Otago Medical Research FOUNDATION

# 2022 Annual Report

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Charities Number: CC33444


OMRF.ORG.NZ

# ABOUT THE FOUNDATION

*The Otago Medical Research Foundation "OMRF" is dedicated to supporting important medical research carried out in the Otago region, and encouraging young and gifted people to engage in research.*

The Foundation supports innovative, early stage medical research projects and student summer research scholarships in Otago.

Founded in 1967 to further medical research in Otago, we have committed almost $11 million dollars to a broad range of medical research projects. The Foundation is a careful steward of donations, and we do not receive any Government funds. Research is undertaken in Otago with funds raised from a variety of bequests, trusts, individual and corporate sponsors, and a number of fundraising events each year.

## OUR FUNDS ARE:

**Annual Grants –** our premier round of year-long, innovative early-stage research projects, normally up to $40,000 per grant.

**Student Summer Research Scholarships –** 10-week student summer research projects, supervised by senior researchers. These often lead to research and teaching careers for the students, and the projects contribute knowledge to the field. From 2022 these are $6,000 which goes directly to the students as a 10-week stipend.

**Jack Thomson Bequest –** research into the problems and treatment of arthritis.

**Laurenson Bequest –** research into the effects of proper diet and/or drugs on human health.

You can read about recent research projects funded in the Scientific Committee report on page 13.

## ALLOCATING FUNDS:

All medical researchers are passionate about their work, so to be certain our funding is distributed wisely we have a committee of scientific experts to oversee the process.

The Foundation's Scientific Committee reviews all annual grant and scholarship student projects through rigorous application rounds, choosing the very best each year.

Funding excellent projects and scholarships ensures that students and researchers are able to work in Otago, helping build our community along with focused research outcomes.

## YOUR SUPPORT MAKES A DIFFERENCE

Every one of us has family members and friends who have experienced the benefits of improved health from medical research. We need your help to build our understanding of a wide variety of medical conditions, leading to better diagnosis and treatment for all of us.

**To donate please go to our website www.omrf.org.nz or donate directly to our ANZ bank account 01 0815 0104572 00**

## BEQUESTS

Many people make gifts to charitable causes throughout their life. If you wish to contribute beyond your own lifetime in a way that creates meaning for future generations, you could make a bequest.

A legacy gift in your will is a great way to ensure your generosity benefits others for years to come. By gifting some of your estate to the OMRF, you will be creating a legacy of support for medical research.

"Every person's journey is different, but if you're looking for a practical way to give back and fight the impact of these diseases on individuals and families, the bequest option is a good choice." - *OMRF donor.*

*Medical research is a life changer.*
*Our supporters are life changers.*

# CHAIRPERSON'S REPORT

**2022 GRANTS TOTALLED**
**$434,414**

**TOTAL AMOUNT FUNDED***
**$10,887,614**
*Since the Foundation's inception

## It is with pleasure that I present the 54th Annual Report on the Otago Medical Research Foundation's activities for the 2022 financial year.

During the year under review, the Foundation approved Grants totalling $434,414, a decrease of $183,080 on last year's total of $617,494 (which was higher than usual because of one-off expenditure from reserves on three Covid-19 special grants totalling $74,251). Since the Foundation's inception, a total of $10,887,614 has been spent on medical research in Otago.

The extract from the Financial Statements, as published elsewhere in the Annual Report, shows a Deficit for the year of $180,441 compared with a deficit for the previous year of $369,131, which is $188,690 better than last year. Total Operating Income (Donations, Bequests, Subscriptions and Investment Income) decreased by $95,601 while Expenses decreased by $101,211 and Grant expenditure decreased by $183,080. Last year's income included a realised gain of $57,580 on sale of Investments while in the current year there was a gain of $5,353 on disposal of Investments. It would be good to see an increase in the receipt of further injections of capital for investment, which would to counter the reduced investment rates that we earn on our conservatively invested funds.

The Investment Sub-Committee has continued to face the challenge of finding suitable low risk investments while acknowledging that income and growth are also important. The reinvestment of maturing fixed interest investments remains a major challenge, although it is starting to improve again. It is pleasing to report that at balance date, the market value of our Company Securities and Shares shows an unrealised gain on cost of $1,384,215, which is 64% of cost.

At 31 March, 2022, Accumulated General Funds has a Deficit of $70,820 and Accumulated Special Funds a Surplus of $4,736,094 yielding a total of $4,665,274, both these figures comprising Capital and Income.

This year marked the 25th year in which the Otago Community Trust has awarded an Annual Grant to the Foundation with the details of grants awarded from this year's funding being published in the Scientific Committee Report. This brings the total grants received from the Otago Community Trust to $1,791,000 a truly generous contribution. On behalf of all members of the Foundation and all Researchers based in Dunedin I would like to sincerely thank the Otago Community Trust for their very generous, and much needed, contributions over the 25 years.

The Foundation is deeply indebted to those people who have named the Foundation as a beneficiary in their wills. Medical research is a never-ending activity, and the role of the Foundation will continue as long as there are medical scientists willing to ask critical questions and people willing to help fund these researchers in their quest for the vital answers. I would ask members to consider the Foundation when preparing their wills. A bequest to the Foundation will be effectively used and your influence will be felt beyond your lifetime.

## COUNCIL MEMBERSHIP

Changes in Council since the 2021 Annual Report are as follows:

Ex-officio Members Professor Brian Hyland, as Dean of the Otago School of Biomedical Sciences, and Professor Rathan Subramaniam, as Dean of the Dunedin School of Medicine, both stepped away from their approximately two-year roles in early 2022 and late 2021 respectively. We thank them for their well-considered contributions to Council discussions and welcomed the replacement for the School of Biomedical Sciences, Professor Neil Gemmell, in March 2022 and will be welcoming the Dunedin School of Medicine replacement, Professor Jo Baxter, in September 2022.

Appointed Member Nigel Miller, representing the Southern District Health Board, retired from Dunedin Hospital in the latter part of 2021 and, given the Government's restructuring of the country's DHBs, a replacement has not yet been sought.

In the Chair's 2021 Annual Report I was remiss in not acknowledging Appointed Member Dr Sarah Baird's active contribution to Council for 2019 and 2020 as the President of the Otago Medical School Research Society and in not welcoming her replacement, Associate Professor Gisela Sole, for 2021 and 2022. Similarly overlooked was that the Appointed Member positions representing the NZ Medical

Association (Otago Division) and Otago University Faculty of Medicine had ceased to be filled and I thank, respectively, Dr Peter Gootjes and Professor Andre van Rij for their active participation in Council in the many years prior to their departure.

## HONORARY LIFE MEMBERSHIP

I am delighted to report that at the December 2021 Council meeting, Council agreed to bestow honorary life membership on KEN DEMPSTER and Professor ROB WALKER, each for almost 30 years of very active involvement in the work of the Otago Medical Research Foundation. However, the intention to announce these accolades at the 2022 annual Gala was thwarted by Covid-19 restrictions.

Ken was part of the secretariat team from Deloitte from the late 1980s and was entrusted with Council minute-taking in October 1993 until his election as a Council member in 2008. He then took on the role of Chair of Council from 2011 to early 2021. His many achievements and stewardship of the Foundation are clear for all to read in past OMRF Annual Reports.

Rob's contribution is via the OMRF Scientific Committee to which he was co-opted at the end of 1992 and on which he continues to serve, providing strong clinical insight and pre-clinical knowledge to the assessment of research grant applications. He is also adept as an advocate to the general public of the importance of the Foundation's support for pre-clinical and clinical research and the nexus between them. Rob's own research (kidney disease), some of it funded by the Foundation, featured in the 2016 Annual Report and does so again on page 10.

## SIGNIFICANT ACHIEVEMENTS

At the end of 2020 Council updated its Investment Policy and ensured that in future investments would not be made in companies that have direct or primary revenue exposure in excess of 10% from unethical activities that would not align with the objectives of the Foundation. Activities that should be avoided include the following: alcohol production, tobacco production, weapons/armaments production, gambling, mining of fossil fuels, nuclear power, and adult entertainment. In addition, concerns around environmental impact, social impact and governance practices of companies would be considered on a case-by-case basis. Any 2020 current investments that did not conform would be divested of as soon as was practically possible. I am pleased to report that in early 2022 we now adhere to our ethical investment policy.

In July 2021 the Foundation became a signatory to the ANZCCART Openness Agreement on Animal Research and Teaching in New Zealand – see the Scientific Committee Report on page 13.

## THANKS

Firstly, to all those Trusts, Companies, Individuals, Members and Non–Members listed in this Annual Report who have supported the Foundation in the year under review. The Foundation is very grateful that it has continued to receive the support that it has in these continuing difficult economic and troubling times.

To the Foundation's Director of Development, Susan Sims, and the Foundation's Event Manager, Sarah Rickerby, my sincere and grateful thanks. Susan and Sarah are the faces and voices of the Foundation and their efforts in maintaining the profile of the Foundation during the Covid-19 restrictions (coupled with its effect on cancelling sponsorship events and making face-to-face meetings with current and potential sponsors impossible) are commendable and much appreciated. Susan's report can be found on page 9 and Sarah's report on page 23.

To the Scientific Committee and their dedicated Chairperson, Professor Greg Jones, and Deputy Chairperson, Dr Heather Cunliffe, for the many long hours spent on the assessment of and advice on grant applications to ensure a transparent and robust process which ensures the Foundation's funds are used in the best possible way. Thank you; your efforts are really appreciated. Without you all, we would not be able to achieve the object of the Foundation: "The Furtherance of Medical Research in Otago".

To all Council Members, and our Patron, Emeritus Professor Gil Barbezat, for your contribution and support, my sincere thanks for your continued interest in, and work done, for the Foundation. Council Meetings were held on 13 July 2021, 12 Oct 2021, 7 Dec 2021, and 22 March 2022.

To the Investment Sub-Committee members, Judy Bevin, Michael Milne and Jamie Adamson, for their wise counsel, advice and time so willingly given to serve on this Sub-Committee, I thank you most sincerely.

