



ANNUAL REPORT 2019

Raine Medical Research Foundation

"It is true to say that, if not today or even tomorrow, certainly at some time in the future, each and every West Australian will benefit in some way from the generous legacy Mary Raine left to this State."

Meg Sangster, The Mary Raine Story

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OUR PARTNERS AND DONORS

Our thanks go to our generous donors and partners who have contributed to the outstanding research programs supported in 2019. This ongoing support has enabled the expansion of our programs and increased funding for leading research in WA.



Supporting Research into Child Health



Charter Hall



THE UNIVERSITY OF
WESTERN
AUSTRALIA

COCKELL BEQUEST



HEALY
MEDICAL RESEARCH FOUNDATION



THE JOHN & CAROL STEWART
FAMILY FOUNDATION



FORREST
RESEARCH
FOUNDATION



Government of Western Australia
Department of Health

RIGBY FAMILY
BEQUEST

STRACHAN BEQUEST

ABOUT THE FOUNDATION



The Raine Medical Research Foundation is an outstanding example of what can be achieved when a generous act of philanthropy is directed toward improving the lives of others. This was Mary Raine’s wish when in 1957 she made the decision to leave her wealth to

The University of Western Australia for the establishment of a medical research foundation.

Mary Raine’s story is inspirational. Her humble beginnings were an unlikely launching pad for the success and wealth she came to achieve in her lifetime. Through hard work and the application of business acumen rarely seen in a woman in the early years of the 20th century, Mary Raine went on to build a large real estate empire.

She was a visionary and saw the establishment of the Raine Foundation as a unique opportunity for her life’s work to live on in perpetuity – to grow and develop into something more important and more valuable than the business success and wealth that she had personally achieved. She did this by giving scientists and clinicians the means and opportunity to embark on medical research and to seek answers to questions that were not known in her lifetime.

Today, the Raine Foundation has allocated \$50mill towards medical research in support of numerous competitive funding programs including two Centres of Excellence, project grants, fellowships, scholarships, collaboration awards, visiting professor awards, and publication prizes. The Raine Foundation has partnered with many generous donors and organisations in continued efforts to retain and provide ongoing support for future generations of scientists in Western Australia, whose health discoveries will benefit all in the community.

(Top Left: Mary Raine in 1957 (photo courtesy The West Australian).

OUR MISSION

Mary Raine was explicit in her wishes as documented in the Raine Foundation Deed of Trust (1957) that: “The net income of the Fund shall be applied towards seeking, diagnosing and investigating the nature, origin and causes of diseases in human beings, with the initial emphasis on arteriosclerosis and allied diseases, and the prevention, cure, alleviation and combating of such diseases.”

OUR CORE VALUES



EXCELLENCE We strive to ensure research excellence by supporting outstanding medical research scientists and programs that will improve health outcomes.



INTEGRITY We continuously develop and uphold robust, transparent, and equitable grant review processes to ensure that only the very best research is supported.



COLLABORATION We facilitate collaborative activities that allow our researchers to work and learn from internationally recognised research leaders.



GROWTH We support the early careers of our future research leaders, to ensure the growth of a strong research community that strives for real-world impact.

CHAIR’S REPORT

It is with great pleasure that I present to you the 2019 Annual Report of the Raine Medical Research Foundation, including the activities of the Healy Medical Research Foundation.

FUNDING DISTRIBUTIONS

It has been another strong year of medical research support for the Raine Foundation. The Foundation distributed \$2,410,058 towards WA medical research, including 48 ongoing projects that resulted in 56 research articles being published in 2019. We were honoured to welcome distinguished scientists from the UK, USA, Germany, Melbourne and Sydney for visits with our researchers, as part of the Raine Visiting Professors program. We also continued our support for the Raine Study, which celebrated its 30 year anniversary since the Raine Foundation provided initial support to start this internationally acclaimed longitudinal study.

ENDURING PARTNERSHIPS

Over 50% of the funding distributed by the Raine Foundation in 2019 was committed by our generous partners and donors who strongly align with Mary Raine’s vision of achieving better health outcomes for the community. Our major partners and supporters in 2019 were the WA State Government Department of Health, The University of Western Australia, the BrightSpark Foundation, the Jon and Caro Stewart Family Foundation, the Charter Hall Group, the Forrest Research Foundation, and the Rigby Family. We are incredibly grateful for their continued support.

NEWLY AWARDED FUNDING

This year we consolidated our main funding areas into five priority programs that continue to support research excellence and the development of medical research leadership in Western Australia.

Raine Priming Grant program

We have now distributed nearly \$30 million towards this program, with a proud history of supporting the research and careers of WA’s best early-career medical researchers. Seven grants were awarded to commence in 2020, with a total funding pool of \$1,178,861.

- **Raine/Robson Fellow** – This title was awarded to the top applicant, Dr Lucy Furfaro from the UWA Division of Obstetrics and Gynaecology, for her research investigating the implications of bacteriophage exposure on maternal health and disease.
- **Raine/BrightSpark Fellow** – Dr Emma De Jong from the Telethon Kids Institute was awarded this title for her research in the area of child health looking at using immune memory responses to predict asthma disease trajectories.
- **Raine/Cockell Fellow** – This title was awarded to Dr Rebecca Bennett from the Ear Science Institute Australia for her research in the area of mental illness, concentrating on helping adults with hearing loss manage their mental health.

Clinician Research Fellowship program

This program was established through a partnership with the WA Department of Health and aims to support high achieving clinicians, allied health professionals and nurses, to facilitate their early research careers for the advancement of medical research outcomes and translation in the clinical setting. This program continues to be a great success, with 33 Clinician Research Fellowships supported since 2012 and a total funding commitment of over \$8.7mill. Three new Fellowships were awarded for Round 8 to commence in 2020, with a total funding allocation of \$946,207.

Awards & Prizes programs

Facilitating collaboration between key leaders and our WA researchers has always been a strong focus for the Foundation for the development of international quality research in the state. All of our Awards & Prizes programs align with this objective.

- **Research Collaboration Awards** – These awards aim to encourage medical researchers in Western Australia to establish and develop national and international collaborative research activities. Six Awards were granted across three different partnership categories, spanning early career researchers, child health and mental illness, with a total funding pool of \$142,653.



- **Publication Prizes** – These Prizes are awarded for the best published research by an early-career researcher and facilitate conference travel and research collaboration. Two Awards were granted for travel in 2020 at the value of \$5,000 each.
- **Raine Visiting Professor Awards** – This program was established in 1971 and facilitates the visits of distinguished scientists to Western Australia to impart their vast knowledge and expertise. Six Raine Visiting Professor Awards were funded for future visits, with a total funding allocation of \$38,872, and accommodation provided by the Forrest Research Foundation at Forrest Hall. The supported Professors hail from the UK, USA, China, New Zealand and Canada.

