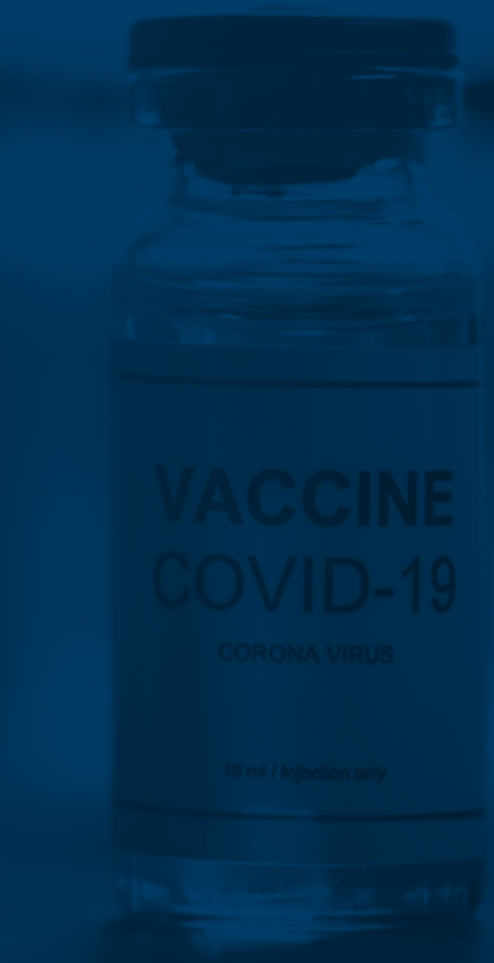
Otago Medical Research FOUNDATION

2021 Annual Report



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Charities Number: CC33444

OMRF.ORG.NZ

ABOUT THE FOUNDATION

The Otago Medical Research Foundation 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 scholarships in Otago.

Founded in 1967 to further medical research in Otago, we have committed almost $10.5 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.

Student Summer 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.

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 14.

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 eligible projects and scholarship students 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, or donate directly through 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

2021 GRANTS TOTALLED
$617,494

TOTAL AMOUNT FUNDED*
$10,453,200
*Since the Foundation's inception

It is with pleasure that I present the 53rd Annual Report on the Otago Medical Research Foundation's activities for the 2021 financial year.

During the year under review, the Foundation approved Grants totalling $617,494 an increase of $87,538 on last year's total of $529,956. Since the Foundation's inception, a total of $10,453,200 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 $369,131 compared with a deficit for the previous year of $80,563 which is $288,568 worse than last year but not surprising given the impact COVID-19 has had since March 2020 on the economy and the ability for people to donate to charitable trusts. Total Operating Income (Donations, Bequests, Subscriptions and Investment Income) decreased by $274,744 while Expenses decreased by $73,714 and Grant expenditure increased by $87,538. Last year's income included a realised loss of $41,530 on sale of Investments while in the current year there was a Gain of $57,580 on disposal of Investments. It would be good to see an increase in the receipt of further injections of capital for investment, which would help to counter the reduced investment rates that we earn on our conservatively invested funds.

"This year marked the 24th year in which the Otago Community Trust has awarded an Annual Grant to the Foundation"

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. 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 $1,516,459, which is 59% of cost. At 31 March, 2021, Accumulated General Funds total $24,169 and Accumulated Special Funds $4,821,545 a total of $4,845,714, both these figures comprising Capital and Income.

This year marked the 24th 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 $1,711,000 – 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 24 years.

"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 24 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.

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 our new Events Manager, Sarah Rickerby, who started working for the Foundation in late October 2020, my sincere thanks. In particular, I would like to thank Susan for covering the Events Manager role in the period July 2020 until late October and guiding Sarah into her new role. Susan and Sarah are the faces and voices of the Foundation! Your efforts in raising the profile of the Foundation and funds for research during the year are really appreciated. Susan's report can be found on page 7 and Sarah's event reports commence on page 24.

"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."

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 and advice on grant applications to ensure a transparent and robust process which ensures the Foundation's fund 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.

To the Investment Sub-Committee members, Judy Bevin, Michael Milne, Rathan Subramaniam, 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 Adamson, Josh Cuming, Nathan Lee and Trudy Corbett for continuing to provide very professional, friendly and efficient administration services for the Foundation. Jamie and Josh are the face of Deloitte for the Council while Trudy and Nathan work 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 the previous chair of Council, Ken Dempster, for continuing unofficially in the role of co-chair from mid-October 2020 to the end of the year due to my other commitments during that period, my grateful thanks.

On behalf of the Council,

Professor Pat Cragg
Chairperson

BEHIND THE FOUNDATION

JAMIE ADAMSON

Deloitte has long had a close relationship with the Otago Medical Research Foundation, but its staff over the years never stop being blown away by the talent and passion of those involved in the Foundation's work.

Deloitte provides financial administration services to the Foundation, but the connections are much wider than that; it is proud to sponsor the summer research programme, which keeps talent local and supports research activity. It supports Club Otago and are strong supporters of the golf day, the gala, and other events. Deloitte people have also served on the Foundation's council over the years – Ken Dempster was Chair for 10 years.

Deloitte Partner Jamie Adamson says that close involvement is acknowledgement of a worthy cause.

"The fact that the Foundation does this incredible grassroots research in Otago means we are supporting both the researchers and the region. It is rewarding to kick-start experimental projects at that grassroots level, where there is a void of investment, knowing it could make a real difference over time. It's leading edge, sometimes exploratory, but can move into great things – every project is worthy. World class research carried out in world class facilities – all right here."

"It's also amazing to be surrounded by such passionate people who are willing to dedicate their time to the cause."

"Our staff love being involved and give their time willingly, knowing they are supporting an organisation that gives so much."

COVID-19 had an impact on the Foundation's events calendar, but its large and loyal supporter base has been hugely helpful, from attending the functions that have been able to run over the last year, through to donating and granting money.

"That goes to the quality of the organisation and what they do to fund quality research here in Otago, especially the work by the Foundation's Scientific Committee led by Professor Greg Jones," Mr Adamson said.

> "The fact that the Foundation does this incredible grassroots research in Otago means we are supporting both the researchers and the region."
>
> **JAMIE ADAMSON**

"The Foundation is well placed to continue to support local research – in particular we were proud to see it provide special funding for COVID-19 projects."

Jamie has been a member of the Foundation since 2018. "For me personally, it's great to be working with such a dedicated small team, it's interesting to be involved at that grass roots level of research, and I love that this helps to keep people in Dunedin."

OTAGO MEDICAL RESEARCH FOUNDATION MEMBERSHIP

ORDINARY MEMBERS

Prof W C Abraham
Ashburn Hall Charitable Trust*
Dr F J Austin*
Emeritus Prof. Gil Barbezat
Mr J Burton
Caversham Pharmacy (2005) Ltd
Dr S O Chin*
Mr E J Chronican*
Dr J I Clayton
Dr Alison Cook
Mr K G Dempster
Mr Malcolm Farry
Assoc Prof Merilyn Hibma
Mrs L Homersham
Mr M Horne
Mrs E Howie
Prof I L Lamont
Emeritus Prof A C B Molteno
Emeritus Prof J G Mortimer
Assoc Prof D Oorschot
Emeritus Prof D.C.G. Skegg
Dr Wayne Sutherland
Dr M Turner
Dr & Mrs G P White
Assoc Prof Sigurd Wilbanks
Mrs S M Wilkinson*
J O'Rourke

** Indicates Founder Member*

RESEARCH PATRONS

Hope & Sons Limited
Otago Asthma Society Inc.

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
Prof P A Cragg
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

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 summer student research scholarships. Last summer we received 179 summer scholarship applications and funded 21. These scholarships allow the students to work in a lab on a research project through the summer and are highly sought after with 143 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 continues its impact on all of us. For the Foundation it has reduced our 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 now chaired by Professor Pat Cragg, who bring a variety of business and academic skills to the OMRF table, and to Sarah Rickerby, our Event Manager who has joined the Foundation as our Events Manager. I would like to also thank Mr Ken Dempster, our former Chair, who oversaw all the work of the Foundation for 10 years.