To the Deloitte team of Jamie Anderson, Nathan Lee and Trudy Corbett for continuing to provide very professional, friendly and efficient administrative services for the Foundation. Jamie and Nathan are the face of Deloitte for Council while Trudy works quietly in the background, ensuring that the Foundation's day-to-day requirements are attended to in a timely and professional manner which is very much appreciated.

To my fellow members of the Executive, Greg Jones and Jamie Adamson, who meet monthly, and with the Director of Development and the Events Manager, to keep things progressing in between Council meetings and scope new initiatives, my grateful thanks.

On behalf of the Council,

**Emeritus Professor Pat Cragg**
*Chairperson*

# THE OTAGO MEDICAL RESEARCH FOUNDATION COUNCIL

## PATRON

**Emeritus Prof G Barbezat**

## EX OFFICIO MEMBERS

**Prof G Jones**
Chairperson of Scientific Committee

**Mr J Adamson**
Deloitte (Secretaries)

**Prof R Subramaniam** (To December 2021)
Dean Dunedin School of Medicine

**Prof J Baxter** (From July 2022)
Dean Dunedin School of Medicine

**Prof B Hyland** (To December 2021)
Dean Otago School of Biomedical Sciences

**Prof N Gemmell** (From March 2022)
Dean Otago School of Biomedical Sciences

**Prof L Matisoo-Smith** (From July 2022)
Acting Dean Otago School of Biomedical Sciences

**Dr H Cunliffe**
Deputy Chairperson of Scientific Committee

## APPOINTED MEMBERS

**Dr N Millar** (To October 2021)
Southern District Health Board

**Assoc Prof Gisela Sole**
President of the Otago Medical School Research Society

## ELECTED MEMBERS

**Mrs J Bevin**

**Dr M Coleman**

**Emeritus Prof P Cragg**

**Mrs S Knowles**

**Mr M Milne**

## EXECUTIVE

**Emeritus Prof P Cragg**
Chairperson

**Prof G Jones**
Deputy Chairperson

**J Adamson**
Deloitte representative/Secretary/Treasurer

## DIRECTOR OF DEVELOPMENT

**Ms S Sims**

## EVENT MANAGER

**Ms S Rickerby**

## SECRETARIES

**Deloitte**

## HONORARY SOLICITOR

**Mr J Anderson** (Gallaway Cook Allan)

## AUDITORS

**Crowe**

# BEHIND THE FOUNDATION

# MICHAEL MILNE

## CRAIGS INVESTMENT PARTNERS

**The Otago Medical Research Foundation takes its investment advice from Craigs Investment Partners, but the relationship is much more than administrative.**

Michael Milne, an investment advisor with Craigs Investment Partners, is on the Foundation's Council. Michael and his predecessor have provided on-going and invaluable financial advance. Craigs Investment Partners is one of New Zealand's largest investment advisory firms, offering tailored investment solutions to private, corporate and institutional clients.

Michael has also been overseeing the recently revised ethical investment policy, to ensure that the investment focus takes the Foundation's ethical code into account. This means not only helping to develop the policy but looking at how to implement it.

"As a client, we help the Foundation to manage their money and make the most of what they have to fund current and future research, and we report to council on the investment portfolio."

"As a council member, I'm pleased to be able to offer my financial expertise to the mix."

"I enjoy seeing that what we are doing is helping research ideas get off the ground. Without that support, these small endeavours would not grow into larger projects that can attract more funding, and we would not have the benefits that then comes from our medical research."

The Craigs Investment Partners team places great value on their corporate responsibility and are committed to supporting the communities in which they operate, hence the support for local charitable organisations like the Otago Medical Research Foundation.

Michael has noted interesting parallels between the work Craigs Investment Partners do in the commercial world with start-up companies, and the research projects funded by the Foundation – both need that seed funding and support in the early stages to get up and running. "It's having faith in what can be achieved.".

"I love hearing and reading about those different health projects we have supported and their successes; the variety and the impact is fascinating and inspiring. We have a significant pool of talented and intelligent researchers right here in Dunedin."

"As a business, we help people to manage their financial wealth, but there is a common saying that your health is your wealth which I think is so true. We all benefit from medical advances, so I see the Foundation as being a great cause to support."

> "I enjoy seeing that what we are doing is helping research ideas get off the ground. Without that support, these small endeavours would not grow into larger projects."
>
> **MICHAEL MILNE**

# OTAGO MEDICAL RESEARCH FOUNDATION MEMBERSHIP

## ORDINARY MEMBERS

Prof W C Abraham

**Ashburn Hall Charitable Trust***

Emeritus Prof G Barbezat

Mr J Burton

**Dr S O Chin***

Dr J I Clayton

Dr A Cook

Mr M Farry

Prof M Hibma

Mrs L Homersham

Prof I L Lamont

Emeritus Prof J G Mortimer

Ms J O'Rourke

Emeritus Prof D.C.G. Skegg

Dr W Sutherland

Dr & Mrs G P White

Assoc Prof S Wilbanks

**Mrs S M Wilkinson***

* *Indicates Founding Member*

## RESEARCH PATRONS

Hope & Sons Limited

## LIFE MEMBERS

Mrs J Callon

Cerebos Gregg's Ltd

Mr P Chronican

Ciba-Geigy New Zealand Ltd

Mr S Davie

Donaghys Ltd

Dunedin City Council

Farra Engineering Ltd

Mr & Mrs H Fraser

Dr C M Goodall

Healthcare Otago Ltd

Dr R S Henderson

Janssen-Cilag Pty Ltd

Mr R Lewis

Lions Club Dunedin South

Ms S Mackinlay

Marsh Family Trust

Mr D Marsh

Mrs E Marsh

Mr G J Marsh

Mr W J Marsh

Dr J A McMahon

Mondelez New Zealand

Northern Southland Transport Holdings Ltd

Schering NZ Ltd

Roche Products (New Zealand) Ltd

St Margaret's College Council

Mr I A Thomson

Mr H R Wilson & Mrs N Ellis

## HONORARY LIFE MEMBERS

Mr G T Adams

Mrs E Brown

Emeritus Prof P A Cragg

Mr K G Dempster

Mr P C L Gibson

Prof J I Mann

Rotary Club of Dunedin South

Rotary Club of St Kilda

Dr C N A & Mrs J Trotman

Prof R J Walker

# FUNDS RECEIVED


## *Community Grants and Donations*

$304,076

## *Events*

$66,652


## *Bequests*

$7,533

### DONATIONS:

A Bullard
ACE Shacklock CT
Alister Sneddon
Caversham Pharmacy
DP & HD White
Dr S O Chin
I L Lamont
J Adamson
J Burton
K Cowie
K Dempster
M Ballantyne
P Murrell
P Suthisrisinipa
R & J Reid
S Sims
S Wilkinson
Specsavers Dunedin
T Scott

### GRANTS:

A Goulding
ADEPT-MACTODD Charitable Trust
Aotea Group Holdings Limited
Aotearoa Gaming Trust
Deloitte Dunedin
EMM Haynes Charitable Trust
Grand Casino Dunedin
JAD Iverach Memorial Fund
Kingston Sedgefield Trust
Lions Club of Dunedin South
Margaret Begg Charitable Trust
Otago Southland Diabetes Research Trust
Perpetual Guardian Foundation McGillvray Brothers
Rosey McConnon
The Healthcare Otago Charitable Trust
The Otago Community Trust
The Stonelake Foundation
William Downie Stewart Charitable Trust

### BEQUESTS:

Ethel Johnston Charitable Trust

# A REPORT FROM THE DIRECTOR OF DEVELOPMENT

## The Foundation exists to further medical research in Otago, supporting our local researchers in their innovative work.

Each year we fund annual grant projects; two major bequest project rounds; and for last summer 23 student research scholarships were funded. These scholarships allow the students to work in a lab on a research project through the summer and are highly sought after with 140 applications received for 2021/2022. The students funded often go on to be researchers and clinicians, so we help ensure the future of medical research in our community is bright.

The COVID-19 global pandemic continued its impact on all of us into mid-2022. For the Foundation it has meant somewhat lower available funding, particularly from events. We have been unable to hold our full roster of events, and a number of our funders have not been able to support us as they would have liked with the level changes and lockdowns affecting their business also. We are extremely grateful to all who have continued their support, and who have told us they will do so again in the future.

The Scientific Committee, headed by Professor Greg Jones, assesses each and every application for research funding and scholarships, and selects the very best to ensure that the Foundation is supporting the students, researchers and innovative projects which will have genuine impact. I am very grateful for all the work of the committee.

My sincere thanks to the OMRF Council, a committed group of highly skilled governance experts chaired by Emeritus Professor Pat Cragg, who bring a variety of business and academic skills to the OMRF table, and to Sarah Rickerby, our Events Manager.

I want to acknowledge the excellent support provided by Deloitte, particularly Jamie Adamson who also serves on the Foundation Executive; considered portfolio management by Craigs Investment Partners, who ensure our financial position is healthy; and Crowe Horwath, our auditors. Thanks to Walsh & Beck who do great work on our website, collateral and social media accounts.

To finish, I'd like to thank the individuals, families and trusts for the financial support you give the Otago Medical Research Foundation. With demand for funding increasing for both our scholarships of $6,000 and annual grants of up to $40,000, all donations are gratefully received as they add to our ability to help fund research undertaken here in Otago. The genuine interest you take in our work is very heartening and your ongoing generosity is humbling, the researchers truly couldn't do their important, innovative work without you.

**Susan Sims**
*Director of Development*

# OMRF RESEARCHER AND SUPPORTER PROFILES

## RESEARCHER SPOTLIGHT

## PROFESSOR ROB WALKER

**The support Professor Rob Walker's research has received from the Otago Medical Research Foundation over several decades has had an impact on understanding and managing kidney disease across the globe.**

Professor Walker is interested in how individuals with impaired kidney function handle medication. His research has focused on the effect of a range of prescribed drugs on kidney function - how some medications may lead to progressive kidney injury, or how impaired kidney function alters the way in which the body clears different medications.

He has also been involved in supporting other researcher's projects as a member of the Foundation's scientific committee for many years.