GRANT REVIEW AND COMMITTEES

The Raine Management Office works hard to continuously improve our grant review processes to align with international best practice, and to minimise redundancy in application forms. This is strengthened by the knowledge and expertise of our committee and advisory panel members, and the hundreds of top international and national researchers we contact each year to review our applications. They are all volunteers, who give their time to ensure that we only invest in the very best research in WA. We have enormous gratitude for the commitment and passion of Dr Richard Choong, who served as the Australian Medical Association representative on the Raine and Healy Research Committees for six years and stood down at the end of 2019. The strong leadership and guidance provided by these volunteers has strengthened our reputation and commitment to medical research in WA.

Robyn Owens

PROFESSOR ROBYN OWENS
Chair

DIRECTOR’S REPORT



our programs to encourage these thought processes across the project lifecycle. This aligns with developments in the international and national medical research landscape and provides a more thorough process for assessing and communicating research impact.

A review of the funding available for our existing programs highlighted the need to maintain relevance and to increase support where possible. This resulted in an increase in total funding that each applicant could apply for in some of our larger programs, and an increase in the total funding pool. This was accompanied by an increase in commitment from our partners,

This year, the Raine Foundation has expanded capacity and efficiency in our systems and programs so that we can best support the research community. This included consolidation of our funding programs to streamline application and review processes, and inclusion of research impact pathway questions in

who also recognise the need to maintain the feasibility and quality of supported research and the increasing costs for research.

In 2020, we plan to progress strategic review activities to chart a path for growth and impact through increased engagement with key stakeholders such as alumni, partners and the wider community. A new website is planned which will be more user friendly and will feature our research stories and impact. We will also start an evaluation program that tracks research impact and career progression of the 500+ alumni and projects we have supported over the last 60 years. This is all possible due to the enormous support provided by our committees and advisory panel members, who have volunteered their time and expertise. My thanks also go to my new Raine Management Office team, who provide a constant source of great ideas and commitment to the Foundations cause.

Amanda Cleaver
DR AMANDA CLEAVER, DIRECTOR

IN MEMORY OF MEG SANGSTER (1922-2019)

The Raine Foundation is forever grateful for the extraordinary mind of Meg Sangster and her passion for relaying the life and achievements of Mary Raine.

Meg and her late husband, Eric (Cole) Sangster became close friends with Mary and Joe Raine when they moved to WA from NSW in 1948. Mary Raine was an astute businesswoman who owned a large portfolio of property and hotels, including the Wentworth and Windsor Hotels. Meg and Cole initially stayed at the Wentworth Hotel when they arrived in WA, which was then managed by, and home to, Mary and Joe Raine. They soon became close friends and in 1949 Mary and Joe asked Meg and Cole to manage the Windsor Hotel. This was an overwhelming but exciting offer for the young couple who soon accepted the challenge and later the leasehold of the Hotel.

Meg and Cole were instrumental in turning business around for the Windsor Hotel and soon introduced the concept of the beer garden and jugs of beer to WA. Meg authored and published “The Mary Raine Story – From Putney to Perth” in 2001, recounting the extraordinary life and times of Mary Raine, and Meg’s personal journey as an unexpected but hugely successful hotelier in WA.



Meg will forever be remembered as a strong and passionate supporter of the Raine Medical Research Foundation in upholding Mary Raine’s vision of finding cures for human disease.

RESEARCH FUNDING

RAINE PRIMING GRANTS AWARDED IN 2019

Building the next generation of research leaders

This program supports early-career researchers to develop research independence and leadership, while building their skills and track record so that they are competitive for national and international funding.



DR RYAN ANDERTON
School of Health Sciences, University of Notre Dame Australia, Perron Institute for Neurological and Translational Sciences
Investigating a novel class of peptide as a therapeutic for neurodegenerative disorders
\$174,902



DR REBECCA BENNETT
(Raine/Cockell Fellow)
Clinical Research, Ear Science Institute Australia
Helping adults with hearing loss manage their mental health
\$179,423



DR LUCY FURFARO
(Raine/Robson Fellow)
Division of Obstetrics and Gynaecology, The University of Western Australia
Bacteriophage exposure in utero: Implications for health and disease
\$246,407



DR EMMA DE JONG
(Raine/BrightSpark Fellow)
Telethon Kids Institute, The University of Western Australia
Predicting asthma disease trajectories through systems-level analyses of immune memory
\$215,000



DR AVENI HAYNES
Child Health Research, Telethon Kids Institute
Informing T1D prevention strategies by identifying early dysglycaemia in children at risk
\$69,625



DR LAKSHINI HERAT
School of Biomedical Sciences and Dobney Hypertension Centre, The University of Western Australia
A novel role for sodium glucose co-transporter 2 in diabetic retinopathy and nephropathy
\$99,865



DR ALEXANDER TANG
School of Biological Sciences, The University of Western Australia
Harnessing neuroplasticity in the young and old brain with brain stimulation
\$193,639



RAINE PRIMING GRANT

The Telethon Kids Youth Mental Health Team

Telethon Kids Institute, The University of Western Australia | Duration: 2017 – 2019 | \$150,000

DR ASHLEIGH LIN

Understanding the physical and mental health outcomes of gender affirming intervention

(GENTLE: The GENDER identiTy Longitudinal Experience Project)



Associate Professor Ashleigh Lin is an NHMRC Career Development Fellow and Program Head of the Mental Health and Youth team at the Telethon Kids Institute.

She received her Master of Clinical Neuropsychology and PhD in 2011 from The University of Melbourne. Associate Professor Lin commenced her Raine Priming Grant in 2017 to investigate health and wellbeing through

the lifespan of people who have accessed hormonal gender affirming intervention in adolescence through the development of the GENTLE cohort.

The GENTLE cohort is made up of all clients at the Gender Diversity Service at the Perth Children's Hospital in WA who consent to their mental and physical health data being used for research purposes. There have been three publications from the study on the impact of hormones on the physical and mental health of trans and gender diverse children and adolescents. One finding is that there is a relatively high occurrence of autism traits in the young people who are part of the GENTLE cohort and that those individuals with autism traits have poorer mental health. Researchers have also developed a group intervention program, Transforming Families, for parents and carers of adolescents in the GENTLE cohort to assist them in better supporting their child. Five higher education

students and 10 interns have also contributed to the project to date, thereby supporting the career development of the next generation of early-career researchers.

At the conclusion of this Raine Priming Grant, there were 165 young people in the GENTLE cohort and the cohort continues to grow. The project has obtained additional funding, building the cohort further with the aim to continue to assess and support the physical and mental health of adolescents seeking gender affirming intervention.