I also want to acknowledge the excellent behind-the-scenes support provided by Deloitte; considered portfolio management by Craigs Investment Partners, who ensure our financial position is healthy; and Crowe Horwath, our auditors. Thanks also to Walsh & Beck who do great work behind the scenes for us on our website 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 $5000 and annual grants of $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

FUNDS RECEIVED

Community Grants and Donations

$246,717

Events

$65,298

Bequests

$15,514

$327,529

DONATIONS:

ACE Shacklock CT

C & J Trotman

Caversham Pharmacy

ER Howie

F McDonald

H Caithness

J O'Rourke

K Dempster

M Read

R & B Middlemass

RD Petroleum

S Lister

S Sims

SpecSavers Dunedin

BEQUESTS:

AR Bascand

Ethel Johnston Charitable Trust

GRANTS:

A Goulding

ADEPT-MACTODD Charitable Trust

Aotea Group Holdings Limited

C & E Matheson

Deloitte

EMM Haynes Charitable Trust

Grand Casino (formerly Dunedin Casino)

Healthcare Otago Charitable Trust

JAD Iverach Memorial Fund

Lion Foundation

Paper Plus Dunedin

The Perpetual Guardian Foundation's McGillvray Brothers Scholarships

Rosey McConnon

The Healthcare Otago Charitable Trust

The Otago Community Trust

Aotearoa Gaming Trust (formerly The Southern Trust)

The Stonelake Foundation

William Downie Stewart Charitable Trust

OMRF RESEARCHER AND SUPPORTER PROFILES

RESEARCHER SPOTLIGHT

PROFESSOR ROSLYN KEMP

Just how important is "Treg", and what does that have to do with the Otago Medical Research Foundation?

Tregs are regulatory cells known to have a role in human immunity. Immune responses, along with genes, environment and malfunctioning intestinal lining, are the factors causing Inflammatory Bowel Diseases (IBD).

So, understanding how Treg cells control immunity and what effect they have on people with chronic intestinal inflammation such as Crohn's Disease will contribute to treatment.

The reality is that disease is very different in humans, and therefore so is their response to immune cells. A major health challenge then is predicting an individual's response, given that not all treatments work for all patients.

A study by Professor Roslyn Kemp and her team at the University of Otago has been bringing together gut, immune cells from patients at Dunedin Hospital, and bacteria into a study aimed at pinpointing the underlying mechanisms at play.

They studied the differences in T cell populations between healthy people and those with Crohn's Disease, and what effect the T cells had on the lining of the intestine.

The team are doing something novel by using an organoid – that is gut cells taken from a patient and developed into a monolayer model in the lab – basically a fake gut. They then layer on immune cells and bacteria to replicate the gut lining barrier, immune response and gut microbes from individual patients.

"I'm inspired by the researchers whose attitudes are to do it differently, finding ways to overcome the barrier that has taken a line of research as far as it can go."

The ultimate aim is to understand all of the interactions going on, rather than a select few. Then, by seeing the reaction of one patient's immune cells in this model, they should be able test its reaction to treatment. And based on that reaction, they hope eventually an "immune signature" can predict the best course of treatment – in gut issues and even in immune responses in tumours.

There is a long way to go - IBD is massively complex and developing targeted individual treatments is enormously challenging. This is precision medicine in its infancy and it's an exciting place to be.

The Otago Medical Research Foundation study is a fundamental building block. "It's taking a hard fundamental experiment with a small question and expanding it into answers and bigger questions."

"The team are doing something novel by using an organoid – that is gut cells taken from a patient and developed into a monolayer model in the lab – basically a fake gut."

Roslyn finds it's fun to do the hard experiments. "To make the really big advances, we have to look at the bigger picture, at all of the interactions, and we need collaboration across different fields of research.

"I'm inspired by the researchers whose attitudes are to do it differently, finding ways to overcome the barrier that has taken a line of research as far as it can go."

"Also, it's great that we can make this Otago medicine – involving Dunedin Hospital patients and University of Otago researchers and students."

SUPPORTER SPOTLIGHT

GEOFF CHUNG

What does a global car producer and local medical research have in common?

Quite a lot says Geoff Chung, General Sales Manager Armstrong's Volvo, Dunedin.

Armstrong's Volvo are a Patron Member of the Otago Medical Research Foundation's Club Otago lunch series.

Both Volvo and the Foundation rely on research and human innovation, and both have people at the core.

"The driving force behind our business isn't cars, it's people", explains Geoff. "Globally Volvo spend a lot of money on research that focus on people first – we design around the needs of the people using our cars, not how fast we can make the car go."

Volvo Cars has been a leader in car safety for decades — they have invented some of the most important features in the history of vehicle safety – including the three-point safety seatbelt. In fact, their vision is that no one should be seriously injured or killed in a new Volvo car.

"We see similar values in the Research Foundation – they have a clear vision to make people's lives better, and they have some very smart people working on research to make that happen."

But Geoff pointed out they don't patent new safety features; they share so that everyone can benefit. And in the process, millions of lives have been saved.

"Volvo see the future of safety as not just safety for the individual, but safety for all humans – hence the drive for 2025 towards sustainability, and for 50 percent of global sales to be electric. For New Zealand, that means Volvo will only be selling Mild Hybrids in XC60 and XC90 by August 2021, and it is offering a plug-in hybrid option in all models (including the highly popular XC40)."

"We see similar values in the Otago Medical Research Foundation – they have a clear vision to make people's lives better, and they have some very smart people working on research to make that happen." That's why we see this as a good fit – we both are looking for ways to build the communities who support us."

"And for me, I love listening to a new guest research speaker at every lunch, knowing we have had a part to play in their research – it's interesting and very satisfying."

"Our sponsorship relationship benefits both organisations – we get to talk cars to people at the events, and we support projects we know are making a difference. It's about people's lives."

RESEARCHER SPOTLIGHT

PROFESSOR JOHN REYNOLDS

The contribution that the Otago Medical Research Foundation makes to progressing novel research ideas cannot be underestimated.

The Foundation funded one of Professor John Reynolds' projects into Parkinson's disease recently and he is now working on a new and potentially game-changing trial into the disease.

His non-traditional approach to identifying people who have early signs associated with Parkinson's is one that involves dreams.

It is already known that there is a link between those who develop Parkinson's disease, and people who act out dreams in the Rapid Eye Movement (REM) cycle of their sleep. That doesn't mean that all people experiencing physically acting dreams with movements and vocal sounds will develop Parkinson's, but it is possible that it may be a pre-cursor for some people.

Just how that works, and how it can be then turned into a predictor is key.

John's team at the University of Otago's Anatomy Department is developing a simple computer-based behavioural test to determine if people who have this REM sleep behaviour disorder share similar signs to those associated with the development of Parkinson's disease. This tool could be used as early diagnosis, but may also potentially provide research pathways for treatment and even prevention of Parkinson's in the longer term.

"The earlier we can diagnose a disease, the better we can treat and manage it, so it's something the world will look to with interest."

The test he and Dr Mariana Leriche have developed is already showing promise from studying small numbers of

volunteers they have been able to find through the sleep clinics in Dunedin. They are now developing the algorithms and aim to put a test online to assess far greater numbers of people experiencing this dream-enacting behaviour. "This deep learning from more study participants will help us to form a better picture of what is going on, and for us to finetune the testing process."

"This research simply wouldn't have happened without the willingness of the Foundation to take a risk on a hunch. With the subsequent data, the small study then attracts large-scale funding and becomes significant."

John is passionate about translational research, having taken the path to a PhD in medical research via medical electronics, developing an interest in rehabilitation, particularly in strokes and Parkinson's disease in the elderly on the way.

"Developing tools that can potentially diagnose Parkinson's is a long journey we are only just beginning on, but it could potentially be a significant global development. I would be very satisfied to get to the end of my career knowing that I have contributed to this."

"This research simply wouldn't have happened without the willingness of the Foundation to take a risk on a hunch. With the subsequent data, the small study then attracts large-scale funding and becomes significant."