The Foundation has funded several of his research projects investigating the effects of lithium – a drug which successfully treats mood disorders but can alter how the kidney concentrates urine, and longer-term may induce a slowly progressive decline in kidney function.

Earlier translational research at the University of Otago looked at lithium-induced alterations in kidney-concentrating ability, asking what changes can occur following lithium exposure. Subsequent studies have focused on the pathways associated with the development of scarring (chronic interstitial fibrosis) following lithium exposure.

The focus was on differentiating normal cell activity and pathways that result in chronic injury. The impact of amiloride (an old diuretic drug) was shown to significantly reduce lithium-induced injury, offering potential for a new therapeutic agent to reduce the progression of chronic kidney injury.

These results were published in the Nature journal Scientific Reports.

**Managing medications with impaired kidney function**

Most medications are trialled in individuals with normal kidney function before they enter clinical practice. Less is known about how these medications react in individuals with impaired kidney function.

A focus of Professor Walker's investigations with the support of the Foundation has been to look at how some of these medications are handled with impaired kidney function. He has examined how various prescription drugs, including antibiotics, are handled and eliminated in the setting of impaired kidney function or by haemodialysis or peritoneal dialysis (used to manage individuals with kidney failure).

> "The Foundation gets so many high quality proposals - it makes funding decisions a constant challenge. But without their vital "seed" support, many researchers would simply not get their projects off the ground."

His most recent research looked at how allopurinol, a drug used to treat gout, is cleared in kidney patients receiving peritoneal dialysis – the aim being to quantify the impact of dialysis on drug handling which in turn will lead to safe prescribing of allopurinol.

The objective is guiding clinicians on drug prescribing appropriate for individuals suffering from kidney disease with an individualised treatment that addresses patient safety as well as efficacy.

**The benefits of Otago Medical Research Foundation funding**

All of Professor Walker's OMRF-sponsored projects are on a smaller-scale but together have added up to a significant understanding of kidney function – the Dunedin research published in leading peer-reviewed journals (with acknowledgement of the sponsorship from the OMRF), contributing substantially to world knowledge on kidney health.

Many of Professor Walker's projects have been an important means to getting Dunedin's medical students and trainees involved in clinical studies, providing them with valuable research and analysis skills as part of their training.

He points out that many of the OMRF-sponsored studies (not just his studies) provide the necessary data and proof of concept enabling applications to other funders such as Health Research Council for larger-scale studies to come up with scientific advances that can be published in prestigious journals and shared with the global community.

"The Foundation gets so many high quality proposals - it makes funding decisions a constant challenge. But without their vital "seed" support, many researchers would simply not get their projects off the ground."

**SUPPORTER SPOTLIGHT**

## AOTEA GROUP HOLDINGS

Our sponsorship is actively assisting in something that makes a difference, and that makes us feel like we can have some positive influence on the world around us.

That's how Aotea Group Holdings CEO Paul Parsons sees the sponsorship money it provides the Otago Medical Research Foundation.

The funding was a deliberate move by the holding company when it was first formed, as a meaningful way of paying back.

Aotea has been around for many years but is now a holding company and the largest electrical contracting company in New Zealand, employing 1300 staff, with 250 apprentices.

"We have businesses in every province, and each local business supports a wide range of things important to them including sport teams and local communities. That still continues, but what we wanted to do when Aotea Group Holdings came together in 2010 was something on a national scale and something that was significant.

"The funding was a deliberate move by the holding company when it was first formed, as a meaningful way of paying back."

Our board debated various charities but realised supporting research into health was something that could provide cumulative value over many years as small projects grew into significant research and their results make the way into health care.

"Our board debated various charities but realised supporting research into health was something that could provide cumulative value over many years as small projects grew into significant research and their results make the way into health care."

Our shareholders appreciate that we're supporting the Otago Medical Research Foundation, and medical research foundations in Auckland and Canterbury, in a time that is tough for not-for-profit organisations – even a small amount over time adds up.

"Even saving one life and saving the grief for one family would make a difference, but potentially our investment is saving lots of lives."

There is also value for Paul in hearing about the research – it's not just handing money over, its understanding where it is going.

"Finding out about each researcher's work – what they are doing and why, what problems they are wanting to solve – is rewarding. It's stimulating for us to find out about things that we otherwise know nothing about – including some really ground-breaking research. And we're active in that process, we're part of their innovation and discovery."

"We're proud to be part of that innovation, and of the future of medicine."

In a similar way, Paul sees his company as also being incubators; bringing together electrical and wiring services alongside energy advisory, all of which allow businesses to get off the ground. "We understand the importance of idea incubation."

Paul and his work colleagues enjoy making it to the Foundation's events and luncheons, bringing their clients along also to showcase the fundraising work being done.

"We're proud to be part of that innovation, and of the future of medicine."

# FUNDING DISTRIBUTION

*Scholarships, grants, trust grants, and Jack Thomson grants*

## SUMMER RESEARCH SCHOLARSHIPS

Antibiotic Resistance
**$5,000**

Bowel Cancer
**$10,000**

Brain
**$5,000**

Brain/ Elderly
**$5,000**

Breast Cancer
**$6,000**

Cancer
**$5,000**

COVID-19
**$5,000**

Diabetes
**$5,000**

Genes/Cells
**$10,000**

Hearing
**$5,000**

Immunity/
Microbiology
**$10,000**

Mental Health
**$31,000**

Oral health
**$5,000**

Paediatrics
/Epilepsy
**$5,000**

Spine
**$5,000**

## ANNUAL GRANTS

Breast Cancer
**$40,000**

Cancer
**$63,000**

Heart Disease
**$40,000**

Antibiotic Resistance
**$40,000**

## OTAGO COMMUNITY TRUST

Breast Cancer
**$27,000**

Infant Health
**$20,000**

Rural Health
**$38,000**

## JACK THOMSON BEQUEST

Arthritis
**$40,000**

Funding distributed financial year ending March 2022

# SCIENTIFIC COMMITTEE REPORT

## *1 July 2021 to 30 June 2022*

## 1. MEMBERSHIP

**Chair: Professor Greg Jones,**

**Deputy Chair: Dr Heather Cunliffe** (Co-opted)

**Associate Professor Hesham Al-Sallami** (Co-opted)

**Dr Sarah Baird**
(Nominee Otago Medical School Research Society)

**Dr Sierra Beck** (Nominee Dunedin School of Medicine)

**Associate Professor Chris Brown** (Co-opted)

**Dr Cathy Chapple** (Co-opted)

**Dr Tanya Cully** (Co-opted)

**Dr Nick Heng** (Co-opted)

**Associate Professor Rajesh Katare**
(Nominee of the Otago School of Biomedical Sciences)

**Dr Xochitl Morgan** (Co-opted)

**Associate Professor Ivan Sammut** (Co-opted)

**Associate Professor Gisela Sole**
(President OMSRS, *ex officio*)

**Professor Rob Walker** (Co-opted)

**Associate Professor Joanna Williams** (Co-opted)

**Associate Professor Stephanie Woodley**
(Nominee Otago Medical School Research Society)

The Scientific Committee is primarily concerned with adjudicating on applications for Research Grants and on applications from students for Summer Research Scholarships. To cover the breadth of topics submitted, the committee is relatively large to ensure it has representatives from all the major sub-disciplines of medical research.

The Scientific Committee farewelled Dr Xochitl Morgan at the start of 2022. The Foundation thanks Xochitl for her contributions to the Committee.

***Note:*** *Most, but not all research projects, have protocols that require approval by the appropriate Ethics or Safety Committee prior to commencement of the research. Agreement by the Foundation to fund research projects is thus subject to receipt by the Chair of the Scientific Committee of a letter from the University of Otago's Animal Ethics Committee, Human Ethics Committee or Human Ethics Committee (Health) (or the Ethics Committee of a Health Funding Authority) indicating that the research has received full ethical approval. Work involving genetically modified organisms requires evidence of approval from ERMA or from the University of Otago's Institutional Biological Safety Committee.*

*The Otago Medical Research Foundation has committed to openness on the use of animals in health research by becoming a signatory of The Openness Agreement on Animal Research and Teaching in New Zealand https://anzccart.org.nz/business-consultancy-on-the-edge/openness-agreement. The Foundation recognises the important contribution that animal research has made to the advancement of modern medicine. Some of the research projects funded by the Foundation may involve animals and we are committed to only supporting studies that maintain high standards of animal welfare and adhere to the ethical tenants of refinement, reduction and replacement.*

> The scientific activities of the Foundation (advertising of up-coming grants and listings of awards) can be found on www.omrf.org.nz

## 2. SUMMER RESEARCH SCHOLARSHIPS 2021/2022

One hundred and forty applications (compared with 179 in the previous year) for an OMRF summer research scholarship were received from the University of Otago in late August 2021, of which 23 (compared to 21 in the previous year) were recommended for funding by the OMRF. Of the 23 students funded by the OMRF, 13 were studying at the School of Biomedical Sciences, 2 at the Dunedin School of Medicine, 1 at the Faculty of Dentistry, 2 at the School of Pharmacy and 4 at the Division of Sciences. It should be noted that the ten-week summer research is not part of the study required in a student's tertiary qualification and any data obtained during the summer research cannot contribute to the dissertation or thesis of such a qualification.

Each OMRF scholarship was worth $5,000 except for the two students with the highest scores who were awarded named Summer Research Scholarships ($6,000) – named in honour of the late Allan Wilkinson and the late Emeritus Professor Garth McQueen. Allan was Secretary of the Foundation from its inception in 1967 until his retirement in 1993 and Garth was a foundation member of the Foundation and one of the instigators of the formation of the Foundation's Auxiliary.

Due to the continuing sponsorship drive of the OMRF, the other OMRF scholarships were funded by: Grand Casino;

EMM Haynes Charitable Trust; Stonelake Foundation; Dr Ailsa Goulding; Kingston Sedgfield Trust; Marion Rhodes Memorial; Walsh & Beck; Healthcare Otago Charitable Trust; Deloitte Dunedin; OMRF Wilkinson; OMRF McQueen; OMRF Iverach; Otago Southland Diabetes Research Trust Scholar (administered by Perpetual Guardian); Aotearoa Gaming Trust; C&E Matheson; Perpetual Medical Services Charitable Trust (Lions Club of Dunedin South); Rosey McConnon; and The Perpetual Guardian Foundation's McGillvray Brothers Scholarships. The involvement of Otago commercial companies and the Otago community for a tenth year in supporting summer research by tertiary students is very much appreciated.