RAINE PRIMING GRANT

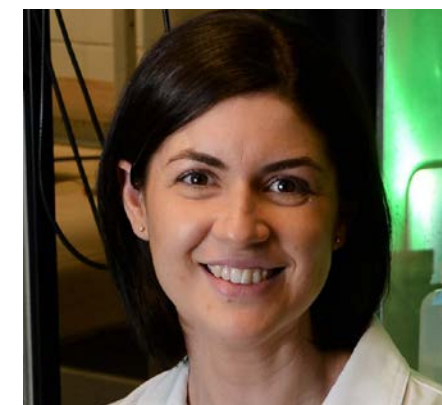
CSANZ 66th Annual Scientific Meeting. Dr Jim Bell, Dr Helena Viola, Professor Livia Hool

School of Human Sciences, The University of Western Australia | Duration: 2017 – 2019 | \$150,000

DR HELENA VIOLA

Identification of a preventative treatment for the leading cause of sudden cardiac death in the young

(A novel approach for the prevention of hypertrophic cardiomyopathy)



Dr Helena Viola is a Heart Foundation Future Leader Fellow in the School of Human Sciences at The University of Western Australia. She completed her PhD with Distinction in 2010, being awarded the UWA Robert Street Prize for most outstanding PhD thesis across all disciplines. Dr Viola commenced her Raine Priming Grant in 2017 to identify a novel, early-intervention therapy for hypertrophic

cardiomyopathy (thickening of the heart muscle), which is the leading cause of sudden cardiac death in the young. There is currently no treatment available to prevent this disease.

Over the course of her research career, Dr Viola has identified that a calcium channel in the membrane of heart cells regulates heart metabolism, and that the activity of this calcium channel is impaired in hypertrophic cardiomyopathy.

This research has discovered a new early-intervention approach to prevent hypertrophic cardiomyopathy by normalising heart metabolism using a drug that targets this calcium channel. Once translated this will significantly decrease associated morbidity and mortality.

The findings from this study have led to 10 publications in highly rated journals, including Nature Communications and

Science Advances, as well as a patent pending for the identified drug treatment. Since commencing the Raine Priming Grant, Dr Viola has been successful in obtaining additional national grant funding (Heart Foundation & NHMRC). This has assisted her to further investigate the potential treatment effects of the identified drug on decreasing extracellular matrix stiffness (associated with the cardiomyopathic heart) and preventing sudden cardiac death.

"I am extraordinarily grateful to have received funding from the Raine Medical Research Foundation and the possibilities that have resulted. It has enabled me to produce critical preliminary data for two major funding applications, including a NHMRC New Investigator Grant, and a National Heart Foundation Future Leader Fellowship. I was delighted to be awarded both."

CLINICIAN RESEARCH FELLOWSHIPS (ROUND 8) AWARDED IN 2019

Enabling clinicians to improve health care through medical research

This program enables clinicians, nurses and allied health professionals to establish a research career while still maintaining their clinical role, seeking to broaden their impact on Western Australian health outcomes and support rapid research translation to clinical practice.

NUMBER OF
APPLICATIONS:

17

Number shortlisted
for external review:

5

4

SUCCESSFUL
(23.5% success rate, 1 later declined)

AMOUNT
AWARDED:

\$946,207



DR MARY ABRAHAM
Perth Children's Hospital
Hybrid closed loop system in adolescents with sub-optimal glycaemic control
\$344,264



DR EMMA HAMILTON
Fiona Stanley Hospital
Improving outcomes for patients with diabetes-related foot disease
\$403,809



DR DAYSE TAVORA-VIEIRA
Fiona Stanley Hospital
The use of electrophysiology to optimise hearing implants in hearing-impaired recipients
\$198,134

"This fellowship has not only helped me generate multiple publications, establish collaborations and success in competitive grant funding, it has enabled me to provide a greater engagement and mentorship of future clinician-scientist and researchers, which are critical in ensuring the continuity of clinically-relevant and quality research going forward"

Clinical Professor Wai Lim



CLINICIAN RESEARCH FELLOWSHIP

Sir Charles Gairdner Hospital

Duration: 2017 – 2020

\$429,400

CLINICAL PROFESSOR WAI LIM

Improving health outcomes of kidney transplant recipients

(Increased understanding of the immunological risk profile for kidney transplant patients and better long-term health outcomes)



Clinical Professor Wai Lim is a Consultant Nephrologist at Sir Charles Gairdner Hospital and Past Chair of the Western Australia Kidney Transplant Service. He was awarded a Clinician Research Fellowship to elucidate the mechanisms underlying renal injury and disease recurrence in kidney transplant recipients and to develop an alternative allocation system for available donor kidneys in Australia to maximise successful transplantation rates and longevity. Chronic kidney disease is a highly prevalent non-communicable health problem in Western Australia and globally is associated with substantial loss of productivity. Health-related complications, including rejection, heart

disease, and other blood vessel complications are relatively common for chronic kidney disease and kidney transplant patients. Therefore, improving ways to identify those at risk and to discover novel agents that may be effective in reducing these complications are essential to improve the long-term health outcomes and quality of life of people with chronic kidney disease.

The studies undertaken during this fellowship have shown that alternative allocation policies that match the life expectancy of donor kidneys with the patients could potentially increase the availability of donor kidneys to disadvantaged groups and increase the survival of people with chronic kidney disease. Additionally, a greater understanding of the immunological risk profile for kidney transplant patients and the identification of novel risk factors and potential interventions for cardiac disease may help to improve the long-term health outcomes of people with chronic kidney disease.

This fellowship has been successful in generating multiple publications (over 60 since 2017), providing support/supervision for higher degree students and advanced

trainees, disseminating study findings at national and international meetings, establishing collaborations and obtaining additional competitive funding, and has enhanced the standing of Western Australia as a quality hub for research activities. The findings generated from this fellowship have contributed to changes in health policy and improved clinical decision-making processes in patient management.

Clinical Professor Lim is grateful to the WA Department of Health and the Raine Medical Research Foundation for the financial support offered through the Fellowship, which has allowed the expansion of his research activities, enhanced collaboration with researchers globally, and assisted the advancement of knowledge with the ultimate goal of improving health outcomes of kidney transplant recipients and people with chronic kidney disease.



CLINICIAN RESEARCH FELLOWSHIP

2019 PROTECT investigator meeting

 King Edward Memorial Hospital

 Duration: 2017 – 2020

 \$412,154

CLINICAL PROFESSOR TOBIAS STRUNK

Improving survival rates and reducing disability in preterm infants

(Can Pentoxifylline improve survival without disability in preterm infants with late-onset sepsis or necrotizing enterocolitis – a pragmatic randomised controlled trial?)



Clinical Professor Tobias Strunk is a Consultant Neonatologist with the Neonatal Intensive Care Unit at King Edward Memorial Hospital for Women (KEMH).

