wallace Nancy Jeanie Estate	219,311
Walsh Dr William Butler Memorial Fund	905,184
Walter Ailsa Amy Mary Estate	171,326
Warnock EMC nee Riddle Estate	1,794,119
Watson MR Estate	16,077
Waxman Elizabeth H Estate	77,425
Wedge Erica Estate	355,124
Webb NJ Estate	285,171
Weeks Thelma Estate	14,567
Wekwerth Hilda Frances Estate	34,823
West John James Estate	107,720
Westcott Ita E Estate	22,616
White Morris G Estate	45,167
Wicks LR Estate	14,049
Williams AM Estate	93,048
Williams Irene E Estate	337,873
Wilson DE Estate	87,910
Wilson MML Estate	98,926
Wilson NF Estate	14,049
Wilson V M (Sunny) Estate	144,902
Wolstonecroft WW Estate	40,116
Wright Lynette Oreti Estate	203,517
Zillman Dudley V Estate	56,467

Fellowship and Scholarship Funds

Farrant Patricia & John Scholarship Fund	208,644
JHA Munro Foundation	966,826
*Macphee Avis Permanent Fund	52,596
Mathison G C Research Scholarship	191,908
*Metcalf Donald Scholarship Fund	858,488
Moffatt Edith Scholarship Fund	1,990,627

PhD Scholarship Funds

Carty EM Fund	404,409
Mackay Dr Ian Fund	306,258
Pearl Paddy Fund	1,409,244
*Speedy Pauline Scholarship Fund	500,000
Syme Colin Fund	1,965,872
Wilson Ed Memorial Fund	1,760,746

Other Funds

Anonymous Seminar Award	19,416
Balderstone Award	42,706
Gideon Goldstein Fund	1,405,869
*Speedy Pauline Innovation Grant Fund	700,000

The following Estates in which the Institute had an interest, were managed during the year by Trustees. (Income received by the Institute in the financial period is treated similarly to donations and bequests):