The OMRF summer research scholars also attended a very successful two-day workshop in Science Communication, run specifically for the OMRF by the University of Otago's Centre for Science Communication. One outcome of the workshop was the production of short videos about each research project, which can be accessed via the OMRF web site: **www.omrf.org.nz**

All scholars returned good to excellent reports at the end of February 2022. The Renshaw Prize ($250) for the best report was awarded this year to **Sarah Barber** who worked under the guidance of Associate Professor Anita Dunbier in the Department of Biochemistry, University of Otago.

The following is a list of the summer scholars and summaries of the projects undertaken – additional information on these projects can be obtained from the Chair of the OMRF Scientific Committee or from the supervisor concerned.

## SARAH BARBER

Supervisor: Assoc. Prof. Anita Dunbier, Department of Biochemistry

*Renshaw Prize Winner for the best OMRF summer research scholar report*

### PROJECT: Induction of cell death promoting an immune response in oestrogen receptor positive breast cancer

*Funder: Otago Medical Research Foundation - McQueen*

**ABSTRACT:** Breast cancer is the most diagnosed cancer around the world and >70% of breast cancers are positive for the estrogen receptor (ER+). Despite current chemotherapy and endocrine therapy treatments against this breast cancer subtype, a large fraction of people still show resistance, outlining the need for improved treatment strategies. Immunogenic cell death (ICD) is a special type of cell death which induces an immune response that brings more immune cells into the area. ICD of cancer cells has the potential to improve treatment responses and lower the number of people that show resistance, however this has not been trialed in ER+ breast cancer. This study found that ivermectin caused over 93% of treated cells to undergo ICD; significantly higher than doxorubicin, a current ER+ breast cancer therapy. This shows potential for ivermectin to be used as a future treatment to decrease tumour size and decrease the chance of recurrence.

# RENSHAW PRIZE WINNERS

***The Renshaw Prize is named after one of the founders of the Otago Medical Research Foundation Inc., the late Dr P.K. Renshaw. The prize of $250 is awarded to the Summer Research Student, who in the opinion of the Scientific Committee, amongst the Research Scholars supported, has made the most worthwhile contribution to medical research in that particular year.***

***In recognition of their contribution, prize winners' names are listed below:***

1970 - Mr A.G. Yule
1971 - Mr K.J. Davey
1972 - Mr F.M. Patrick
1973 - no award
1974 - Mr J.C. Montgomery
1975 - Mr A.S. McLean
1976 - Mr N.K. Given
1977 - Miss F.M.F. McQueen
1978 - Mr K.D. Jolly and Mr J.P. Scott
1979 - Mr R.A. Henderson
1980 - Mr D.W. MacFarlane and Mr D.W. Shaw
1981 - Mr N.E. Dickson and Mr Wong Ooi
1982 - Miss C. Page
1983 - Mr I.L. McLean
1984 - Mr I.L. McLean
1985 - Miss B.C. Galland
1986 - Mr R.G. Snell
1987 - Mrs T.E. Inder
1988 - Miss M. Kuipers
1989 - Miss E.R. Dennett
1990 - Miss A. Charlton
1991 - Mr B. McKenzi
1992 - Mr J.W. Corboy
1993 - Ms S.M. Dillon
1994 - Ms N. Dalbeth
1995 - Mr T. Zaharic
1996 - Mr M. Morrison
1997 - Mr A. Brown and Ms S. Safari
1998 - Mr J. Magnum
1999 - Ms J. Pitchforth and Ms A. Steyn
2000 - Mr J. Wales
2001 - Mr M. Rahimi
2002 - Ms S. Jordan
2003 - Ms E. Szymlek-Gay
2004 - Mr D. Kieser
2005 - Mr C. Young
2006 - Mr C. Young
2007 - Mr S. Smart
2008 - Ms S. Saunderson
2009 - Ms J. Lee and Ms E. Winsley
2010 - Mr J. Zhang
2011 - Miss E. Gavey, Mr E. Ottley, and Mr W. Parkyn
2012 - Miss Su Zhou
2013 - Nr Fly Ing-Aram
2014 - Katie Hoeksema and Deepa Mistry
2015 - Alice McSweeney
2016 - Nigaah Khan and Isabelle van Hout
2017 - Sashika Samaranayaka
2018 - Simone Thomas
2019 - Eleni Hackwell
2020 - Nathan MacDonell
2021 - Ella Macbeth
2022 - Sarah Barber

## ALEX VAN DER WEERDEN

Supervisor: Dr Indranil Basak, Department of Biochemistry

### PROJECT: Studying batten disease in a dish

*Funder: C&E Matheson*

**ABSTRACT:** Batten disease is group of fatal genetic diseases that predominantly affect children. This project investigated how brain cells are affected in six different forms of Batten disease: CLN2, CLN3, CLN5, CLN6, CLN10, and CLN12. Human brain cells were grown in a dish mimicking each of these forms of Batten disease forms. We found that CLN2- and CLN3-Batten disease brain cells had disrupted cellular recycling machinery and appeared to have abnormal overall structure, which may contribute to causing these forms of Batten disease. A build-up of a specific toxic protein, which is common in Parkinson's disease, was also found in CLN2-Batten disease brain cells that has never been reported before. Our study has revealed key defects in the brain cells with Batten disease, which will contribute to the understanding of the brain cell pathologies in Batten disease that brings us closer to finding a cure.

## ALEX STEPHENSON

Supervisor: A/Prof Bruce Russell, School of Pharmacy

### PROJECT: Coding selection criteria to create experimental and control groups, for use in future research on psychiatric disorders

*Funder: Aotearoa Gaming Trust*

**ABSTRACT:** The UK Biobank contains information across many measures, including mental diagnoses, and drug history, information on magnetic resonance imaging (MRI) scans, and basic demographic information for around 500,000 participants in the UK. These data allows a unique opportunity to investigate the impact on certain drugs, and their unknown role in certain psychiatric disorders. However hand-selecting participants who are eligible for such studies is tedious, time-consuming and overwhelming for most computer systems. Therefore, I have written a coding pipeline using RStudio (a widely used statistical software), to filter the dataset of 500,000, into datasets which only contain those who have the psychiatric disorder of interest and/or drugs of interest. The code can be easily manipulated to swap out disorders or drugs, and also allows participants to be excluded from the study if they fall under certain conditions. The resultant smaller data can then be used for further statistical testing.

## AMABELLE VOICE-POWELL

Supervisor: Dr Mick Watt, Department of Anatomy

### PROJECT: Unmasking the connection between inflammation and anxiety

*Funder: Walsh & Beck*

**ABSTRACT:** Anxiety disorders are a leading cause of health loss in New Zealand. Anxiety disorders are linked to higher levels of inflammation in the brain, but exactly how inflammatory molecules alter brain circuitry to trigger anxiety is unclear. Proinflammatory cytokines are molecules that appear to decrease the level of the brain chemical serotonin, promoting anxious behaviour. A new research tool called optogenetics has allowed us to study the role of inflammation in anxiety disorders. Optogenetics involves shining coloured light into specific brain regions that have been infused with a light-responsive viral vector. This allows brain signalling pathways to be turned on/off in a controlled manner. Using optogenetics, this project has begun to investigate how proinflammatory cytokines are modulating the serotonin system to cause anxiety. We hope to unmask the link between inflammation and anxiety to find new treatments for anxiety disorders.

## ANITA LU

Supervisor: Prof Catherine Day, Department of Biochemistry

### PROJECT: Discovering how mutations of an immune regulator cause disease

*Funder: Kingston Sedgfield Charitable Trust*

**ABSTRACT:** Ring Finger protein 125 (RNF125) is a protein that tags other proteins for destruction. One target is Retinoic Acid-Inducible gene I (RIG-I), a protein that senses when a virus infects a cell. If a virus is present, RIG-I turns on the RIG-I pathway, resulting in an inflammatory immune response against the virus. When the virus is overcome, RNF125 destroys RIG-I to turn the pathway off. Defects in RNF125 have been found in patients with Tenorio syndrome, an overgrowth syndrome linked to autoimmunity. This project aimed to characterise the RIG-I pathway in cells with and without RNF125, then investigate how the defects in RNF125 affect the RIG-I pathway. This project began to develop a method to detect activation of the pathway by probing the level of RIG-I in cells. Although refinement is needed, it provides a starting point for investigation into defects in RNF125 and the effects on the pathway.

## BIANCA CRICHTON

Supervisor: Dr Jim Ross, Department of General Practice & Rural Health

### PROJECT: Evaluating health improvement practitioners in small practices

*Funder: Healthcare Otago Charitable Trust*

**ABSTRACT:** The Access and Choice programme (A+C) is a new approach to wellbeing within General Practice. The service uses a Health Improvement Practitioner (HIP), Health Coach (HC) and Community Support Worker (CSW), who work as a team to support those with mild and moderate mental health issues and/or long-term physical conditions. Many small and rural practices do not have the space, resources, or patient numbers to have A+C staff in the practice full time, therefore changes have to be made to the model to make it work in these contexts. This research maps out some of the different ways small and rural practices have adapted to these challenges, helping make the service work within their own contexts.

## CABRIANA EARL

Supervisor: A/Prof Caroline Beck, Department of Zoology

**PROJECT: A cautionary tale; the process of subcloning a toxic gene**

*Funder: Stonelake Foundation*

**ABSTRACT:** Rare disorders involving delays in brain development and with seizures called developmental and epileptic encephalopathies (DEE) may often be due to unique genetic mistakes in children who develop it. In this case, a four-year-old New Zealand patient with DEE had a unique mistake identified in DNA important for brain development. To find out whether this causes DEE, it was planned to inject a form of this mutation into African clawed frog embryos. Once grown into tadpoles, monitoring whether altered behaviour was seen could indicate whether the mistake is the cause of the DEE. However, preparing genetic material for injection into early frog embryos was more difficult than expected – this region of DNA was toxic to the bacteria that were needed for growing more of it. Through many attempts and alterations, this process was adapted to cope with the gene toxicity – meaning the likelihood of being prepared for injection was increased.