He was awarded a Clinician Research Fellowship to investigate whether an anti-inflammatory, safe medication called Pentoxifylline has the potential to increase survival without disability in babies born very early (more than 3 months early).

Survival of preterm infants has improved dramatically over the past decades, but these vulnerable infants still account for most of neonatal illness and long-term complications. Bloodstream infections (sepsis) and gut injury (necrotising enterocolitis) are common serious complications of preterm birth and may lead to life-long disability. In this trial, the research team is investigating whether Pentoxifylline, when given in addition to routine care in infants with suspected bloodstream infection or gut injury, can improve survival into childhood without disability.

Working with international collaborators in Singapore, Taiwan, Canada and Ireland, this randomised control trial will include 1800 preterm infants with a clinical presentation of late-onset sepsis or necrotizing enterocolitis. Professor Strunk has also been working in close collaboration with KEMH pharmacists and Curtin University to establish extensive testing for physical compatibility of intravenous medications that are commonly

co-infused in neonatal intensive care, providing the most complete and systematic assessment to date and resulting in several publications on this topic. The research findings have been applied clinically through their addition to the KEMH medication compatibility chart, which is hosted on the KEMH website and accessed daily by Neonatal Units nationally.

Professor Strunk is grateful to the WA Department of Health and the Raine Medical Research Foundation for the ability to have dedicated research time through the Fellowship. This has allowed significantly increased research outputs, with 30 new publications since 2017, and led to additional grant applications for national funding. Professor Strunk will continue to work on achieving the aims of this highly relevant project, with the potential for the findings of this novel treatment approach to be rapidly translated into routine clinical practice.

RESEARCH COLLABORATION AWARDS AWARDED IN 2019

Connecting emerging and established research leaders across the globe

This program facilitates the development of new collaborations and projects with national and international partners, supporting skill development and knowledge transfer.

NUMBER OF APPLICATIONS:

12 

6 
SUCCESSFUL
(50% success rate)

AMOUNT AWARDED: 
\$142,653



DR OLIVIER CLEMENT
(Cockell Research Collaboration Award)
Harry Perkins Institute of Medical Research, The University of Western Australia with Trinity College, Dublin
Unravelling the (epi)genomic regulatory mechanisms governing memory to understand cognitive decline in aging
\$19,590



DR LAURA DONDZILO
(Cockell Research Collaboration Award)
The University of Western Australia with the University of Münster, Germany
Efficacy of a novel self-appraisal induction in Body Dysmorphic Disorder
\$18,500



DR JULIE JI
(Cockell Research Collaboration Award)
The University of Western Australia with Uppsala University, Sweden
Investigating “flashforward” mental imagery of self-injury as a proximal risk barometer and modifiable treatment target
\$16,456



DR NICOLA BONDONNO
(Healy Research Collaboration Award)
Edith Cowan University with The University of Western Australia and Gentofte Hospital, Denmark
Investigating the relationship between dietary components and cardiometabolic disease
\$29,722.51



DR GIZACHEW TESSEMA
(Charter Hall Research Collaboration Award)
Curtin University with the Norwegian Institute of Public Health
Adverse birth outcomes and interpregnancy interval in Australia and Norway: A new international collaboration on the influence of pregnancy loss
\$28,951



DR AMY FINLAY-JONES
(BrightSpark Research Collaboration Award)
Telethon Kids Institute, The University of Western Australia with the University of California, USA
Beyond Brain and Behaviour: Understanding the role of the gut microbiome in infant and child mental health
\$29,433.42

COCKELL RESEARCH COLLABORATION AWARD



 **Children's Diabetes Centre, Telethon Kids Institute**
in collaboration with the *Interdisciplinary Center Psychopathology and Emotion Regulation (ICPE)*, Department of Psychiatry, University Medical Centre of Groningen, Netherlands

 **Duration: 2019**

 **\$14,911.80**

DR KEELY BEBBINGTON

Increased stress precedes increased blood glucose levels in adolescents with Type 1 Diabetes

(Characterising moment-to-moment fluctuation in stress, anxiety and blood glucose levels in children and adolescents with Type 1 Diabetes)



Dr Keely Bebbington is a McCusker Research Fellow working on Type 1 Diabetes (T1D) at the Telethon Kids Institute.

It is now well documented that children and adolescents with Type 1 Diabetes are at greater risk for psychological disorders than young people without diabetes. Understanding the interplay between stress and anxiety, blood

glucose levels and diabetes-related behavioural responses is essential for the development of effective interventions. However, to date, research in this area has failed to shed light on how stress, anxiety and blood glucose levels may vary, moment-to-moment.

The primary aim of this study was to investigate changes in stress, anxiety and blood glucose levels throughout the day using a novel technique known as experience sampling methodology (ESM) in combination with continuous glucose monitoring (CGM) technology. To analyse this complex data, Dr Bebbington collaborated with experts in the use of this methodology, based at The Interdisciplinary Center for Psychopathology and Emotion Regulation in Groningen, Netherlands. During an 11 day visit to Groningen, the researchers explored novel statistical approaches to the analysis of this time-series data.

The key findings of this research were that increases in state anxiety precede increases in sensor glucose levels. There was also considerable variability between individuals in the size of this effect. Additionally, this data can reveal individual differences in these associations which is vital information in the development of personalised interventions in this population and will allow further investigations of what works, for whom and in what context. The findings from this collaborative study are currently in preparation for publication.

These findings were presented at the American Diabetes Association Scientific Sessions in San Francisco in June 2019. At these sessions, Dr Bebbington was able to connect with experts in the area of mental health and Type 1 Diabetes, laying the groundwork for future collaborations.

HEALY RESEARCH COLLABORATION AWARD



 **School of Molecular Sciences, The University of Western Australia**
in collaboration with the *University of California (Los Angeles)* and the *National Physical Laboratory (London)*

 **Duration: 2018 – 2019**

 **\$10,000**

DR HAIBO JIANG

Novel methods to understand cholesterol balance

(Characterising development of a multimodal mass spectrometry imaging platform for lipid analysis)

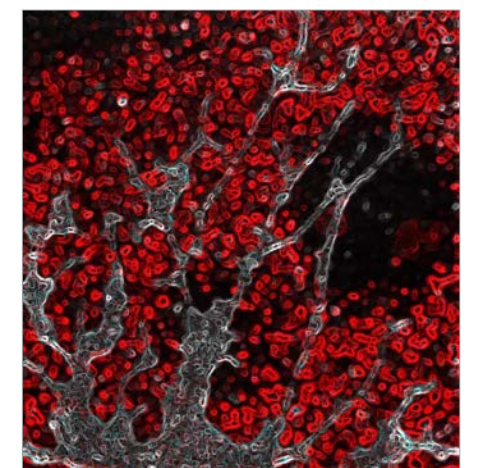


Dr Haibo Jiang is an ARC Discovery Early Career Researcher Award (DECRA) Research Fellow in the School of Molecular Sciences at The University of Western Australia. Dr Jiang's research is largely focused on the development of novel technologies to investigate molecular trafficking and metabolism and its impact on human health. While abnormalities in lipid metabolism can lead to major health conditions such as cardiovascular disease, analytical tools to study lipid distributions

and dynamics are limited. In this collaborative project, bringing together a world leading lipid biologist and a leading expert in imaging mass spectrometry, the researchers further developed a novel method that combines different advanced microscopy technologies to enable better investigation of molecular trafficking and metabolism.