"It's a great testing ground for initial research and I'm grateful the Foundation gave us a go on this study."

SUPPORTER SPOTLIGHT

JANINE YOUNG

Choosing a charity to support in your bequest is often tricky when there are so many worthy causes around.

But when retired Dunedin woman Janine Young went along to her first Otago Medical Research Foundation luncheon with a friend, her own bequest decision-making suddenly became a whole lot clearer.

"We are supporting researchers who had a passion for what they do, and that they do it because they care. And who wouldn't want to help people who feel like that?"

"I listened to a talk from a researcher about breast cancer, and how some really remarkable discoveries stemmed from a small study funded by the Foundation as a starting point. One project triggered other people to go full steam ahead with their own ideas based on those findings – standing on the shoulders of those before."

She found it fascinating to see how research discoveries were shaped, and had no idea such work was going on right here in Dunedin. "It was an eye opener."

Janine joined the Foundation then and has been to every luncheon since. "It's always interesting to listen to the wide range of researchers– all different but all well explained. And I really enjoy hearing about the young students supported by the Foundation - they are inspiring."

She has a very personal interest in medical science – her brother was a quadriplegic after a rugby accident. "He was supported into a full life, but when he passed on he wanted to make sure his assets were used to help, so we donated funds towards spinal research," Janine said.

"It's always interesting to listen to the wide range of researchers– all different but all well explained, and I really enjoy hearing about the young students supported by the Foundation - they are inspiring."

"Now we have got to the stage of thinking about what to do with our own assets. Ron and I are just regular people - we're not philanthropists or billionaires, we're just busy active retired graphics designers who enjoy travelling, friends and staying fit. But we do want to make sure we do something worthwhile with the proceeds of our house, when the time comes."

They both saw the value in supporting local research, hence the decision to make a bequest to the Foundation.

"It was a brilliant idea. We know it will make a little bit of a difference, to medical science and to the researchers themselves but it's more than that – it is a beautiful feeling to think we are doing something really meaningful to us. We are supporting researchers who had a passion for what they do, and that they do it because they care. And who wouldn't want to help people who feel like that?"

FUNDING DISTRIBUTION

Scholarships, grants, trust grants, Laurenson grants and Jack Thomson grants

SUMMER RESEARCH SCHOLARSHIPS

Mental Health
$5,000

Antibiotic Resistance
$5,000

Breast Cancer
$6,000

Ophthalmology
$5,000

Vaping
$5,000

COVID-19
$5,000

Antibiotics
$6,000

Alzheimer's
$5,000

Kidney
$5,000

Gout
$5,000

Brain
$5,000

Cancer
$20,000

Heart
$15,000

Diabetes
$10,000

Influenza
$5,000

ANNUAL GRANTS

Measles
$34,065

Infant Health
$16,666

Elderly Health
$33,890

Lung Cancer
$38,939

Infection
$26,000

Child Sleep
$31,146

OTAGO COMMUNITY TRUST

Breast Cancer
$39,654

Diabetes
$38,345

LAURENSON BEQUEST

Stroke
$34,407

Antibiotic Resistance
$13,086

Infant Health
$32,233

JACK THOMSON BEQUEST

Joint Pain
$26,447

Arthritis
$52,950

Funding distributed financial year ending March 2021

THE OTAGO MEDICAL RESEARCH FOUNDATION COUNCIL

EX OFFICIO MEMBERS

Prof G Jones
Chairperson of Scientific Committee

Mr J Adamson
Deloitte (Secretaries)

Prof R Subramaniam
Dean Dunedin School of Medicine

Prof B Hyland
Dean Otago School of Biomedical Sciences

Dr H Cunliffe
Deputy Chairperson of Scientific Committee

APPOINTED MEMBERS

Dr N Millar
Otago District Health Board

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

ELECTED MEMBERS

Mrs J Bevin

Dr M Coleman

Prof P Cragg

Mrs S Knowles

Mr M Milne

EXECUTIVE

Prof P Cragg
Chairperson

Prof G Jones
Deputy Chairperson

Deloitte representative
Secretary/Treasurer

SCIENTIFIC COMMITTEE

Prof G Jones
Chairperson

Department of Surgical Sciences, Dunedin School of Medicine

Dr H Cunliffe
Deputy Chairperson

Department of Pathology, Dunedin School of Medicine

DIRECTOR OF DEVELOPMENT

Ms S Sims

EVENT MANAGER

Ms S Rickerby

SECRETARIES

Deloitte

HONORARY SOLICITOR

Mr J Anderson (Gallaway Cook Allan)

AUDITORS

Crowe

PATRON

Emeritus Professor Gil Barbezat

SCIENTIFIC COMMITTEE REPORT

1 July 2020 to 30 June 2021

1. MEMBERSHIP

Chair: Professor Greg Jones

Deputy Chair: Dr Heather Cunliffe (Co-opted)

Associate Professor Hesham Al-Sallami (Co-opted)

Dr Andrew Bahn
(Nominee Otago Medical School Research Society)

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 Keith Ireton (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 Andrew Bahn and Associate Professor Keith Ireton at the end of 2020. The Foundation thanks both Andrew and Keith for their sustained and dedicated contributions.

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

2. SUMMER RESEARCH SCHOLARSHIPS 2020/2021

One hundred and seventy-nine applications (compared with 138 the previous year) for an OMRF summer research scholarship were received from the University of Otago in late August 2020, of which 21 (compared to 28 in the preceding year) were recommended for funding by the OMRF. Of the 21 students funded by the OMRF, 10 were studying in the biomedical sciences, 10 medicine and 1 dentistry. 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 (formerly Dunedin Casino); EMM Haynes Charitable Trust; Fiordland Discovery; Stonelake Foundation; Dr Ailsa Goulding; Kingston Sedgfield Trust; Marion Rhodes Memorial; Walsh & Beck; Flavell Memorial Summer Research Scholarship; Manning Memorial Summer Research Scholarship; Esperanz Summer Research Scholarship; Healthcare Otago Charitable Trust; Deloitte; OMRF

Wilkinson; OMRF McQueen; OMRF Iverach; Rosey McConnon; and The Perpetual Guardian Foundation's McGillvray Brothers Scholarships. The involvement of Otago commercial companies and the Otago community for a ninth 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 2021. The Renshaw Prize ($250) for the best report was awarded this year to Ella Macbeth who worked under the guidance of Dr Scott Ferguson in the Department of Microbiology and Immunology, 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.

ELLA MACBETH

Supervisor: Dr Scott Ferguson, Microbiology and Immunology

Renshaw Prize Winner for the best OMRF summer research scholar report

PROJECT: Reversing antibiotic resistance in an important human pathogen

Funder: EMM Haynes Charitable Trust

ABSTRACT: If antimicrobial resistance (AMR) could be chemically reversed, and this mechanism understood, then antibiotics that have been rendered ineffective could be 'brought back to life' and used again as therapeutics. Zinc ionophores such as PBT2 translocate zinc across bacterial membranes and resensitize methicillin-resistant Staphylococcus aureus (MRSA) to β-lactam antibiotics of the penicillin subclass (e.g. oxacillin) through an undefined mechanism. Previous research in this laboratory indicates PBT2 causes the intracellular build-up of zinc ions, which dysregulates the balance of manganese ions. This project aimed to examine the relationship between PBT2-mediated manganese starvation and β-lactam resensitization in MRSA. Manganese supplementation rescued MRSA from an otherwise inhibitory combination of PBT2, zinc and oxacillin, highlighting the importance of this metal in β-lactam resistance. Additionally, PBT2 was unable to resensitize MRSA to killing by other β-lactam subclasses beyond Penicillins (e.g. carbapenems). Future experiments will be aimed at developing PBT2 for use as a combination therapy to treat severe MRSA infections.