The Baldy Trust Fund

CH Boden Memorial Trust

John Frederick Bransden Memorial Fund

Frank Broadhurst Estate

Thomas, Annie & Doris Burgess Charity Trust

Miss EM Drummond Estate

Frederick and Winifred Grassick Memorial Fund

Estate of Maxwell Gardiner Helpman

Estate of Shelia Mary Helpman

The Mackie Bequest

Irene and Ronald MacDonald Foundation

Albert H Maggs Charitable Trust

Mrs AM Reilly

Miss ML Reilly

The Stang Bequest

Emily Vera Winder Estate

Florence Mary Young Charitable Trust

Hazel and Pip Appel Fund

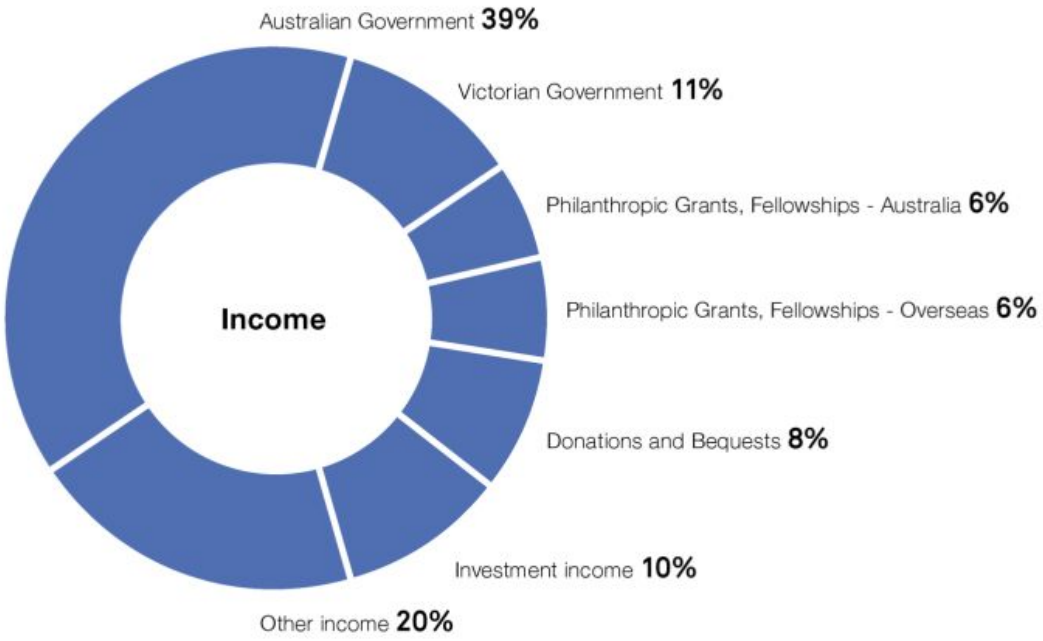
Leadership Fund

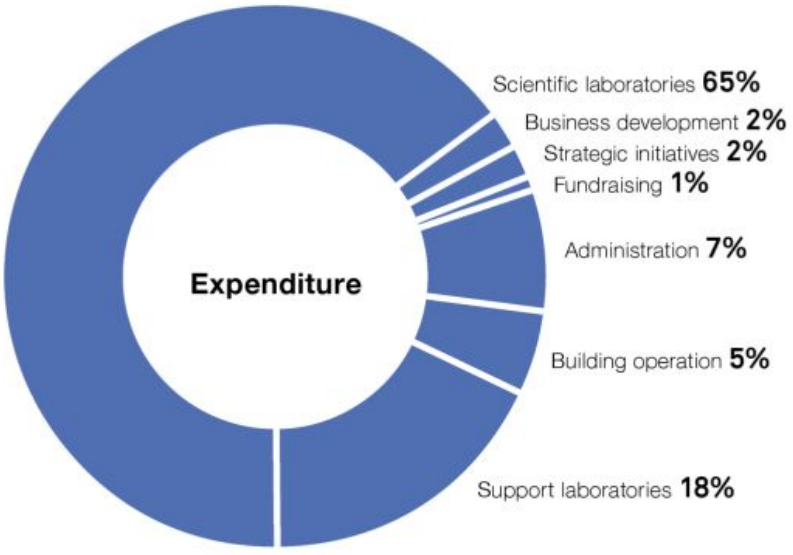
The Leadership Fund was established in honour of Professors Gustav Nossal, Donald Metcalf, Jacques Miller and Suzanne Cory to provide named Fellowships to nurture the development of outstanding young scientists with the potential to be future leaders of biomedical research. The Cory Fellowship is currently held by Misty Jenkins until 2021.

The Leadership Fund at 31 December 2017 included the following permanent funds ($10,000 and over):

Sir Harold Dew and Family Estate	6,745,420
Chugai Pharmaceutical Co Ltd	1,404,039
The Ian Potter Foundation	1,404,039
L M Archibald Estate	936,027
Albert H Maggs Charitable Trust	915,579
Helen Macpherson Smith Trust	561,615
Anonymous	468,013
Anonymous	468,013
E Vaughan Moody Estate	468,013
The Broken Hill Proprietary Company Limited	468,013
J B Were & Son Charitable Fund	468,013
Eunice L Lambert Estate	460,389
Betty Eunice Stephens Estate	315,205
National Australia Bank	280,808
Victor Smorgon Charitable Fund	205,925
The Sidney Myer Fund	168,486
Leslie D W Stewart Estate	137,750
Joe White Bequest	127,300
Krongold Foundation Pty Limited	93,603
Professor Sir Gustav Nossal	93,603
The Scobie and Claire MacKinnon Trust	93,603
The R & J Law-Smith Gift	56,162
National Mutual Holdings Limited	56,162
Pacific Dunlop Ltd	56,162
Sheila R White Estate	55,376
Coles Myer Ltd	46,800
James Kirby Foundation	46,800
Arthur Andersen & Co Foundation	37,439
Arthur Robinson & Hedderwicks	37,439
H B Kay Estate	18,721
Stephelle Pty Ltd	18,721
C M Walter	18,721

The period at a glance (net monetisation)





The Year In Brief	2017	2016
Income for operations	447,247	117,021
Expenditure in operations	171,894	114,237
Net surplus from operations	275,353	2,785
Number of staff and visiting scientists	730	719
Number of postgraduate students	180	173
Total staff and students (EFT)s	910	892

Walter+Eliza Hall
Institute of Medical Research

DISCOVERIES FOR HUMANITY

ANNUAL REPORT
2017
Publications

CANCER
IMMUNE DISORDERS
INFECTIOUS DISEASE

Publications

BIO Bioinformatics division
CBD ACRF Chemical Biology division
CHD Cancer and Haematology division
CSCD Cell Signalling and Cell Death division
DCD Development and Cancer division
IMM Immunology division
INF Infection and Immunity division
INFL Inflammation division
MGC Molecular Genetics of Cancer division
MIMM Molecular Immunology division
MMD Molecular Medicine division
PHI Population Health and Immunity division
SBD Structural Biology division
SBPM Systems Biology and Personalised Medicine division
SCC Stem Cells and Cancer division