Using this novel method, they discovered that macrophages release cholesterol-rich particles from projections on the cell surface. This process could be an important way that macrophages release excess cholesterol. Accumulation of excess cholesterol could lead to the development of atherosclerosis. Hence, the release of cholesterol-rich particles could be an important mechanism that macrophages use to maintain cholesterol balance, which is critical for human health. These collaborative activities and studies have resulted in two peer-reviewed publications and multiple presentations across the world, including invited talks at conferences. Dr Jiang has established

ongoing collaborations as a result of this project, which has led to an ARC Linkage Project grant and another grant application in planning.



In this collaboration, Dr Jiang and his team discovered that macrophages release cholesterol-rich particles (red) from filopodia (grey).

PUBLICATION PRIZES AWARDED IN 2019

Facilitating dissemination of research knowledge

These Prizes are awarded to early-career scientists who have published high-quality research that has advanced their medical research field. The Prize facilitates conference travel and collaborative research activities.

NUMBER OF APPLICATIONS:

10

2

SUCCESSFUL

(20% success rate)

AMOUNT AWARDED:

\$10,000



DR RACHAEL ZEMEK
(Raine Research Prize)
Cancer Centre
Telethon Kids Institute
Sensitization to immune checkpoint blockade through activation of a STAT1/NK axis in the tumor microenvironment
Published in Science Translational Medicine
\$5,000



DR AVENI HAYNES
(Strachan Memorial Prize)
Children's Diabetes Centre
Telethon Kids Institute
Decreasing trends in mean HbA1c are not associated with increasing rates of severe hypoglycaemia in children: A longitudinal analysis of two contemporary population-based pediatric type 1 diabetes registries from Australia and Germany/Austria between 1995 and 2016
Published in Diabetes Care
\$5,000

STRACHAN MEMORIAL PRIZE

Department of Respiratory Medicine
Sir Charles Gairdner Hospital

Duration: 2019

\$5,000

DR RAJESH THOMAS

New strategies to improve outcomes for lung disease

(Effect of an indwelling pleural catheter vs talc pleurodesis on hospitalization days in patients with malignant pleural effusion: The AMPLE randomized clinical trial)



The 2019 recipient of the Strachan Memorial Prize was Dr Rajesh Thomas from the Department of Respiratory Medicine, Sir Charles Gairdner Hospital, for his article entitled "Effect of an indwelling pleural catheter vs talc pleurodesis on hospitalization days in patients with malignant pleural effusion: The AMPLE randomized clinical trial" published in Journal

of the American Medical Association (Thomas et al., JAMA. 2017; 318(19): 1903-1912).

Dr Thomas' research aims to identify treatment and management strategies for malignant pleural effusions to reduce hospitalisation stay times, relieve breathlessness and provide freedom for physical activity for patients with the disease.

The Strachan Memorial Prize assisted Dr Thomas to attend multiple national and international conferences. In October 2019, he attended the American College of Chest Physicians CHEST Conference in New Orleans, USA, the world's largest clinical chest medicine event. During this conference, Dr Thomas presented and chaired three sessions, where he shared the stage with several world leaders and key opinion makers in pleural medicine. These sessions were well attended and he

received positive feedback from presenters and attendees alike, which has led to a number of potential future collaborators for his ongoing research.

In November 2019, he presented as an invited speaker at the Joint National Conference of Indian Chest Society & National Colleges of Chest Physicians in Kochi, India. He also presented at two conferences held in the Gold Coast in early 2019; the Thoracic Society of Australia & New Zealand Conference and the Asia-Pacific Congress on Bronchology, in early 2019. His presentations at these four conferences in 2019 has led to invitations to speak at upcoming international conferences in 2020.

Since receiving the Strachan Research Prize, Dr Thomas has co-authored nine further publications in the field.

VISITING PROFESSOR AWARDS AWARDED IN 2019

Connecting the best international medical researchers with WA

This program facilitates the visits of national and international distinguished research scholars to Western Australia to share their knowledge and skills through collaborative research projects, workshops, lectures, training and mentoring.



PROFESSOR WICKLIFFE ABRAHAM
University of Otago, New Zealand
 Host: Dr Alexander Tang
 Perron Institute for Neurological and Translational Science, The University of Western Australia
\$2,555.50



PROFESSOR DAVID ARMSTRONG
Keck School of Medicine, University of Southern California, USA
 Host: Mr Olufemi Oshin
 Curtin University
\$7,100



PROFESSOR ORNIT CHIBA-FALECK
Department of Neurology, Duke University, USA
 Host: Professor Patrick Akkari
 Perron Institute for Neurological and Translational Science
\$5,000



PROFESSOR CHRIS HAMMOND
King's College London, UK
 Host: Professor David Mackey
 Lions Eye Institute, The University of Western Australia
\$5,400



PROFESSOR MICHAEL RIDDELL
York University, Canada
 Host: Professor Elizabeth Davis
 Telethon Kids Institute
\$11,400



PROFESSOR ERWEI SONG
Sun Yat-Sen Memorial Hospital, Sun Yat-Sen University, China
 Host: Professor Ruth Ganss
 Harry Perkins Institute of Medical Research
\$7,416.30



RAINE VISITING PROFESSOR AWARD

University of Sydney, Australia
 Host: Dr Elin Gray, Edith Cowan University

Visit: 19 March 2019 – 19 April 2019

\$3,790

PROFESSOR DES RICHARDSON

Overcoming treatment resistant cancers

(Raine Lecture: From bench-to-bedside: Novel anti-cancer agents that overcome the triad of death – metastasis, resistance and tumour growth)



Professor Des Richardson is a NHMRC Principal Research Fellow and Director of the Molecular Pharmacology and Pathology program at The University of Sydney. A multi-disciplinary researcher in drug development and translation, Professor Richardson is a pharmacist, biochemist and cell and molecular biologist. Over the course of his thirty-year career, he has endeavoured to dissect cancer mechanisms and develop anti-cancer drugs to overcome the three major killers in cancer: Metastasis, drug resistance and tumour growth. In fact, as a rare achievement in Australia, he accomplished bench-to-bedside translation of his innovative anti-cancer drug that has entered clinical trials for the treatment of advanced and resistant cancer.