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

AILEEN HARWOOD

Supervisor: Dr Simon Jackson, Microbiology and Immunology

PROJECT: Validating Novel Toxin/Antitoxin Systems in Bacteria

Funder: OMRF Wilkinson

ABSTRACT: Toxin/antitoxin (TA) systems are widely distributed in bacteria and are important in protecting bacteria against bacteriophage attack, starvation and antibiotic stress. This project aimed to determine whether fourteen computationally predicted TA systems are genuine. First, to determine whether the putative toxin gene was toxic, toxicity assays were completed. Following this, antitoxins were cloned. Finally, toxin and antitoxin genes were expressed alone and together in toxicity neutralisation assays to determine whether the toxin induced a growth defect and whether the antitoxin could neutralise this. Here, we present the results of the functional validation of four predicted TA systems. Overall, we confirm that three putative systems – TA3, TA18 and TA19 – are genuine TA system. However, without further experiments, we cannot make conclusions about the other predicted TA systems.

ALIESHA KEMP

Supervisor: Dr Louise Bicknell, Pathology

PROJECT: Investigating new cellular roles for DONSON in brain disorders

Funder: Grand Casino (formerly Dunedin Casino)

ABSTRACT: Mutations in DONSON have been identified in two different genetic disorders; Meier-Gorlin syndrome, and Microcephaly, Short Stature and Limb Abnormalities syndrome. These two groups of patients have a wide range of brain growth profiles and the underlying reason is currently unclear. However, a new role for DONSON at the centrosome, an important structure in the cell involved in cell division, was recently proposed which might link to the variable reduction in brain size. DNA containing the patient mutations were introduced into cells to investigate their effect. Overall, it was observed that some mutations were able to produce normal appearing cells, while others lead to some abnormal number of centrosomes within some cells. Based on these preliminary findings, future investigations can be directed towards investigating this new role of DONSON and the possible explanation for the differences in brain growth.

AMMAR MANAWASALA

Supervisor: Associate Professor Rajesh Katare, Physiology

PROJECT: Use of Interleukin-10 to Prevent Gentamicin Induced Cochlear Ototoxicity

Funder: Deloitte

ABSTRACT: Exosomes: Potential nano molecules for treating ischaemic heart disease in diabetic patients?

In diabetic patients, the risk of developing heart diseases is much greater. Additionally, patients with diabetes have a lower chance of recovering from these diseases. One potential promising therapy is stem cell therapy. However, recent studies identified that stem cell therapy mainly acts through the communication between cells to promote regeneration of lost cells. The reason for this loss of communication is not known. In a healthy environment, cell-to-cell communication occurs through biological molecules transferred in small nanovesicles called exosomes. In this study, we tested whether, diabetes affects exosomes by measuring their size and preliminary results showed that diabetic exosomes were larger than their non-diabetic component, signalling a potential explanation for poorer prognosis in diabetic patients.

AMY BENNIE

Supervisor: Prof Rhonda Rosengren, Pharmacology and Toxicology

PROJECT: How Does Dioxin Reduce Breast Cancer Risk at Low Doses, but Increase Risk at High Doses?

Funder: OMRF McQueen

ABSTRACT: Dioxin, a common environmental pollutant, has been associated with a decreased risk of developing breast cancer at low doses, but an increased risk at high doses. The mechanism underlying this unusual trend is not yet understood. Dioxin blocks one growth pathway used by breast cancer cells, thus one way this trend may occur could be through increased activity of other pathways within cells causing them to grow. Therefore, this research aimed to investigate whether this was observed in breast cancer cells. The preliminary findings of this study suggest that dioxin does indeed increase the growth of certain breast cancer cells at moderate and high concentrations, providing support for the validity of the trend observed in previously published studies.

ANDREA VAN TURNHOUT

Supervisor: Associate Professor Ivan Sammut, Pharmacology and Toxicology

PROJECT: How does low dose Carbon Monoxide protect the heart prior to surgery?

Funder: Kingston Sedgfield Charitable Trust

ABSTRACT: Cardiovascular disease remains the leading cause of death globally and in New Zealand and with the continual increase in the numbers of patients experiencing heart failure comes a heightened demand for effective interventional surgery. 'Open heart' surgery is a substantial clinical undertaking wherein the blood supply to the heart is momentarily stopped and can potentiate cardiac injury. Interestingly, low protective doses of carbon monoxide (CO) may be the key to improving patient outcomes by decreasing the impact of a lack of oxygen to the heart during surgery. Thus, CO has the potential to improve patient outcomes and quality of life. Our collaborative team has developed compounds to safely deliver CO to tissue, using fast-release precursors such as oCOm-21. My research conducted using mitochondrial specific fluorescent dyes and real-time cell fluorescence studies showed that low dose oCOm-21 can activate mitochondrial signalling pathways in human heart cells.

ANDREW XIAO

Supervisor: Dr Sean Coffey, Medicine

PROJECT: Can MRI be used to detect aortic valve stiffening?

Funder: Walsh & Beck

ABSTRACT: Heart valve disease places a significant burden on the healthcare system in New Zealand, and aortic stenosis is one of the most common forms of heart valve disease. Aortic stenosis is currently diagnosed using heart ultrasound (echocardiography). Cardiac MRI is only rarely used to examine heart valve disease. Our project examines whether cardiac MRI can also be used for aortic stenosis detection. By examining 188 consecutive cardiac MRI and their corresponding echocardiograms, we found that cardiac MRI shows promise in ruling out aortic stenosis in negative tests, but due to small numbers of patients with aortic stenosis having cardiac MRI, there is uncertainty about the accuracy of the test. Future research will require larger numbers of patients to reduce the degree of uncertainty about the accuracy of cardiac MRI in diagnosing aortic stenosis.

EMMA HORN

Supervisor: Dr Blair Lawley, Microbiology and Immunology

PROJECT: Creating a model system to test SARS-CoV-2 vaccines and drugs.

Funder: The Perpetual Guardian Foundation's McGillvray Brothers

ABSTRACT: Two years ago in China, a whisper of disturbance crept across the streets of Wuhan City, a novel coronavirus which has since spread internationally to cause the largest pandemic in over a century. With scientists striving to create effective treatments and vaccines, much attention is focussed on developing optimised methods to test their efficacy. We aimed to develop a protocol that could be used by the Quiñones-Mateu laboratory to test vaccines and novel drugs in a faster, cheaper and safer way compared to the previous system. This involved testing multiple viral constructs known as 'pseudotypes' which infect cell cultures in the same way as SARS-CoV-2, without replicating or causing disease. Five different pseudotypes were analysed using fluorescent microscopy and luciferase assays to find the one most compatible with our requirements. This pseudotype, containing a Luc/ZsGreen identifiable viral core, will be used to analyse COVID-19 treatments and vaccine induced antibodies.

GRAYSON WASS

Supervisors: Prof Julia Horsfield, Pathology

PROJECT: Investigating genetic variants in Māori/Pacific populations that associate with gout.

Funder: Healthcare Otago Charitable Trust

ABSTRACT: This project used zebrafish and their embryos as a model to study Māori and Pacific genetic variants that associate with gout. Gout is a chronic disease which, in Aotearoa, has been shown to disproportionately affect Māori and Pacific populations. The Māori /Pacific genetic variants were cloned into various constructs that can later be microinjected into developing zebrafish embryos. Embryos that had previously been injected were analysed for expression with the results showing putative expression around the zebrafish brain and eye. Furthermore, the expression of seven genes that were shown to be linked with the genetic variants were analysed using a technique called whole- mount in situ hybridisation. Two of these genes had expression around the developing zebrafish brain. By linking genes to the Māori and Pacific variants the mechanisms of how they are associated with gout can begin to be uncovered and research can begin to be translated into clinical benefit.

HANNAH DAWES

Supervisor: Dr Sarah Diermeier, Biochemistry

PROJECT: Assessing a New Therapeutic Target for Colorectal Cancer

Funder: Fiordland Discovery

ABSTRACT: Assessing a New Therapeutic Target for Colorectal Cancer

Colorectal cancer (CRC) is the second biggest killer in terms of cancer in New Zealand. In this project, a molecule previously shown to contribute to breast cancer development was studied as a possible new therapeutic target for CRC. To test whether this molecule, hMaTAR17, contributes to CRC, CRC cells with and without hMaTAR17 were compared. From these tests it was identified that hMaTAR17 may regulate the Vimentin gene, known to increase the spread of cancer. CRC cells containing hMaTAR17 were found to grow 26% faster than cells without, suggesting the molecule increases the rate of cancer growth. Overall, this project showed that hMaTAR17 increases CRC development and growth, indicating a potential new CRC therapeutic target.