## CAITLYNN LOUISE ILLINGWORTH

Supervisor: Prof Paul Smith, Department of Pharmacology & Toxicology

**PROJECT: Do differences in how cells of our inner-ear produce energy relate to damaged produced by antibiotics?**

*Funder: Perpetual Medical Services Charitable Trust (Lions Club of Dunedin South)*

**ABSTRACT:** Aminoglycosides (AGs) were one of the first antibiotic classes replaced when safer forms were developed. However, with bacteria learning ways to avoid death by newer antibiotics, practitioners are opting to prescribe older drug generation. One consequence of this is deafness, which develops when AGs kill cells of our inner ears, however, how AGs select which part of the inner ear to damage isn't understood. This project aimed to understand whether differences in how parts of the inner ear produce energy determine what inner ear region the drug damages. To investigate this possibility, rats inner ears were dissected and kept alive outside of the animal. Two different antibodies labelling two energy pathways were used to examine how inner ear regions produced energy. Results indicate that energy production does not differ between inner ear systems, which would need confirming with further research. Such results will provide a foundation by which protective drugs can be developed.

"Such results will provide a foundation by which protective drugs can be developed. "

## CIARA WHITE

Supervisor: Prof Simon Stebbings, Department of Medicine

**PROJECT: Bertolotti Syndrome: An investigation of symptoms and effects on quality of life following a review of X-rays**

*Funder: OMRF Iverach*

**ABSTRACT:** Bertolotti syndrome is symptoms caused by an anatomical abnormality in the lower spine. The most common symptom is low back pain. It is not well understood and so can be mistaken for arthritis of the back. This project is investigating whether Bertolotti syndrome should be considered when clinicians are diagnosing inflammatory back pain. Participants were sent questionnaires assessing inflammatory back pain, pain severity and quality of life. Previous X-rays of the participants were reviewed to look for other unusual features in the lower back. The results found that many participants did show signs of inflammatory back pain and their pain was having a significant impact on them. Because of this, we conclude that Bertolotti syndrome should be considered when diagnosing inflammatory back pain.

## DANIEL VALLABHJEE

Supervisor: Prof Peter Fineran, Department of Microbiology & Immunology

**PROJECT: How non-coding RNAs regulate phage resistance in bacteria**

*Funder: Aotearoa Gaming Trust*

**ABSTRACT:** Rising antibiotic resistance in bacteria necessitates new antimicrobial approaches. One possibility are bacteriophages – viruses that specifically kill bacteria. However, bacteria have 'adaptive immune systems' called CRISPR-Cas, which can protect against phages. To understand when these 'immune systems' are active and therefore, how best to minimise their effect during phage-based antimicrobial approaches, we must know how CRISPR-Cas systems are controlled. Serratia species include opportunistic pathogens and the Fineran lab discovered that in one strain, CRISPR-Cas systems are regulated by Hfq. Hfq affects gene expression post-transcriptionally by helping small non-coding RNAs (sRNAs) bind and control target mRNAs. However, sRNAs that regulate CRISPR-Cas are unknown. In this project, to determine which sRNAs regulate CRISPR-Cas, I generated 96 plasmids that will enable the knockdown of >45 potential sRNAs using a CRISPRi-based gene-silencing method. In the future, these sRNA knockdown plasmids will be used to assess which sRNAs are involved in CRISPR-Cas regulation.

## DAVID BARCLAY

Supervisors: Prof Parry Guilford, Department of Biochemistry

**PROJECT: A new technology for liquid cancer biopsy**

*Funder: Marion Rhodes Memorial Scholarship-*

**ABSTRACT:** : Colorectal cancer is a blight on New Zealand, with significant discrepancies between Maori and NZ

European outcomes. Novel tests that allow tumour surveillance in an affordable and accurate manner are urgently needed, especially those that are accessible in rural areas. Circulating tumour DNA is a biomarker with potential to meet these criteria given it can be measured with a simple blood test. New techniques analysing methylation from Oxford Nanopore sequencing data are poised to overcome some limitations in this field. This study aimed to test this methodology in the hopes of improvements in clinical practice, especially in rural regions. Results were promising, with the new technology producing measurements which were consistent with previous techniques, but further study is required to move this from research to clinic.

## DIVYASHRI THAKKAR

Supervisor: Dr Martin Fronius, Department of Physiology

### PROJECT: The role of H441 cells in studying ENaC for COVID- 19

*Funder: Aotearoa Gaming Trust*

**ABSTRACT:** The recent novel coronavirus disease (COVID-19) outbreak is a worldwide emergency. With 203 million cases and 4.3 million deaths worldwide, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) remains a severe public health problem and will continue to be until effective and sustainable therapies are available. Recent studies evidence a correlation between COVID-19 symptoms and how sodium is managed by lung tissues via dysfunctional epithelial sodium channels (ENaC). In this project we investigated the function of ENaC in the lung and its potential contribution to lung fluid accumulation – a primary driver of COVID-19 related mortality and morbidity. We found a strong correlation between SARS-CoV-2 infection and ENaC dysfunction in lung cells. These results will give rise to more accessible and equitable treatment opportunities, reducing the global burden of this disease.

"These results will give rise to more accessible and equitable treatment opportunities, reducing the global burden of this disease."

## FLYNN BUTLER

Supervisor: Dr Bruce Mockett, Department of Psychology

### PROJECT: Altering brain cell function to control the production of a key protein in alzheimer's disease

*Funder: C&E Matheson*

**ABSTRACT:** The ability of brain cells to change is important for brain function. Making new proteins is at the core of this, but it may not be working properly in some diseases, including Alzheimer's Disease (AD). One protein is called sAPPα, and is formed by an enzyme called ADAM10. sAPPα is beneficial for the brain, so may be used to treat brain diseases. One possible way to do this is to activate brain cells to produce sAPPα, by activating a protein on the surface of brain cells called mGluR. This may release sAPPα from brain cells. In this project, using rat brain cells grown in a dish, we showed that a 30-min activation of mGluR induces sAPPα release, and that this release slows over time. These findings will inform future studies into the control of sAPPα release.

## FONG FU

Supervisor: Dr Erik Wibowo, Department of Anatomy

### PROJECT: Sexual management for men with erectile dysfunction

*Funder: Dr Ailsa Goulding*

**ABSTRACT:** The external penile prosthesis (EPP), or strap-on-dildo, is a sexual device men with erectile dysfunction (ED) can use for sexual intercourse, but there is insufficient information surrounding its use. I investigated ED patients' views, preferences, and willingness to use the EPP. 162 participants (92% experienced ED) completed an online survey. Their willingness to try EPP increased after being presented with more information about the rationale for using EPP. Participants preferred being introduced to EPP by either a sexual health therapist/ counsellor (27.2%) or a physician (25.3%). 47.5% thought the EPP should be introduced after men have tried more commonly recommended strategies (e.g., oral medication, penile injection, etc.). 36.4% preferred trying a customised (size/ colour) EPP. Younger age, shorter relationship duration, and more flexibility in approaching sexual issue were associated with more willingness to try the EPP. Overall, my data provides information on how the EPP may appropriately be presented to ED patients.

## HENRY WARD

Supervisor: Mark Thompson-Fawcett, Department of Surgical Sciences

### PROJECT: How patient demographics and surgical care influence the risk of death and returning cancer following surgical treatment of rectal cancer in South District Health Board area

*Funder: EMM Haynes Charitable Trust*

**ABSTRACT:** Colorectal cancer is a significant cause of death and suffering in our society and it is especially prevalent here in New Zealand. The purpose of this study is to identify aspects of patient demographics and care associated with the risk of death and of cancer returning after treatment. We analysed information about patients at the time of operation and surgical outcomes over a five-year period to identify associations between patient demographic and surgical care factors and the risk of death or recurrence. We found that only the stage of the disease (how advanced the cancer is) and the presence of a positive circumferential resection margin (a narrow area of tissue surrounding the tumour that is taken out) were significantly associated with cancer returning in another part of the body (distant recurrence) or death.

## JESSICA SEOW

Supervisor: A.Prof Sunyoung Ma, Department of Oral Rehabilitation

### PROJECT: Investigating the most efficient method of repairing fractured 3D-printed dentures

*Funder: Aotearoa Gaming Trust*

**ABSTRACT:** 3D printing presents improvements to the long and costly process of conventional denture manufacture. Nevertheless, 3D-printed dentures also experience fracture due to wear and tear. Therefore, it is important to find an efficient method for repairing them. In our study, 3D-printed denture resin samples were artificially aged and then sectioned to simulate a fracture after 12 months of clinical use. The flexural strength (FS) of the repaired samples after three types of surface treatment (bur roughening, sandblasting or chemical primer application) was then tested. Two groups were further artificially aged (simulating 12 and 24 months of use) to measure the long-term efficiency of each treatment. Mean FS of the bur-roughened samples decreased significantly after artificial ageing compared to immediately after repair. Bur roughening produced significantly higher FS than the sandblasted samples tested immediately after repair. However, this efficacy did not last throughout the additional 12 and 24 months of wear.

## LACHLAN DOBSON

Supervisor: Prof Alexander McLellan, Department of Microbiology & Immunology

### PROJECT: Growing a population of memory white blood cells

*Funder: Rosey McConnon*

**ABSTRACT:** Natural killer (NK) cells are a subset of white blood cells that provide a natural anti-tumour defence to the body with potential to be genetically manipulated and utilised in cancer treatments. NK cells activate and divide following exposure to cells expressing signalling molecules and secreting soluble growth factors (cytokines). During this growth phase, NK cells develop different physical characteristics based on cytokine exposure and antigen presenting cells presence. We tested if the presence of a molecule (peptide-beta2-microglobulin-HLAE-SCT) on antigen presenting cells would enhance the development of anti-tumour characteristics of NK cells, increasing their cancer-fighting abilities. Though we did observe changes consistent with our hypothesis, we found that this response was variable. These observations will aid future work is this field.