Professor Richardson has published more than 400 articles, reviews, books and patents, made over 560 presentations, is a member of 43 Journal Editorial Boards, and has been awarded 293 competitive grants, including 68 NHMRC Grants/Fellowships. He has supervised more than 100 higher education students and is a triple prize-winning mentor, being recognised both locally (USYD Vice-Chancellor's Award for Excellence in Research Higher Degree Supervision) and internationally.

Professor Richardson was invited as a Raine Visiting Professor by Dr Elin Gray from the School of Medical and Health Sciences at Edith Cowan University (ECU), with the objective of establishing collaborative activities in understanding mechanisms of melanoma growth and overcoming drug resistance. During Professor Richardson's visit, he conducted a lecture titled "From bench-to-bedside: Novel anti-cancer agents that overcome the triad of death – metastasis, resistance and tumour growth" as part of the Raine Visiting Professor Lecture series. In addition to this lecture, he delivered presentations to researchers and institutions across Perth (including at UWA, Harry Perkins Institute of Medical Research, and Curtin University), as well as a Master Class with early-career researchers to discuss

careers in research, grant writing and potential collaborative opportunities.

As a result of discussions during his visit and collaboration, an Edith Cowan University PhD student secured a university grant to visit and work in Professor Richardson's lab at the University of Sydney. Further collaborative projects are also in development, including co-supervision of PhD students and grants applications.



Professor Mel Ziman, Professor Des Richardson and Associate Professor Elin Gray.



RAINE VISITING
PROFESSOR AWARD



Mayo Clinic, USA
Host: Associate Professor Jennifer Rodger, The Perron
Institute for Neurological and Translational Science



Visit: 28 May 2019 – 5 June 2019



\$1,180

PROFESSOR PAUL CROARKIN

Latest brain-based interventions for young people
with psychiatric disorders

(Raine Lecture: Recent innovations and developments in neuromodulation for child and adolescent psychiatric disorders)



Professor Paul Croarkin is Director of the Mayo Clinic Depression Center with the Department of Psychiatry and Psychology at the Mayo Clinic, USA. He is a child and adolescent psychiatrist and neuroscientist with a research program focused on adapting and innovating brain stimulation interventions for young people.

Dr Croarkin’s research has been funded by the National Alliance for Research on Schizophrenia and Depression, the National Institutes of Health, and Industry partnerships. His findings have been published in numerous prestigious journals such as American Journal of Psychiatry, JAMA Psychiatry, and

Neuropsychopharmacology. Dr Croarkin has mentored many students and residents, for which he has been recognised with several honours. He was awarded the 2017 National Institute of Mental Health Biobehavioral Research Award for Innovative New Scientists (NIMH BRAINS). He is a Distinguished Fellow of the American Psychiatric Association.

Dr Croarkin was invited as a Raine Visiting Professor by Dr Jennifer Rodger from The Perron Institute for Neurological and Translational Science. The aim of his visit was to foster ongoing clinical and translational collaboration focused on healthy youth neurodevelopment and novel, brain-based interventions for child and adolescent neuropsychiatric disorders.

During his visit, Dr Croarkin presented research seminars at the University of Western Australia, Telethon Kids Institute, and Fiona Stanley Hospital, including a lecture titled “Recent innovations and developments in neuromodulation for child and adolescent psychiatric disorders” for the Raine Visiting Professor Lecture Series. Dr Croarkin was also a guest speaker at a student and early career researcher discussion forum at the Perron

Institute to share information about science careers and pathways in the United States. Furthermore, he consulted with local clinicians at Sir Charles Gardiner Hospital to assist with the development of innovative clinical neuromodulation treatments.

Dr Croarkin’s visit has resulted in a number of collaborative initiatives, including submission of a co-authored scientific publication, a shared grant application, and two further research projects in development, one with industry. Additionally, Dr Croarkin has extended an invitation for a WA PhD student to present at the prestigious Conference of the American College of Neuro-Psychopharmacologists, as well as to visit the laboratories and clinics at the Mayo Clinic and University of Minnesota in the USA.



Ms Leanne Jiang, Ms Abbey Ford, Professor Paul Croarkin, Associate Professor Jennifer Rodger



THE RAINE STUDY

Advancing knowledge, enhancing lives

The Raine Medical Research Foundation awarded a major research grant in 1989 for the establishment of the West Australian Pregnancy Cohort Study. It was later named “The Raine Study” to acknowledge the original grant from the Raine Foundation and its founder Mary Raine. The Raine Medical Research Foundation continues to provide funding support for the Raine Study, 30 years on.

The Raine Study aimed to develop a long-term cohort to research the role that early life events (from the womb onwards) had on later life. From 1989 to 1991, 2,900 pregnant women (Generation 1) volunteered to be part of the study. Since the Raine Study was established, the children (Generation 2) have been followed up at regular intervals providing an increasingly rich source of data for local, national and international research. Their families are also part of the study, with their grandparents (Generation 0) and children (Generation 3) now also involved in the study. The Raine Study is one of the largest prospective cohorts of pregnancy, childhood, adolescence and adulthood to be carried out anywhere in the world.

More than
30,000
pieces of data (and >30 million
pieces of genetic information)
have been collected on each
of the Gen2 participants in the
past 30 years

More than
400
babies, Generation 3 (Gen3),
have been born to the Raine
Study cohort participants
(estimated to reach 1,500
babies within 10 years)

Over
500
peer reviewed journal
articles have been
published on the Raine
Study resources

In 2019 it was
30
years
since the Raine
Study began



RAINE ANNUAL AWARDS CEREMONY

Each year we celebrate the achievements of our past and present awardees at our breakfast awards ceremony. We were honoured to welcome distinguished guests and alumni, including our guest speakers, Professor Christobel Saunders and Dr Gail Alvares, who spoke about their research and career highlights that came about due to the support of the Raine Foundation. Congratulations go to all of our 2019 awardees.