JACOB (JAKE) WARD

Supervisors: Prof Robert Walker, Medicine

PROJECT: Are we managing gout properly in renal patients? A pilot study on the efficacy of allopurinol in dialysis patients

Manning Memorial Summer Research Scholar

ABSTRACT: Gout is very prevalent in New Zealand, posing a significant burden on those who suffer from it. Patients with impaired kidney function have an increased risk of developing this debilitating disease. Allopurinol is a medication used to prevent gout, but how it is removed from the body of patients undergoing peritoneal dialysis (PD) is poorly understood. This study aimed to investigate the clearance of allopurinol in peritoneal dialysis patients being treated with allopurinol for gout by measuring the concentrations of allopurinol in the plasma, dialysate and urine over a 24 hour period in these participants. The hope is to have a better understanding of the effectiveness of the current recommended doses. Unfortunately, we were unable to recruit enough participants over the summer period to perform any analysis, and this project will extend over the coming year.

JENNA (YUYI) FENG

Supervisor: Dr Marina Kazantseva, Pathology

PROJECT: Analysis of mechanisms by which p53 isoforms contribute to oncogenic pathway activation in cancer cells

Marion Rhodes Memorial Scholar

ABSTRACT: Cancer promoting shortened variants of the TP53 gene, called Δ133p53 isoforms have been shown to be increased in many aggressive cancers that are more likely to resist treatment, invade and recur. In this project, we investigated whether Δ133p53 isoforms contribute to cancer pathway activation via activation of a tyrosine kinase receptor, AXL. Using western blot analysis to detect specific protein expression we found an increased level of activated/phosphorylated AXL and its ligand Gas6 in Δ133p53-expressing lung cancer cells compared to control cells. Signalling pathway for cell migration, p38 MAPK controlled by AXL was also activated in Δ133p53 cells. These results point the role for Δ133p53 in promoting cancer progression via regulation of Gas6/AXL pathway activation. This can provide better understanding of cancer pathways to improve treatment.

KATE MCELROY

Supervisor: Prof Alison Rich, Pathology

PROJECT: Genes implicated in mucoepidermoid cancer

Funder: Dr Ailsa Goulding

ABSTRACT: Mucoepidermoid carcinoma (MEC) is the most common malignant tumour that occurs in salivary glands. Recently, advances have been made in understanding the genetic basis of this tumour, identifying specific mutations in more than half of cases. Identification of these mutations is useful in distinguishing MEC from other tumours that may mimic its appearance under the microscope. Fluorescent in-situ hybridisation (FISH), is a relatively new technique used to identify these mutations, and is in increasingly common use internationally. Our research utilised FISH to investigate the presence of these mutations in cases of MEC diagnosed at the University of Otago's Oral Pathology Centre, over a 20 year period (2000-2020). We found that half of our cases of MEC were positive for this mutation, and confirmed that the mutation was absent in the comparison tumours investigated. These findings are consistent with existing international literature, and provide confirmation of the presence of these mutations in NZ samples.

LAUREN CARR

Supervisor: Dr Matloob Husain, Microbiology and Immunology

PROJECT: Does host factor EP300 enable influenza virus infection?

Funder: Stonelake Foundation Scholar

ABSTRACT: This research aimed to investigate the possible proviral role that host gene 'EP300' plays during an infection with the 'pandemic potentiator' Influenza A Virus. Data produced by experiments where the expression of EP300 gene was depleted using genetic tools indicates that EP300 is a contributing factor to increased severity of Influenza A Virus infection. The results of this report add to the repertoire of research currently being undertaken in the Husain Laboratory surrounding this area, and they provide a significant piece to the ever-growing puzzle of possible new targets in the fight against Influenza A Virus. These results are particularly important in a world currently battling a pandemic caused by another respiratory virus – a battle that would be significantly harder in the event of a 'co-infection' pandemic.

MACY CATTELL

Supervisors: Dr Gregory Giles, Pharmacology and Toxicology

PROJECT: Investigating new metal-based drugs as anti-cancer agents

Funder: The Perpetual Guardian Foundation's McGillvray Brothers Scholar

ABSTRACT: Cancer cells rapidly divide and spread, causing many problems in our bodies. This project investigated how a new type of metal-based compound works at killing cancer cells. Firstly, an experiment was carried out to test how well this compound works at killing the cells at different concentrations. Then the cells were treated with this compound for different lengths of time to see how the area of the nucleus changed over time. This was to investigate how the compound actually kills the cells. The results were compared to two known compounds; another previously researched metal-based helicate, and a toxic agent called Menadione. This investigation showed that this new helicate has a lower potency and takes longer to act than the known helicate and Menadione. The results also showed that this new helicate acts differently to the known helicate, and has similarities to Menadione.

PARE (PAREARAU) GRAHAM

Supervisor: Professor Jo Baxter, Kōhatu – Centre for Hauora Māori

PROJECT: A study evaluating psychotherapeutic professional's understanding of kaupapa Māori approach to therapy.

Funder: The Perpetual Guardian Foundation's McGillvray Brothers Scholar

ABSTRACT: This research aimed to explore the way in which psychotherapeutic professionals understand and implement kaupapa Māori frameworks when working alongside Māori clients. The research involved a clinical psychologists and a registered psychotherapist. They were recruited to participate in an interview surrounding their professional training, their experiences working alongside Māori and their understanding of Kaupapa Māori frameworks. The interviews were then recorded, transcribed and thematically analysed. Findings suggested that mainstream clinical training does not emphasise the utilisation of kaupapa Māori approaches to therapy, and the need for cultural competence and cultural safety to be valued as equally as clinical competence across psychotherapeutic professions. This research project highlighted that there is a need for all psychotherapeutic professions to integrate Kaupapa Māori i frameworks and te ao Māori within their curriculum and

clinical training to better equip clinicians with the skills and tools to work with Māori. By doing so, this would improve the support and service delivery provided to Māori.

RAWIRI KAPA-HAKENEY

Supervisor: Associate Professor Ben Wheeler, Women's and Children's Health

PROJECT: No more finger pricks: Continuous glucose monitoring in adolescents with poorly controlled type 1 diabetes

Esperanz Summer Research Scholar

ABSTRACT: Youth with T1D typically have sub-optimal control of their glucose levels, which is linked with poorer health outcomes. Continuous glucose monitoring (CGM) – the latest of which is called Dexcom G6 (DG6) – is an alternative to finger prick blood testing – a burdensome and stigmatizing task required in diabetes to check glucose. No research on user experience of DG6 has been done because it is so new, particularly in New Zealand. This project was conducted on youth in multiple sites around NZ with poorly controlled T1D and aimed to uncover insights into the user experience of DG6. 2 interviews were conducted, producing early findings which suggest DG6 modified the frequency of glucose checking, made self-management of diabetes easier and had technical issues. These findings have allowed better understanding of how the technology is received in youth and contributes to the foundations for a continuing research project throughout 2021.

RUIKANG (RICCO) GUO

Supervisors: Dr Jack Dummer, Otago Medical School

PROJECT: The common brain mechanism of treatment effect of ketamine on treatment resistant generalised and social anxiety disorder

OMRF Iverach Scholar

ABSTRACT: The effect of chronic vaping on airways in young adults

In recent years, vaping has increased in popularity although its health effects on the lungs are not fully understood. This study was conducted in order to investigate the harmful effects of vaping, in the absence of traditional tobacco products and any respiratory disease, on the small airways of young adults. Using a technique called impulse oscillometry, which uses sound waves transmitted from the mouth through the airways, measures of small airways function were compared in two groups of young adults: vape users and non-vape users. The present study demonstrated no significant difference in the small airways resistance of the two groups. Reasons for this might include demographic differences between the groups and low numbers in the group of vape users. These findings will guide future investigations of this topic.