## OSCAR SERGEL-STRINGER

Supervisor: A.Prof Hesham Al-Sallami, School of Pharmacy

### PROJECT: Alcohol consumption in young adults with type one diabetes

*Funder: Otago Southland Diabetes Research Trust*

**ABSTRACT:** Type one diabetes is a chronic condition that is most diagnosed early in life – particularly in children and young adults. Many studies have shown that young adults are typically one of the age groups where individuals find it most difficult to control their condition. A factor in this is the introduction of alcohol, and specifically binge-drinking becomes apparent in this age group. Alcohol impacts diabetes by destabilising blood sugars, impairing awareness, and increasing the likelihood of potentially fatal complications such as hypoglycaemia. This interview-based study investigated young adults with type one diabetes who previously had consumed or currently consume alcohol, and ascertained their experiences, as well as their knowledge of potential harms, and how they alter their behaviour when drinking. The information gathered from this study provides new understanding for healthcare teams caring for these individuals about how guidelines and education may need to be altered to be more practicable.

## PHOEBE ALLAN

Supervisor: Prof Iain Lamont, Department of Biochemistry

### PROJECT: The ways the pathogen *P. aeruginosa* may be resisting antibiotic treatment

*Funder: EMM Haynes Charitable Trust*

**ABSTRACT:** *P. aeruginosa* is a pathogen that causes potentially fatal illness in people with weakened immune systems. One way *P. aeruginosa* resists treatment with antibiotics, such as ceftazidime, is by mutating their genomes. In this project mutations in two genes, *dacB* and *mpl* were analysed to determine if they are contributing to resistance to ceftazidime. It was found that a key resistance enzyme (AmpC) had increased activity in *P. aeruginosa* with a *mpl* mutation, suggesting that this may be the way this bacteria resists antibiotic treatment.

## MUHAMMAD SYIBRI SYAFIQ BIN MOHD FAHMI

Supervisor: Dr S. M. Shadli, Department of Psychology

### PROJECT: Towards developing a diagnostic test for TR anxiety and depression patients

*Funder: Perpetual Guardian Foundation's McGillvray Brothers*

**ABSTRACT:** Neurotic disorders (anxiety and depression), are the most prevalent mental disorders in New Zealand, USA and Europe. Anxiety and depression can be persistent and highly disabling. They can come with suicidal thoughts and suicide attempts. Anxiety and depression can have severe impacts both on society and costs to public health. But, currently available medications are ineffective in almost 35 to 40% anxious/depressed patients; making them treatment resistant (TR). Diagnosis is considered as the key problem of the TR scenario since weak diagnoses lead to weak treatment outcomes. We are currently working to develop a diagnostic tool to enable better diagnosis of anxiety disorders and so, better treatment outcome. In this summer studentship, we tested our already developed biomarker with TR anxiety and depression patients and found they also show positive biomarker responses.

## THERESA MATHESON-GRANT

Supervisor: Dr Karen Knapp, Department of Biochemistry

### PROJECT: Investigating the role of histones in brain development

*Funder: Grand Casino*

**ABSTRACT:** Histone H4 is a component of the nucleosome, which condenses DNA into chromatin, and is an essential protein in the cell. A novel neurodevelopmental disorder is caused by mutations in H4, which are thought to interfere with binding to histone H3 and histone chaperones (ASF1a, CHAF1a, MCM2, POLE3) that play essential roles in replication of DNA through their interactions with the nucleosome. This study investigated whether these key protein-protein interactions are disrupted by H4 mutations, which would both provide insight into what causes this disorder and further our understanding of the role histones play in brain development. We expressed mutant H4 in a human cell line and saw it was located in cell nuclei, where DNA is wrapped around nucleosomes. Interactions with histone chaperones were difficult to identify due to issues in the protocol we used, therefore further research is required.

## TITHI GANDHI

Supervisor: Dr Megan Wilson, Department of Anatomy

### PROJECT: DNA methylation and isoform gene expression during mouse sex determination

*Funder: Deloitte Dunedin*

**ABSTRACT:** Chemical changes to DNA (DNA Methylation) can change whether a gene is 'read' by a cell. The present project aimed to determine if sex-specific DNA methylation and sex-specific gene expression is observed in the male and female gonads during sex determination in mouse embryos. Three genes with roles during sex determination, associated with infertility and intersex conditions, having specific regions for DNA methylation and showing sex-specific expression of transcript isoforms (different forms of the same gene) were investigated – *Lefl*, *WT1* and *Emx2*. No sex-specific differences in their DNA methylation levels were observed in either male or female gonads. While sex-specific methylation and isoform expression was not observed, this project will inform the design of future studies in this field.

## VICKY HE

Supervisor: Dr Narun Pornpattananangkul, Department of Psychology

### PROJECT: Predicting major depressive disorder

*Funder: OMRF Wilkinson Scholarship*

**ABSTRACT:** Research discovered that "resting-state functional magnetic resonance imaging (re-fMRI) can be used to predict major depressive disorder (MDD). However, results have been inconsistent, possibly due to the small samples used in most studies, and the existence of different analysis methods. In this project, we aimed to compare classification performance among different methods using a large scale MDD dataset. We tested six quantification methods as well as four algorithms for analysing rs-fMRI data. We also tested if combining the quantification methods would boost classification performance. All methods we tried produced good results, and we found that using the amplitude of low frequency fluctuation to quantify rs-fMRI data resulted in the best performance. We also found that algorithms did not affect performance much, and the benefit of combining across quantification methods was not obvious, which might require further investigation.

# 3. RESEARCH GRANTS AWARDED

## (A) ANNUAL GRANTS AND OTAGO COMMUNITY TRUST GRANTS

These one-year grants are for research concerned with human health and the scientific basis of medicine. In June 2021 there were 31 applications from the University of Otago (compared with 22 in the previous year) totalling $982,087 and eight of these were funded at a total expenditure of $266,867 of which $80,000 was provided most generously by the Otago Community Trust. These grants commenced between August and October 2021 and are nearing completion with full reports due 3 months after the one-year grant ends. Abstracts from the final report will be available on the OMRF website **www.omrf.org.nz** at the end of 2022. The funded projects are summarised below:

### (I) ANNUAL GRANTS

### Associate Professor Rajesh Katare
(Department of Physiology , University of Otago)

#### Circulating microRNAs as prognostic indicator of ischemic heart disease

*Sponsored by ADEPT MACTODD Charitable Trust*

In patients with chronic heart disease, the transition from a clinically stable disease to an acute life-threatening event remains unpredictable. Echocardiography is used to determine changes in cardiac function that requires patients visiting a specialty centre, which is expensive and infrequent. Our on-going clinical study identified micromolecules released by the diseased heart into the circulation. We aim to complete the first five-year follow-up study to determine whether changes in the level of these circulating micromolecules correspond to changes in cardiac function, as measured by echocardiography. If these blood micromolecules indicate heart disease, patients can be tested frequently by their local doctor to monitor progression of disease and their response to treatment.

### Professor Roslyn Kemp
(Department of Microbiology & Immunology , University of Otago)

#### Exploring short chain fatty acids as immune modulators for cancer therapy

*Sponsored by Aotea Holdings Group*

The immune response is an important mechanism for destroying tumours. In cancer patients, a high number of T cells in the tumour is associated with positive patient outcomes, and immune therapies that improve T cell function have increased patient survival. The function of T cells, and T cell-mediated therapies, have been linked with microbial communities. Our research will focus on the molecules produced by bacteria, and how they can change T cell function. We will test whether the bacterial molecules can enhance T cell-mediated immune responses.

### Dr Magda Ratajska
(Department of Pathology, University of Otago)

#### BARD1: a valuable new marker to predict the outcome of triple-negative breast cancer patients

*Sponsored by Aotearoa Gaming Trust*

Drugs targeting specific mutations improve patients' outcome in several cancer types, including breast cancer. Women with triple-negative breast cancer (TNBC) do not express HER2 or estrogen/ progesterone receptors, therefore they are unable to benefit from hormonal or targeted therapy. However, TNBC is more common in patients with BRCA1 mutations and they respond well to PARP inhibitor drugs (PARPi). Patients with mutations in other genes, like BARD1, can also benefit from PARPi. Here, we will characterise TNBCs with BARD1 alterations and explore the molecular features associated with patient survival. This research might help in identifying the population of patients with the greatest potential benefit from PARP inhibitor.

### Dr Erin Macaulay
(Department of Pathology, University of Otago)

#### Repeating the past: a role for early developmental genes in malignancy

*Sponsored by Margaret Begg Charitable Trust*

Genes that promote life may also drive death. We have discovered a unique set of genes in melanoma (a dangerous skin cancer) that are also expressed in tissues of early human development. Our recent data show that these "early developmental" genes become reactivated in melanoma, and potentially other cancer types. Importantly, these genes are not expressed in any other healthy adult tissue, so we could target them specifically in the cancer cells. This would greatly reduce side effects for patients, because their healthy cells won't be affected. Therefore, these genes may be useful as new melanoma therapies, which are desperately needed in New Zealand.

### Professor Iain Lamont
(Department of Biochemistry , University of Otago)

#### How does lack of oxygen increase antibiotic resistance in *Pseudomonas aeruginosa*?

*Sponsored by OceanaGold*

*Pseudomonas aeruginosa* is an extremely problematic bacterial pathogen, causing a wide range of infections. Antibiotics often fail to eradicate the bacteria. During infections *P. aeruginosa* often exists under conditions where little or no oxygen is present. We think this is one reason why antibiotics don't work properly. In this research we will investigate how *Pseudomonas* tolerates a key antibiotic, tobramycin, in the absence of oxygen, and investigate the effects of oxygen deprivation on effectiveness of a second antibiotic, colistin. The research could lead to better tools for predicting which antibiotics will be effective in treating *Pseudomonas* infections, and for improved patient treatment through co-administration of oxygen with antibiotics.