Professor Robyn Owens Ms Jemma Collova, Ms Dielle Horne Professor Tim Colmer, Emeritus Professor Alan Robson, Dr Campbell Thomson

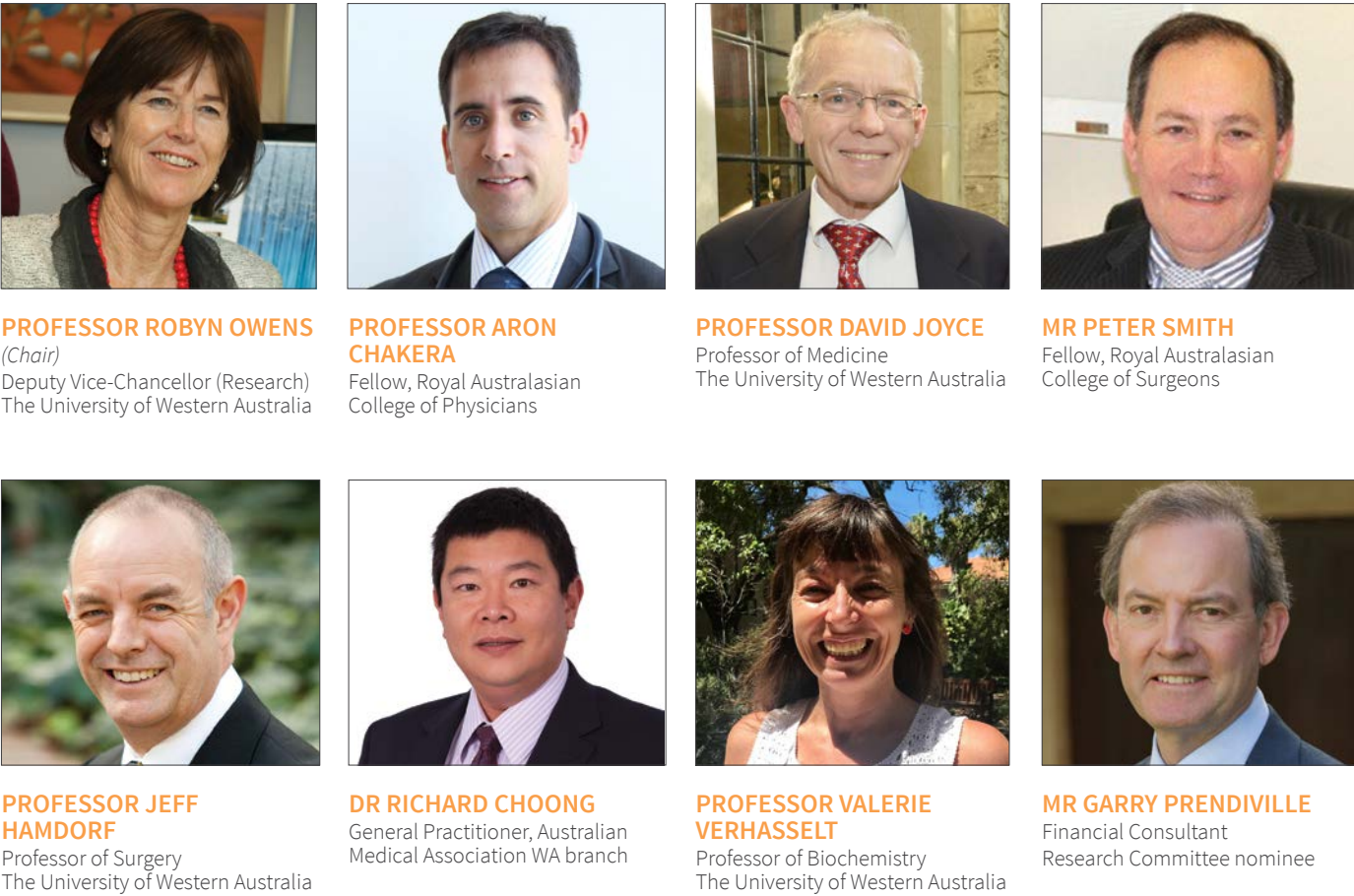
Dr Richard Vaughan, Dr Andrew Miller, Dr Bennie Ng Professor Christobel Saunders Dr Aveni Haynes, Dr Rachel Zemek

Dr Gail Alvares Dr Mary Abraham, Dr Emma Hamilton Professor Elizabeth Davis, Mr Andrew Thompson, Dr Emma de Jong, Dr Amanda Cleaver, Mr Tony Barber

OUR PEOPLE

All members of our Research Committee and Advisory Committees are volunteers. We thank our members for their generosity of time and expertise in ensuring that we support the very best medical research in Western Australia.

RESEARCH COMMITTEE



PROFESSOR ROBYN OWENS
(Chair)
Deputy Vice-Chancellor (Research)
The University of Western Australia

PROFESSOR ARON CHAKERA
Fellow, Royal Australasian
College of Physicians

PROFESSOR DAVID JOYCE
Professor of Medicine
The University of Western Australia

MR PETER SMITH
Fellow, Royal Australasian
College of Surgeons

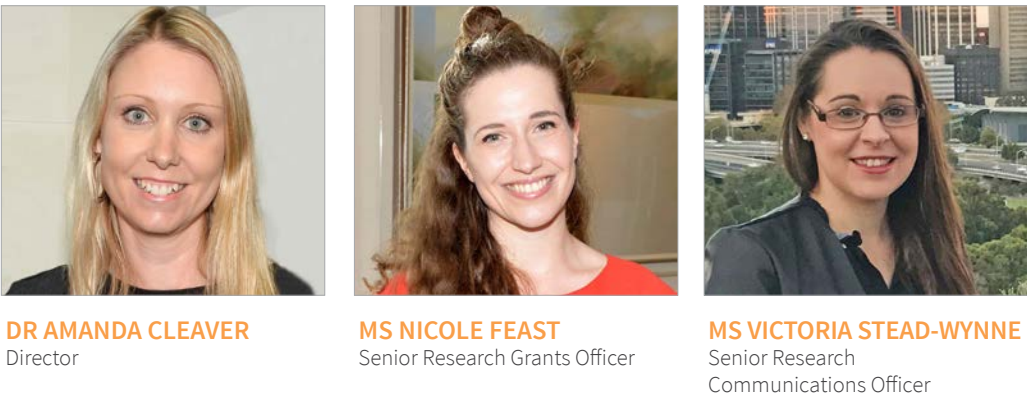
PROFESSOR JEFF HAMDORF
Professor of Surgery
The University of Western Australia

DR RICHARD CHOONG
General Practitioner, Australian
Medical Association WA branch

PROFESSOR VALERIE VERHASSELT
Professor of Biochemistry
The University of Western Australia