SARAH HANNAH

Supervisor: Associate Professor Paul Gardner, Biochemistry

PROJECT: Is my genome variant neutral?

Esperanz Summer Research Scholar

ABSTRACT: Genes required for life are very similar between species, and therefore have high conservation across the tree of life. For the most part this assumption is true; however, in the human genome there are regions of high conservation that also show high levels of sequence variation which suggests rapid evolution occurring in humans. I have found that these regions of high variation and high conservation are mainly in low complexity regions of the genome that map to multiple places. The results of this study highlight the importance of critically analysing the identified variants used to diagnose human genetic disorders, to ensure they are not in regions which map to multiple places resulting in a false association.

STEPHANIE BALDWIN

Supervisor: Associate Professor Pete Jones, Physiology

PROJECT: The Role of Channel Organisation in Alzheimer's Disease

Rosey McConnon Scholar

ABSTRACT: Alzheimer's Disease (AD) is the most common form of dementia; characterised by a decline in brain function and loss of behavioural control. An emerging hypothesis states that dysregulation of calcium-handling within the brain may link to the onset and progression of AD. This hypothesis arose from findings that show AD patients have elevated calcium (leak) in certain regions of the brain. The storage and release of calcium is highly regulated and depends on the organisation of specific transport proteins. Therefore, this study aimed to investigate the organisation of these calcium transport proteins in an AD mouse model. The results collected show that the number of transport proteins in the AD model was reduced, however, the overall organisation of these proteins remains unknown. Further research is needed to investigate protein organisation in AD, nonetheless, our results aid in piloting and optimising research into this novel area of AD pathology.

SYLVI LOW

Supervisor: Dr Francesc March de Ribot, Ophthalmology

PROJECT: Using Artificial Intelligence (AI) to detect diabetic retinopathy in New Zealand

Flavell Memorial Summer Research Scholar

ABSTRACT: Diabetic retinopathy (DR) is a common complication of diabetes mellitus that can lead to blindness if not treated promptly. With diabetes becoming more prevalent, our DR screening programme may struggle to meet the demand in the future. Many countries overseas have started to use Artificial Intelligence (AI) to screen for DR to improve its efficiency. We may be able to adapt those AI in NZ but their applicability in NZ

needs to be tested beforehand. Our study examined the applicability of Eyestar, an AI used in Mexico, in New Zealand by grading eye photos from the Otago Diabetic Eye Monitoring Service (ODEMS) with Eyestar and comparing the AI grades with human grades. From our preliminary result, we found that Eyestar's performance on the ODEMS data does not meet the requirement for a screening programme, therefore we concluded that it may not be suitable for implementation in NZ.

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 2020 there were 22 applications from the University of Otago (compared with 34 the previous year) totalling $745,475 and eight of these were funded at a total expenditure of $259,313 of which $80,000 was provided most generously by the Otago Community Trust. These grants commenced between August and October 2020 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 2021. The funded projects are summarised below:

(I) ANNUAL GRANTS

Professor Rachael Taylor (Department of Medicine, University of Otago)

Streaming before dreaming: how do electronic media influence sleep in children? - AG386

Sponsored by JN Lemon Charitable Trust

Using electronic media before bed leads to poor sleep, which in turn, impacts how well children function the following day. We don't currently know how much children are using electronic media in the evening (including after "lights out"), whether more interactive behaviours like gaming are worse than reading a book on your iPad, or whether using multiple devices at the same time have different effects on sleep in 10- 12 year old children. By using wearable and stationary cameras to objectively measure screen behaviours, we will be able to answer these questions, providing much-needed information for developing appropriate sleep health guidelines.

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

How much breast milk are New Zealand infants actually getting? - LA391

Sponsored by Aotea Holdings Group

Surprisingly little is known about what infants consume during their remarkable journey from drinking a 100% milk diet at birth, to eating the same foods as their family around their first birthday. In fact, even though breast milk is the main food for 69% of New Zealand babies until at least 8 months of age, we don't even know how much breast milk they are consuming. The First Foods New Zealand (FFNZ) study has been funded by the HRC to find out what and how New Zealand babies are being fed, but additional sample collection is required for accurate measurements to be made of the amount of breast milk babies are getting. This funding will enable FFNZ to collect these data.

Assoc Prof Aniruddha Chatterjee (Department of Pathology, University of Otago)

Understanding and targeting drug tolerance in lung cancer to prevent drug resistance - AG387

Sponsored by Margaret Begg Charitable Trust and Friends of the Foundation

Cancer drugs that target specific mutations have improved survival for some patients, but responses are usually short-lived and patients invariably suffer relapse with drug- resistant tumours. Previously it was thought that this was due to traditional Darwinian selection of pre-existing mutant cells. However, recently it has been discovered that some cancer cells in a tumour are able to adapt to a drug-tolerant state. These persistent cells then give rise to mutants during continued treatment. Whether they exist prior to treatment, are induced by the drug, or both, is not well understood. Here we will analyse the epigenetic characteristics of these cells to better identify and target them.

Dr. Daniel Pletzer (Department of Microbiology & Immunology, University of Otago)

Host response to mono- and polymicrobial infections in a mouse skin abscess model and treatment with an immunomodulatory peptide - AG388

Sponsored by Aotearoa Gaming Trust (formerly The Southern Trust)

Infectious diseases have traditionally been associated with individual microorganisms. However, recent progress in sequencing technologies revealed that many infections are mixed where two or more species of microbes occupy the same niche. This increases the severity of the infection and complicates treatment strategies. It is important to understand how the body reacts to individual and mixed infections to identify better interventions for complex infectious diseases. Our research will address this gap, investigating the response of a mouse host to various infections and we will investigate a novel treatment strategy, based on a small synthetic peptide, for mixed infection.

Dr. Shyamal Das (School of Pharmacy, University of Otago)

Delivery of a micro RNA based nanocomposite powder for treatment of Chronic Obstructive Pulmonary Disease - AG389

Sponsored by ADEPT-MACTODD Trust

Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of death worldwide. In New Zealand, it has the highest mortality of all respiratory diseases and is highly prevalent in M□ori. This is largely because

the current treatment of COPD has only limited efficacy. The aim of this project is to develop a novel gene therapy for COPD using an inhaled treatment. We will produce formulations containing a combination of molecular regulators and test them in the lab. This type of gene therapy has the potential to revolutionise the treatment of COPD.

Professor Peter McIntyre (Department of Women's & Children's Health University of Otago)

Immunity to measles in immunised young adults - is it waning and does it matter? - AG390

Sponsored by OceanaGold/Otago Medical Research Foundation

Measles is highly contagious, and non-immune health professionals are at risk of being exposed to measles and potentially infecting their patients. Despite previous immunisation, about 15% of health science students at the University of Otago do not have detectable measles antibody by standard tests. They receive another dose of measles-mumps-rubella (MMR) vaccine but are not re-tested. In 2021, we will invite students receiving a MMR booster to have new, more sensitive blood tests to check their immunity – an important first step in working out if waning immunity to measles is a problem, and if so what to do about it.

(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 two projects selected were:

Associate Professor Ben Wheeler (Department of Women's & Children's Health, University of Otago)

Does "Closing the Loop" improve sleep in those living with type 1 diabetes? - OCT379

People living with type 1 Diabetes need to ensure their blood glucose is well controlled to avoid short and long-term complications. New technology (undergoing clinical trials) acts like an artificial pancreas to do this. Our preliminary evidence that sleep improves using this technology will be explored further in a new trial of 60 patients; measuring and asking about their sleep, alongside interviewing a subsample about their experiences using this technology specifically related to glucose management and everyday living. The research will provide important information on the benefits of this state-of-the-art technology for improving sleep with wide implications for overall health.

Professor Fiona McDonald (Department of Physiology, University of Otago)

The Role of the Epithelial Sodium Channel (ENaC) in Breast Cancer Metastasis - OCT380

Breast cancer is the leading cause of death in women worldwide, with 90% of these deaths attributed to metastasis, the process whereby cells from the primary tumour migrate and invade a secondary site in the body. Our preliminary data has suggested that the epithelial sodium channel (ENaC), an ion channel with a role in the regulation of blood pressure, has a significant impact on key metastatic characteristics. Our research investigates the role ENaC may play in metastasis with a particular focus on how ENaC affects the speed of growth of breast cancer cells.