### (II) OTAGO COMMUNITY TRUST GRANTS

*The Otago Community Trust supports biomedical research in the Otago area with the proviso that the research is selected on topics that can relate well to issues understandable by the layperson. The three projects selected were:*

#### Associate Professor Gabrielle Davie
(Department of Preventive and Social Medicine, University of Otago)

**Rurality, deprivation and ethnicity: their intersection and impact on health**

Unfair differences in health between socioeconomic and ethnic groups exist in NZ. It is currently less clear whether similar rural-urban differences exist and whether poor health outcomes can be explained by the socioeconomic and ethnic composition of rural areas. Obtaining clarity on this is essential to appropriately informing health policy, planning, and the delivery of health services in rural areas. Using a recently completed and robust method of classifying areas as rural or urban, this research will examine the overlap between ethnicity, socioeconomic deprivation and rurality and the influence that these factors have on health outcomes and inequities.

#### Dr Lisa Daniels
(Department of Medicine , University of Otago)

**Breast milk nutrient composition in healthy mother-infant pairs**

Despite breast milk being the main food for 69% of babies until about 8 months of age, we don't currently know how much breast milk they are consuming, or what the nutrient composition is, which makes it challenging to understand what intakes are required for health. In our First Foods New Zealand study, we are investigating how much breast milk New Zealand babies are consuming; this application is an extension of this work to determine the related nutrient composition of that breast milk from mother-infant pairs. Combining these novel data will yield new understanding about nutrient intakes at this very important time of life.

#### Dr Anita Dunbier
(Department of Biochemistry , University of Otago)

**Developing better therapies for metastatic oestrogen receptor positive breast cancer**

Over three quarters of breast cancer patients diagnosed in New Zealand present with hormone-sensitive disease and are treated with anti-oestrogen therapy. Unfortunately, many develop resistance to this therapy and cancer spreads to other parts of the body leading to significant loss of life. Better treatments for these patients are urgently needed. Our previous work suggests that anti-oestrogen therapy may make tumours more responsive to treatment that stimulates the immune system. We plan to test whether immune therapies in combination with anti-oestrogen therapy can be effective against cancers that have metastasised to other parts of the body.

## (B) LAURENSON AWARDS

Laurenson Awards are one-year grants for research concerned with the effects of diet and/or drugs on human health. Funds for a Laurenson Award round were not available in 2021.

## (C) JACK THOMSON ARTHRITIS FUND

This OMRF fund was established in 2011 and was made possible by a bequest from the late Jack Thomson. In December 2021 there were four applications (compared with four in the previous year) from the University of Otago totalling $98,173 and two of these were funded. All grants commenced on 1 February or 1 March 2022 and final reports are due at the end of April or May 2023. Abstracts from the final report will be available on the OMRF website **www.omrf.org.nz.** The funded projects are summarised below:

#### Dr Ross Wilson
(Centre for Musculoskeletal Outcomes Research, Department of Surgical Sciences, University of Otago)

**Excess health losses and costs in osteoarthritis with multimorbidity**

Osteoarthritis is a common, disabling condition, and people with osteoarthritis often have other long-term conditions. The occurrence of multiple co-existing conditions affects >42% of New Zealanders over age 45 years, with Māori and Pasifika disproportionately affected. Little is known about the extent to which having both osteoarthritis and one or more other long-term conditions, such as diabetes, cardiovascular disease, and depression, has an impact on health-related quality of life and the costs of healthcare consumption in the New Zealand healthcare system. This project will answer these questions using data from around 75,000 participants in the annual New Zealand Health Survey and linked administrative health data.

#### Dr Adele Woolley
(Department of Pathology , University of Otago)

**Identifying biomarkers in inflammatory osteoarthritis**

Pona Ngoikore - Osteoarthritis (OA), is a debilitating disease which is projected to affect increasing numbers of our aging population, posing an ongoing and significant health and economic burden to NZ. OA is the most common form of arthritis and is traditionally associated with mechanical 'wear and tear'. There are limited therapeutic options available, resulting in prolonged disability and decreased quality of life, until the advent of end-stage joint replacement. Recent research has found that patients may suffer from different types of OA which are due to a variety of factors including some which are driven by inflammation. This proposal aims to identifying inflammatory biomarkers in patients with this inflammatory subtype which will lead to both early intervention and to greatly improved health outcomes.

# 4. OTHER ACTIVITIES OF THE SCIENTIFIC COMMITTEE

## OMRF Student Speaker Awards at the Otago Medical School Research Society:

The Student Speaker awards are given to the student speakers who, in the opinion of a panel of three to four judges, gives the best and second best oral presentation – based on both the components of the presentation and its scientific merit. To be eligible the candidates must report work that has been performed under the auspices of the University of Otago.

(1) At the **August 2022** scientific meeting of the Otago Medical School Research Society (OMSRS) there were 10 **doctoral** candidates.

The second prize ($500), which was funded by the OMRF, was awarded to **Kushan Gandhi** (Department of Anatomy and Brain Health Research Centre) for their presentation on the topic of *"A focused ultrasound-mediated drug delivery system for Parkinson's disease"*.

(2) At the **May 2022** scientific meeting of the OMSRS there were 10 summer research scholars selected to give presentations of their projects. First prize ($500) was funded by the OMRF and was awarded to **Harriet Spoelstra** (Department of Anatomy) for their presentation titled *"The relationship between secreted amyloid precursor protein alpha (sAPPα) and the cell surface expression of NMDA glutamate receptors"*.

The OMRF summer research prizes since 2015 have been called "The Pat Cragg *Summer Scholar Speaker Prizes*" in recognition of the long-standing involvement by Professor Pat Cragg in the summer research scholarship assessing committee.

## OMRF-sponsored prizes at the Otago School's Science Fair:

The Foundation sponsors four prizes ($50 each) each year in the Special Prize category at the **Otago Aurora Science & Technology Fair** for secondary schools for projects involving medically orientated topics.

The 2022 recipients were:

*"Head gear or not?"* by **Mack Hay**, Mt Aspiring College, Wanaka (Year 7),

*"What in the wobble has got into you! A simple balance test can add years to your life"* by **Alexander Bork**, Dunedin North Intermediate (Year 8)

*"Can you catch it?"* by **Harriet Rowe**, Fairfield School (Year 8)

*"The line detector"* by **Beth Elder**, Columba College (Year 8)

The Foundation's judges were Drs Heather Cunliffe, Sarah Baird, Nick Heng and Rhodri Harfoot

# ACKNOWLEDGEMENTS

The Foundation continues to play an ever-increasing role in funding medical research in Otago. The last three years have especially highlighted the need for sustained and rapidly responsive medical research capacity. It has been a privilege to be part of the Foundation's contributions to the ongoing challenges posed by the global pandemic.

I wish to thank the members of the Scientific Committee for their dedicated efforts in carefully assessing the merits of the large number of summer research projects and grant applications that were received by the Foundation over the last year. We thank the Council of the Foundation for the support, advice and enthusiasm with which our funding recommendations are endorsed and the many Benefactors and Sponsors of the Foundation whose financial support has made all this possible.

*Professor Gregory T. Jones*

*Chair of the OMRF Scientific Committee*
*30 August 2022*

# EVENTS

## *GALA - cancelled for 2022*

It was with great disappointment this year that we had to cancel our Annual Gala in the midst of government Covid-19 safety regulations.

We are so grateful of our sponsors and supporters who, despite tough times for all, continued with their financial support of the Gala, and for this we would like to extend a huge thank you to Oceana Gold, Vero Liability, Aotearoa Gaming Trust, Select Recruitment, Anderson Lloyd, Stewart Construction, Otago Community Trust, Adam and Lynne Binns.

We took our Auction online for 2022 and using the Galabid platform we were able to open up the amazing Auction Prizes to even more supporters, including items generously donated by The Artists Room, The Framing Room, Armstrong's Volvo, Gibbston Valley Lodge and Spa, Jacks Point Golf Course and Allpress Coffee.

We were delighted to raise $51,000 and are looking forward to our 2023 Gala.

## *ANNUAL GOLF DAY May 2022*

Our Annual Golf Day was held on Friday 13 May at the St Clair Golf Club and the teams that supported our tournament for 2022 were treated to a gorgeous a utumn day.

Before the anticipated prizes were given, our Council Chair, Pat Cragg addressed the room to ensure all players and supporters were aware of the important research work their contributions go to.

### THE TOP TEN TEAMS ON THE DAY WERE:

- Forsyth Barr - 52.375
- Deloitte - 53.35
- Myers Marketing - 55.625
- Pro Shop Team - 55.625
- Craigs Investments - 55.75
- Will Hepburn Team - 55.875
- Team Burns - 56
- Fulton Hogan - 56.75
- Ever Hopeful - 57
- Estate of Grace - 57.125

Thank you to all the teams and sponsors that made the day a success - especially our Hole Sponsors: The Warehouse, Armstrong's Volvo, Calder Stewart, Myers Marketing, Craigs Investment Partners, Deloitte, McDonalds, Fulton Hogan and the St Clair Pro Shop.

*Sarah Rickerby - OMRF Events Manager*

*Photo Credit: Alex Lovell-Smith*

# OMRF CLUB OTAGO

We are so pleased to be able to continue with the OMRF Club Otago tradition again after a turbulent year for events, a tradition that has been in place with OMRF since 2012 and has raised over $700,000 through memberships, tickets and raffles.

Our first OMRF Club Otago for 2022, took place in July where we were delighted to be joined by former All Blacks Kees Meeuws, Ben Smith and NZ Rugby Director Rowena Davenport for a Panel discussion in the lead up to the All Blacks test in Dunedin. Facilitated by Melanie Kerr, the panel gave their insight and opinions on rugby's impact in the community and their careers to date.

## JOIN US

To join OMRF Club Otago, simply go to our website **omrf.org.nz/club-otago/** and fill out the form or contact Sarah Rickerby at **sarah.rickerby@omrf.org.nz**

Membership for the OMRF Club Otago is open to anyone, with memberships starting at $250 per year. All profits from the OMRF Club Otago lunches go towards funding life changing research.