Number of Publications
Primary: 313
Review: 97
Book/Chapter: 14
Total: 424

Primary

1. Adema CM, Hillier LW, Jones CS, Loker ES, Knight M, Minx P, Oliveira G, Raghavan N, Shedlock A, do Amaral LR, Arican-Goktas HD, Assis JG, Baba EH, Baron OL, Bayne CJ, Bickham-Wright U, Biggar KK, Blouin M, Bonning BC, Botka C, Bridger JM, Buckley KM, Buddenborg SK, Lima Caldeira R, Carleton J, Carvalho OS, Castillo MG, Chalmers IW, Christensens M, Clifton S, Cosseau C, Coustau C, Cripps RM, Cuesta-Astroz Y, Cummins SF, di Stefano L, Dinguirard N, Duval D, Emrich S, Feschotte C, Feyereisen R, FitzGerald P, Fronick C, Fulton L, Galinier R, Gava SG, Geusz M, Geyer KK, Giraldo-Calderon GI, de Souza Gomes M, Gordy MA, Gourbal B, Grunau C, Hanington PC, Hoffmann KF, Hughes D, Humphries J, Jackson DJ, Jannotti-Passos LK, de Jesus Jeremias W, Jobling S, Kamel B, Kapusta A, Kaur S, Koene JM, Kohn AB, Lawson D, Lawton SP, Liang D, Limpanont Y, Liu S, Lockyer AE, Lovato TL, Ludolf F, Magrini V, McManus DP, Medina M, Misra M, Mitta G, Mkoji GM, Montague MJ, Montelongo C, Moroz LL, Munoz-Torres MC, Niazi U, Noble LR, Oliveira FS, Pais FS, Papenfuss AT, Peace R, Pena JJ, Pila EA, Quelais T, Raney BJ, Rast JP, Rollinson D, Rosse IC, Rotgans B, Routledge EJ, Ryan KM, Scholte LLS, Storey KB, Swain M, Tennessen JA, Tomlinson C, Trujillo DL, Volpi EV, Walker AJ, Wang T, Wannaporn I, Warren WC, Wu XJ, Yoshino TP, Yusuf M, Zhang SM, Zhao M, Wilson RK. Whole genome analysis of a schistosomiasis-transmitting freshwater snail. *Nature Communications.* 2017 8:15451. **BIO**
2. Advani G, Lim YC, Catimel B, Lio DSS, Ng NLY, Chueh AC, Tran M, Anasir MI, Verkade H, Zhu HJ, Turk BE, Smithgall TE, Ang CS, Griffin M, Cheng HC. Csk-homologous kinase (Chk) is an efficient inhibitor of Src-family kinases but a poor catalyst of phosphorylation of their C-terminal regulatory tyrosine. *Cell Communication and Signaling* 2017 15(1):29. **SBPM**
3. Agthe M, Garbers Y, Putoczki T, Garbers C. Interleukin-11 classic but not trans-signaling is essential for fertility in mice. *Placenta.* 2017 57:13-16. **INFL**
4. Alhamdoosh M, Law CW, Tian L, Sheridan JM, Ng M, Ritchie ME. Easy and efficient ensemble gene set testing with EGSEA. *F1000 Research.* 2017 6:2010. **MGC MMD**
5. Ameratunga R, Koopmans W, Woon ST, Leung E, Lehnert K, Slade CA, Tempany JC, Enders A, Steele R, Browett P, Hodgkin PD, Bryant VL. Epistatic interactions between mutations of TACI (TNFRSF13B) and TCF3 result in a severe primary immunodeficiency disorder and systemic lupus erythematosus. *Clinical & Translational Immunology.* 2017 6(10):e159. **IMM**
6. Anderson MA, Tam C, Lew TE, Juneja S, Juneja M, Westerman D, Wall M, Lade S, Gorelik A, Huang DCS, Seymour JF, Roberts AW. Clinico-pathological features and outcomes of progression of CLL on the BCL2 inhibitor venetoclax. *Blood.* 2017 129(25):3362-3370. **CHD**
7. Anderton H, Rickard JA, Varigos GA, Lalaoui N, Silke J. Inhibitor of apoptosis proteins (IAPs) limit RIPK1-mediated skin inflammation. *Journal of Investigative Dermatology.* 2017 137(11):2371-2379. **CSCD**
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Cover image

The cover shows three awardees in the Walter and Eliza Hall Institute's 2017 Art of Science competition, from left: Ms Ashleigh Kropp, Dr Stephen Mieruszynski and Ms Casey Ah-Cann. They are shown with Ms Kropp's Art of Science image, *Protein smoke*, which depicts the protein DCLK1. This protein is of particular interest for its role in cell division, too much of which can lead to cancer.

Using modelling software, Ms Kropp was able to construct and observe a blueprint for DCLK1 in 3D. Coloured to evoke rising plumes of mauve and pink smoke, this image is a snapshot of the model, showing all the atoms and bonds that make up the structure of DCLK1.

Being able to visualise a protein's shape and surface area gives researchers vital clues about how different proteins interact within the body and what goes wrong with these interactions in cancer. Such interactions are significant because too little or too much can offset the balance that needs to be maintained for good health.

The 2017 Art of Science finalist images and movies can be viewed at www.wehi.edu.au/artofscience.

Below: Ms Ashleigh Kropp (centre) is a PhD student studying proteins such as DCLK1 that are involved in the development of cancer. She is supervised by Dr Onisha Patel (left) and Dr Isabelle Lucet.