(B) LAURENSON AWARDS

Laurenson Awards are one-year grants for research concerned with the effects of diet and/or drugs on human health. In December 2020 there were 12 applications (compared with 7 the previous year) from the University of Otago totalling $346,975 and three of these were funded at a total expenditure of $79,726. All grants commenced on 1 February or 1 March 2021 and Abstracts from the final report will be available on the OMRF website **www.omrf.org.nz** mid 2022. The funded projects are summarised below:

Dr. Ailsa McGregor (School of Pharmacy, University of Otago)

How do curcumin analogues alter microglial phenotype post stroke? – LA392

Curcumin, the active ingredient of the spice turmeric, has moved from alternative to mainstream medicine as a possible treatment for cancer and inflammatory bowel disease. It has been suggested that curcumin could also protect against inflammation following injury to the brain. Researchers at Otago have developed a series of agents that are more powerful than curcumin itself. We have shown these new agents can 'switch off' brain inflammation in an experimental model of stroke. This project will investigate exactly how these new compounds produce their anti-inflammatory effects and the length of time after stroke that they could be effective.

Professor Sarah Hook (School of Pharmacy, University of Otago

Prevalence of antibiotic-resistant bacteria on retail chicken in New Zealand - LA393

Every year thousands of New Zealanders get gastrointestinal infections with diarrhoea and vomiting from eating improperly cooked chicken and/or handling uncooked chicken. This usually peaks over summer and there is some evidence to suggest this may be increasing. In some individuals these infections may need to be treated with antibiotics, however there is concern that some bacteria found in food such as chicken may now be resistant to the effects of common antibiotics. This project will survey the prevalence and antibiotic susceptibility/resistance of bacteria on fresh retail chicken in Aotearoa New Zealand. This data will be compared to historical research nationally and internationally and will provide important background information for further research in this area.

Dr Shyamal Das (School of Pharmacy, University of Otago)

Inhaled powder formulation for COVID-19 – LA394

Currently, there are no vaccines and proven approved treatment for COVID-19. The majority of therapeutic candidates that are in clinical studies do not show expected

outcomes although they showed efficacy against SARS-CoV-2 in preclinical studies. One of the reasons is an insufficient amount of drugs in the lung, which is the primary site of COVID-19 infection. We are in the process of developing an inhaled delivery system for potential anti-COVID-19 drug(s) that will inhibit the entry and replication of the virus in the lung, ensuring an effective treatment at lower doses while reducing potential side effects.

(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 2020 there were four applications (compared with two in the previous year) from the University of Otago totalling $119,172 and three of these were funded. All grants commenced on 1 February or 1 March 2021 and final reports are due at the end of April or May 2022. Abstracts from the final report will be available on the OMRF website **www.omrf.org.nz**. The funded projects are summarised below:

Professor Robert Walker & Dr Daniel Wright
(Department of Medicine and the School of Pharmacy, University of Otago)

The impact of peritoneal dialysis on oxypurinol and urate handling in gout patients - JT386

Gout is common in people with kidney disease who require dialysis to maintain kidney function. Medications such as allopurinol can help prevent Gout by lowering the uric acid levels in the body. At present we do not know how this drug is handled in patients who are receiving peritoneal dialysis nor what dose is safe and effective. We will measure the elimination of oxypurinol, the active produce of allopurinol, over a 24-hour period in 10 patients receiving peritoneal dialysis. We will use this information to predict the allopurinol dose required to lower uric acid concentrations to prevent gout.

Dr Ramakrishnan Mani (School of Physiotherapy, University of Otago)

Pain sensitisation and lived pain experiences in people knee osteoarthritis - JT387

Knee osteoarthritis is a common health condition which can result in pain and disability. The knee osteoarthritis pain experience is complex, with studies revealing that pain is less related to structural joint changes and more related to the sensitivity of the nervous system. Lived experiences and symptoms linked to the pain experience can be captured using smartphones as people go about their daily lives. This research aims to investigate the lived experiences of those with knee osteoarthritis using smartphones and determine if these are linked with pain sensitivity.

Dr Paul Hessian (Department of Medicine, University of Otago)

The fibroblast contribution to rheumatoid arthritis - JT388

The underlying disease mechanisms driving extra-articular inflammation in rheumatoid arthritis (RA) are unknown. Rheumatoid subcutaneous nodules are extra-articular lesions associated with severe RA. Recent investigation of rheumatoid nodule tissues revealed evidence of fibroblasts contributing to inflammation in nodule lesions. This study will investigate the contribution from a unique "intermediate" fibroblast subtype and contribute to our understanding of the causes of rheumatoid inflammation and the potential for new therapeutic strategies that will benefit patients with this disease.

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 2020** scientific meeting of the Otago Medical School Research Society (OMSRS) there were 10 **doctoral** candidates.

The first Prize ($1,000) funded by Otago Postgraduate Medical Society was awarded to **Hamish Aitken-Buck** (Department of Physiology) for his presentation on the topic of *"Arrhythmogenic and inotropic effects of long-chain acylcarnitines in the human heart"*

The second prize ($500), which was funded by the OMRF, was awarded to **Abigail Bland** (Department of Pharmacology and Toxicology) for her presentation on the topic of "*Repurposing the hypoglycemic agent, metformin, for targeted lung cancer*".

(2) At the May 2021 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 **Hua Shin** Tan (Dept of Preventive and Social Medicine) for their presentation titled *"Cannabis and small airway function in mid-adult life."*

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 2021 recipients were:

"Fit bit or Fib-bit" by Monty McGee, Tahuna Normal Intermediate (Year 7),

"Harakeke Gel, Healer or Hoax?" by Tessa Krause, Tahuna Normal Intermediate (Year 7)

"What drinks will drain your brain?" by Riley Elliot, Fairfield School (Year 7)

The Foundation's judges were Drs Heather Cunliffe, Sarah Baird, Nick Heng and associate professor Rajesh Katare.

ACKNOWLEDGEMENTS

The Foundation continues to play an ever-increasing role in funding Medical Research in Otago. The last two 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 2021

EVENTS

GALA - Friday 12 February 2021

The spectacular Gala evening held at the Town Hall on Friday 12 February, proudly supported by Major Sponsor OceanaGold, was the Foundation's ninth annual fundraising black-tie event.

MC Doug Kamo, with us for the first time, opened the night with flair. A fantastic night of music, comedy, dancing and laughter was enjoyed by the entire audience.

We were delighted to introduce Epidemiologist, Professor Michael Baker, as our Face of Research for 2021, the man who we had all learned so much from through our screens over the last year was in awe of being able to present to a full house in person. Professor Baker's talk was entertaining and further enlightened us all about the COVID-19 pandemic to date.

Comedy act Zane and Degge had the audience in awe as they juggled large items while chatting and making us laugh, and we were all holding our breaths along with the brave volunteers from Forsyth Barr who were included in the act.

After a delicious main course, Auctioneer extraordinaire Rob Fowler joined us again for 2021. We placed him square on centre stage to auction all the generously donated items and there were some very happy bidders at the end of the night. Along with our raffle the evening raised a generous $50,000 towards our work funding medical research in Otago.

After the success of the auction the party continued and we were toe tapping, clapping and singing along with Doug Kamo, Simon Green and Paul Ross who brilliantly performed their Rat Pack tribute act with the superb accompaniment of the St Kilda Brass Band. They really took us to the true essence of the 1950/60's big band experience!

We extend our sincere thanks to all our sponsors and to the businesses and individuals who donated auction and raffle items, as well as the bidders and winners that were rewarded for their generous support.

We are so grateful to all that supported the Foundation by attending the Gala, and we can conclude by the huge crowd on the dance floor for the whole two-hour set from LA Social that a fantastic night was had by all.