Our face of research speaker for this event was Dr Roslyn Kemp, who shared her research on Immune interactions with bacteria in people with Crohn's disease. Roslyn was a wonderful speaker and gave an interesting and entertaining presentation.

On Friday 2 September we held our second OMRF Club Otago for 2022 with Soloist and Choreographer from the Royal New Zealand Ballet, Shaun James Kelly, as our Guest Speaker. We are lucky to have Shaun join us at the end of his busy schedule with the touring company of Cinderella.

Our face of research at our latest lunch was Professor John Reynolds who gave a wonderfully succinct presentation on his research into dopamine distribution into the brains for Parkinson's and brain cancer patients.

We are grateful to our current OMRF Club Otago membership who attend our events and welcome the opportunity to bring guests and extend our audience.

# *Our members in the 2022 year were:*

## PATRONS

## SENIOR FELLOW

Calder Stewart

## FELLOW

Ross & Bev Middlemass

Deloitte

McMahon Investments

RD Petroleum

## ASSOCIATE FELLOW

Forsyth Barr

Fulton Hogan

Brian Stevenson

Moore Markhams Otago

Harvie Green Wyatt

Mike Bird (AMBI Properties)

Grand Casino

## INDIVIDUAL

Trevor Millar
*(Cowell's Pavlovas)*

Mary Arnesen; Shirley Laney & Monica Urquhart

Janine Young

Jenny Soper
*(ANZ Private)*

Dorothy Chirnside
*(Werribee Trust)*

Michael Milne
*(Craigs Investment Partners)*

Barbara Bridger
*(Otago Community Trust)*

Octagon Dental Suite
*(Yash Khan)*

Otago Orthodontics
*(Emily Lam)*

Adam Binns
*(Quantify Consulting Limited)*

Malcom Farry
*(Farry Group)*

Tom West
*(Tom West Risk Advisers)*

Warren Taylor
*(Aotea Electric)*

Adam La Hood & Blair McGill
*(Cook Brothers Construction)*

Dave McPhedran
*(YBT: Accounting)*

Dave Callon
*(Share)*

Martyn Ballantyne & John Larsen
*(Suits on Wall Street)*

Carl Spruyt
*(Ikulutu Ltd)*

Simon Parker
*(Parker Warburton Team Architecture)*

John White
*(Telfer Electrical Otago)*

Noel Davie

Alison Glover
*(PKF Dunedin Ltd)*

Hamish Caithness
*(Oteha Valley Holdings)*

Sharyn Anderton
*(Webb Farry Lawyers)*

Dr Rod Keillor
*(Marinoto Clinic)*

Sharon Hyndman
*(BayleysMetro Realty)*

Justin & Eterei Stonelake
*(Stonelake Foundation)*

Mr Will McMillan
*(McMillan Medical Specialists)*

Prof Michael Schultz
*(Gastroenterology Otago)*

Peter & Paula Anstey

John Freeland
*(Aon New Zealand)*

Bill Haydon
*(Roman Catholic Diocese of Dunedin)*

Craig McGregor
*(39 Per Cent Ltd)*

Jenepher Glover
*(NZ RSA Trust)*

John & Jacqui Brenssell
*(PaperPlus Dunedin)*

Kristi Waldron
*(Polson Higgs)*

Dr Paul Templer
*(Sandman Anaesthesia Services)*

Sergio Salis
*(London Street Specialists)*

Graham Helm
*(Crombie Lockwood)*

Judy Bevin
*(J Bevin Ltd)*

Darryn Wilkie
*(Otago Properties 2018 Ltd)*

Steve Brocklebank
*(BB&S)*

Robert & Jill Reid

Ant & Chris Wither
*(Awhirk Farms)*

# FINANCIAL HIGHLIGHTS

## *Otago Medical Research Foundation Inc.*

This summary financial report has been authorised for issue by the Chairperson of the Council Prof Pat Cragg. The results presented in the summary financial report have been extracted from the full financial report for the year ended 31 March 2022. As such, this summary report cannot be expected to provide as complete an understanding as provided by the statements of financial performance, financial position and movements in equity of the Otago Medical Research Foundation Incorporated. A full copy of the audited financial report for the Otago Medical Research Foundation Incorporated for the year ended 31 March 2022 is available from the office of the Foundations administrators - Deloitte, Otago House, 481 Moray Place, Dunedin.

### Statement of Financial Performance

**For the Year ended 31 March 2022**

| | 2022 $ | 2021 $ |
|---|---|---|
| **Operating Income** | | |
| Donations, Bequests, Subscriptions | 430,131 | 437,210 |
| Investment Income | 129,025 | 165,320 |
| Gain on Disposal of Investments | 5,353 | 57,580 |
| | **564,509** | **660,110** |
| **Less Expenses** | | |
| Administration | 120,230 | 110,616 |
| Promotion Costs | 190,306 | 301,131 |
| **Total Expenses** | **310,536** | **411,747** |
| **Net Surplus before Research Grants** | **253,973** | **248,363** |
| Research Grants approved during the year | 434,414 | 617,494 |
| **Net Surplus for the year** | **(180,441)** | **(369,131)** |

### Statement of Financial Position

**As at 31 March 2022**

| | Market Value | 2022 $ | 2021 $ |
|---|---|---|---|
| **Current Assets** | | **152,084** | **213,948** |
| **Investments** | **5,965,288** | **4,582,344** | **4,897,181** |
| **Total Assets** | | **4,734,428** | **5,111,129** |
| **Current Liabilities** | | **69,154** | **265,415** |
| **Total Liabilities** | | **69,154** | **265,415** |
| **NET ASSETS (EQUITY)** | | **4,665,274** | **4,845,714** |

## Statement of Cash Flows

**For the Year ended 31 March 2022**

| | 2022 | 2021 |
|---|---|---|
| | $ | $ |
| Net Cash Flows from Operating Activities | (352,672) | (377,078) |
| Net Cash Flows from Investing Activities | 319,119 | 377,412 |
| **Net Increase / (Decrease) in Cash Held** | **(33,553)** | **334** |
| Cash at the Beginning of the Year | 160,906 | 160,573 |
| **Cash at the End of the Year** | **127,354** | **160,907** |

## Statement of Service Performance

**For the Year ended 31 March 2022**

The Foundation aims to establish world-class medical research for the benefit of local, national and international health.

The Foundation has provided a calendar of events in which members, supporters and the public were invited to participate - the Club lunches, annual dinner, annual golf day, and various other one-off events.

**Grants & Scholarships approved during the year:**

| | 2022 Number | 2022 Actual ($) | 2022 Budget ($) | 2021 Number | 2021 Actual ($) |
|---|---|---|---|---|---|
| Annual Grants | 4 | 142,100 | 51,000 | 6 | 169,632 |
| Annual Grants - Covid | - | - | - | 3 | 74,251 |
| Special Fund Grants | 3 | 50,937 | 40,000 | 7 | 176,164 |
| Summer Research Scholarships | 18 | 117,000 | 97,500 | 18 | 112,000 |
| Otago Medical Research Society Award Sponsorship | 4 | 4,450 | 7,450 | 4 | 7,450 |
| **Total** | **29** | **$ 314,487** | **$ 195,950** | **38** | **$ 539,497** |

The full financial report of the Otago Medical Research Foundation for the year to 31 March 2022 was authorised for issue by the Chairperson of the Council. The full financial statements applied Public Benefit Entity Simple Format Reporting - Accrual (Not-For-Profit). The auditor expressed an unqualified opinion. The summary financial report has been examined by the auditor for consistency with the full financial report. The auditor has expressed an unqualified opinion.

# AUDITOR'S REPORT

**Crowe New Zealand Audit Partnership**
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Dunedin 3016
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Dunedin 9054

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## REPORT OF THE INDEPENDENT AUDITOR ON THE SUMMARY FINANCIAL STATEMENTS

**To the Council of Otago Medical Research Foundation Incorporated**

*Opinion*

The summary financial statements, which comprise the summary statement of financial position as at 31 March 2022, the summary statement of financial performance and the summary statement of cash flows for the year then ended, and related notes, are derived from the audited financial statements of Otago Medical Research Foundation Inc. (the "Foundation") for the year ended 31 March 2022.

In our opinion, the accompanying summary financial statements are consistent, in all material respects, with the audited financial statements, in accordance with FRS-43: *Summary Financial Statements* issued by the New Zealand Accounting Standards Board.

*Summary Financial Statements*

The summary financial statements do not contain all the disclosures required by Public Benefit Entity Simple Format Reporting – Accrual (Not-For-Profit). Reading the summary financial statements and the auditor's report thereon, therefore, is not a substitute for reading the audited financial statements and the auditor's report thereon. The summary financial statements and the audited financial statements do not reflect the effects of events that occurred subsequent to the date of our report on the audited financial statements.

*The Audited Financial Statements and Our Report Thereon*

We expressed an unmodified audit opinion on the audited financial statements in our report dated 9 August 2022.

*Council's Responsibility for the Summary Financial Statements*

The Council are responsible on behalf of the entity for the preparation of the summary financial statements in accordance with FRS-43: *Summary Financial Statements*.

*Auditor's Responsibility*

Our responsibility is to express an opinion on whether the summary financial statements are consistent, in all material respects, with the audited financial statements based on our procedures, which were conducted in accordance with International Standard on Auditing (New Zealand) (ISA (NZ)) 810 (Revised), *Engagements to Report on Summary Financial Statements*.

Other than in our capacity as auditor we have no relationship with, or interests in, the Foundation.

**Crowe New Zealand Audit Partnership**

CHARTERED ACCOUNTANTS

Dated at Dunedin this 9th day of August 2022

The title 'Partner' conveys that the person is a senior member within their respective division and is among the group of persons who hold an equity interest (shareholder) in its parent entity, Findex Group Limited. The only professional service offering which is conducted by a partnership is the Crowe Australasia external audit division. All other professional services offered by Findex Group Limited are conducted by a privately-owned organisation and/or its subsidiaries.

Otago Medical Research FOUNDATION

Annual Report to 31st March 2022

Charities Number: CC33444

OMRF.ORG.NZ