MR GARRY PRENDIVILLE
Financial Consultant
Research Committee nominee

RAINE MANAGEMENT OFFICE

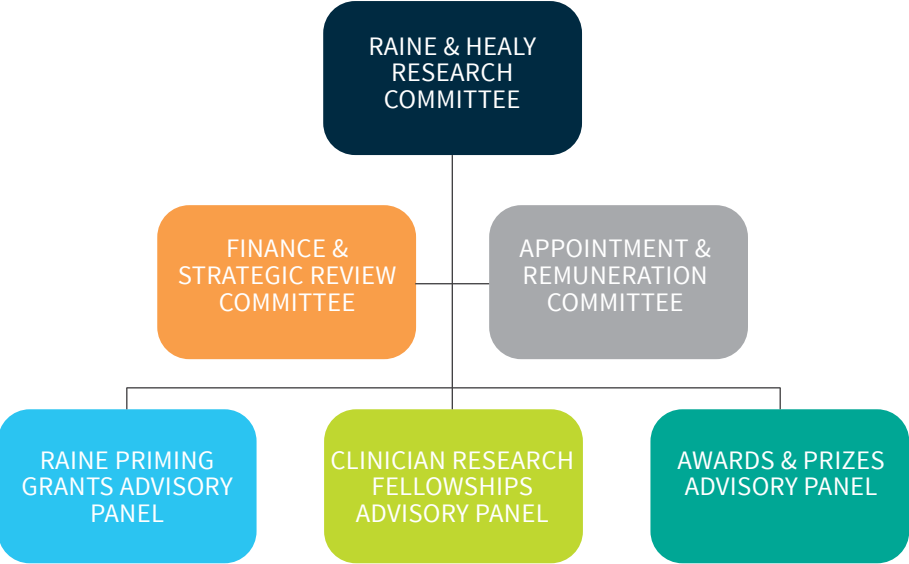


DR AMANDA CLEAVER
Director

MS NICOLE FEAST
Senior Research Grants Officer

MS VICTORIA STEAD-WYNNE
Senior Research
Communications Officer

GOVERNANCE STRUCTURE

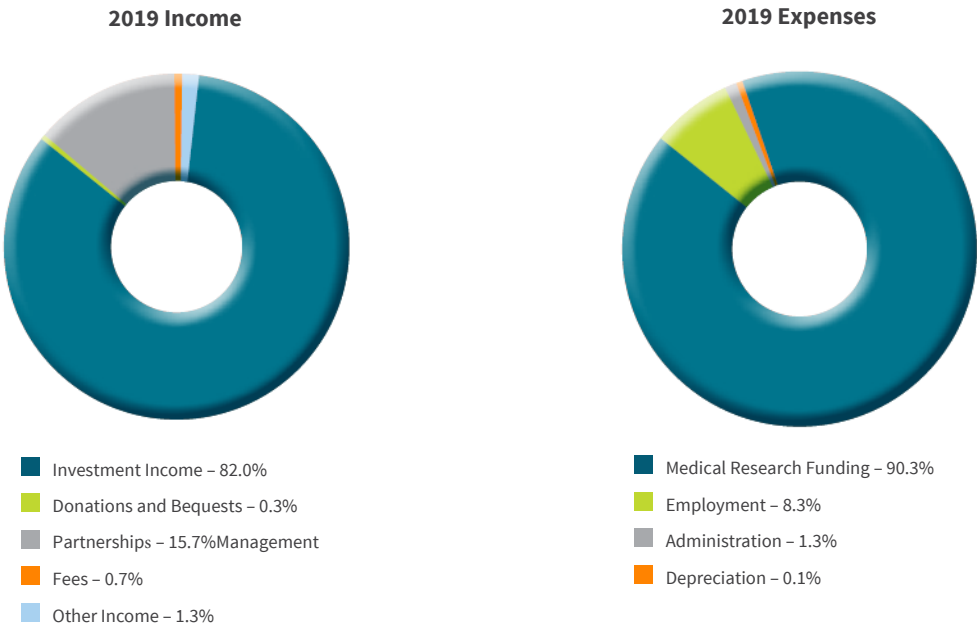


ADVISORY COMMITTEES

FINANCE & STRATEGIC REVIEW COMMITTEE	APPOINTMENT & REMUNERATION COMMITTEE	RAINE PRIMING GRANTS ADVISORY PANEL	CLINICIAN RESEARCH FELLOWSHIPS ADVISORY PANEL	AWARDS & PRIZES ADVISORY PANEL
Mr Garry Prendiville (Chair)	Professor Robyn Owens (Chair)	Associate Professor Steven Mutsaers (Chair)	Mr Darren Gibson (Chair)	Professor Robyn Owens (Chair)
Mr Geoff Anderson	Professor David Joyce	Dr Amanda Cleaver (Director)	Professor Garry Allison	Dr Amanda Cleaver (Director)
Mr Tony Barber	Mr Garry Prendiville	Professor Elizabeth Davis	Dr Aron Chakera	Dr Andrew Currie
Dr Richard Choong		Dr Archa Fox	Dr Amanda Cleaver (Director)	Professor Gerard Hoyne
Dr Amanda Cleaver (Director)		Professor Brendan McQuillan	Professor Lindy Fitzgerald	Professor David Joyce
Mr Graham Dowland		Professor Phil Stumbles	Ms Jodie Hegarty	Professor Anna Nowak
Mr Peter Smith		Professor Valerie Verhasselt	Professor David Joyce	Professor Andrew Page
Mr Andrew Thompson		Dr Lisa Wood	Professor Anne Williams	

FINANCIAL REPORTS

RAINE MEDICAL RESEARCH FOUNDATION
Financial Summary as at 31 December 2019



NB. Both Partnerships income and the Medical Research Funding expense reflect the consolidated position of the Raine Medical Research Foundation and its associates.

INVESTMENT BALANCES		
	2019	2018
Investments		
Corpus	32,000,028	28,588,800
Research Committee Capital Research	10,895,044	9,052,606
Committee Operations Donations & Bequests	234,483	398,900
	190,610	15,585
Total Pool Investments	43,320,165	38,055,891
Other Investments – Market Value		
24/95 Monash Avenue (Hollywood)	482,850	482,850
Dexus Property Group (DEXUS) Holdings	2,641,860	2,397,996
Dexus Property Group (DEXUS) Imputation Credit (Accrual)	4,757	7,207
Total Other Investment – Market Value	3,129,467	2,888,053
TOTAL ASSETS	46,449,631	40,943,944
Liabilities		
Provision for leave	26,882	22,108
TOTAL LIABILITIES	26,882	22,108
TOTAL NET ASSETS	46,422,749	40,921,836

NB. The Raine Financial Summary is extracted from the full financial statements. The full financial statements of the Raine Medical Research Foundation can be obtained from the Director upon request.



2019 Income



Investment Income – 100%

2019 Expenses



Medical Research Funding – 82%
Management Fee – 18%

INVESTMENT BALANCES		
	2019	2018
Investments		
Corpus	1,980,461	1,765,753
Research Committee Operations	104,666	65,984
Total Pool Investments	2,085,127	1,831,737
TOTAL NET ASSETS	2,085,127	1,831,737

NB. The Healy Financial Summary is an extract of the full financial statements. The full financial statements of the Healy Medical Research Foundation can be obtained from the Director upon request.

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RAINE
MEDICAL RESEARCH FOUNDATION