As always, the night would not have been the success it was without the expertise from the staff and Dunedin Venues, Strawberry Sound, Compass Catering and our photographer Chris Sullivan — a huge thank you to all that contributed to the evening.

SPONSORS:
Major Sponsor: Oceana Gold
Associate Sponsors: Vero Liability and The Southern Trust (now Aotearoa Gaming Trust)
Supporting Sponsors: Forsyth Barr, Walsh and Beck, Select Recruitment, Anderson Lloyd, Misha's Vineyard, Nova, Dunedin City Council, BayleysMetro – Sharon Hyndman and Kees Meeuws.

Auction donors: Misha's Vineyard, Blanket Bay Lodge, Tyler Kennedy Stent, Vault 21, Oxbow Adventure Co., Crowne Plaza Queenstown, Armstrong's Volvo, Sir Michael Hill, Prohibition Smokehouse, The Artists Room, Regus Dunedin, Nova Café.

Our raffle donors were: Ora King Salmon, David McLeod, Klone, PaperPlus Dunedin, Rialto Cinema Dunedin, Estelle Flowers, Allpress Coffee, Regus Dunedin.

ANNUAL GOLF DAY - 2020 and 2021

2020: A beautiful sunny Sunday at the picturesque St Clair Golf Course ensured that the 11th annual Foundation Golf Day was set to be a success.

Once again, Oceana Gold as the major sponsor for the tournament ensures a generous contribution to new research products, and while a smaller field joined us for the day this year, due to a shift in date to work within COVID Level 1, the charitable nature of all on course allowed us to continue this fantastic tradition with the event.

As well as the support from Oceana Gold we are very appreciative of the contributions from our Hole Sponsors and we would like to thank Calder Stewart, Polson Higgs, Stewart Construction, Forsyth Barr, Dr Alan Wright, Palmers Mechanical, Deloitte, Prosigns, Telfer Electrical Otago, Cowell's Pavlova, RD Petroleum and Dr Simon McMahon.

We would also like to thank the local businesses who supported the day by providing a wonderful range of prizes. Thank you to Patrick Moore – St Clair Golf Pro, Dunedin Casino, Meenans by Liquorland, The Highlanders, St Clair Golf Course, Sharon Hyndman (BayleysMetro), Vault 21, Rialto Cinema, Paper Plus, Allpress, Ken Dempster and Marianne Quinn.

And the day would not be complete with the individual teams who strengthen the day, we appreciate the support of the following, Whatsoever Ltd, Aotea Electric, Ken Dempster, Abbott Insurance Brokers, Myers Marketing, and members of the St Clair Golf Club.

As always it was a tight competition out on the field and there were only 3 strokes between the Top 8.

TEAM RESULTS:

- 1st: playing off a handicap of 8.5 and finishing with a net score of 51.5 – Abbott Insurance Brokers
- 2nd: 7.25, 51.75 - St Clair Pro Shop Team
- 3rd: 6.875, 52.375 – Aotea Electric
- 4th: 4.625, 53.375 – Myers Marketing (on count back)
- 5th: 9.625, 53.375 – Polson Higgs
- 6th: 3, 54 – Forsyth Barr
- 7th: 6.375, 54.625 – Calder Stewart
- 8th: 3.125, 54.875 – Whatsoever Ltd

OTHER RESULTS:

- Closest to the Pin: 4th-Tony Cutler; 7th - Geoff Paterson; 13th – Will Young, 16th – Hayden Ryder.
- Closest to the Pin, 2nd shot on 11th: Jason Smith

2021: Based on our supporter feedback this year saw a change to a Friday in May for the annual Golf Day.

Held Friday 14 May 2021, at the St Clair Golf Course. We had 29 teams join us on the day, which started well due to the sunshine and complimentary coffee from Strictly Coffee and the Village Green.

Unfortunately, extreme high winds lead to course closure halfway through our day. The St Clair staff ensured the rest of the day in the Club House went as smoothly as possible.

Teams stayed and purchased raffles and enjoyed a modified prize giving. Professor Peter McIntyre was kind enough to give us his time to address the room and discuss his research on measles and immunisation in young adults.

Thanks to all our sponsors and teams that made our Annual Golf Day with OceanaGold possible, in spite of challenging conditions.

OceanaGold Macraes Operation, Calder Stewart, Deloitte, Armstrong's Volvo Car New Zealand, Craigs Investment Partners, VAULT 21, Edinburgh Realty Ltd, Stewart Construction Ltd, Select Recruitment, Grand Casino, Platinum Recruitment, University Book Shop Otago, Mitre 10 MEGA Dunedin, Challenge Marketing Ltd, Patrick Moore Golf, St Clair Golf Club Inc, The Wildlife Hospital - Dunedin, Larnach Castle, Polson Higgs, Gone Potty, The Body Shop, The Warehouse, RD Petroleum Ltd, Village Green Cafe & Bar, Forsyth Barr, Strictly Coffee.

Sarah Rickerby - OMRF Events Manager

CLUB OTAGO

After a pause in the Foundation's Club Otago lunch series due to COVID-19 restrictions for most of 2020 we were excited to continue the popular events with a renewed vision in December.

Club Otago has been a feature on the fundraising calendar for the Foundation since 2012, with over $700,000 generated through memberships, and additional tickets purchased as our members ensure that the great work of the Foundation is highlighted to their clients, staff and friends the Otago community. We are grateful for the opportunity to extend our audience at each lunch.

JOIN US

To join 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 of Club Otago is open to anyone. Membership fees cost as little as $250 per year, of which all goes towards funding medical research.

We ended 2020 with Associate Professor James Ussher speaking to the membership about the development of the vaccines for SARS-CoV-2 that had taken place in 2020 to bring a vaccine to a reality in a short time. James's presentation was engaging and articulate and left us all a lot more informed about what is next to come in the fight against COVID-19.

Club Otago in 2021 kicked off with local sporting legend, NZ White Fern Suzie Bates, who shared some personal insights into her sporting career and how she had to adapt her career through injury and a nationwide lockdown.

We welcomed Stuff CEO and Owner Sinead Boucher in June, sharing the journey that led her to purchase Stuff Ltd for $1 in 2020 – COVID-19 restrictions in place at the time meant that Sinead joined us via ZOOM, but her presentation was engaging and interesting none the less. Her mantra of *kia tūpeke te toa* – let the brave leap, left us inspired.

And after a year in the planning the Foundation was thrilled to have Dr Ashley Bloomfield as our special guest in August 2021. Throughout a captivating discussion with Melanie Kerr and our audience of over 200 members and their guests, Dr Bloomfield spoke of his career and the initial pandemic response, as well as some personal insights. He spoke highly of the research that is taking place in New Zealand and updated us on the vaccine rollout.

Our members in the 2021 year were:

PATRONS

SENIOR FELLOW

Calder Stewart

FELLOW

Ross & Bev Middlemass

Deloitte

Allied Press

McMahon Investments

Carpet Court Dunedin

RD Petroleum

ASSOCIATE FELLOW

Forsyth Barr

Fulton Hogan

SF Waller Family Trust

Living Corporation

Brian Stevenson

Moore Markhams Otago

Harvie Green Wyatt

Storesafe Dunedin

Grand Casino

INDIVIDUAL

Trevor Millar
(Cowell's Pavlovas)

Mary Arnesen; Shirley Laney & Monica Urquhart

Janine Young

Jenny Soper
(ANZ Private)

Wyn & Dorothy Chirnside
(Werribee Trust)

Michael Milne
(Craigs Investment Partners)

Barbara Bridger *(Otago Community Trust)*

Octagon Dental Suite *(Yash Khan)*

Otago Orthodontics
(Emily Lam)

Hudson Biggs
(Accounting & Finance Ltd)

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)

Ross Gamble
(Roslyn Storage)

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

Richard Roberts
(Dunedin Airport)

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
(Paper Plus Dunedin)

Kristi Waldron
(Polson Higgs)

Dr Paul Templer
(Sandman Anaesthesia Services)

Signature Property
(Neil & Jamie Lyons)

Sergio Salis
(London Street Specialists)

Graham Helm
(Crombie Lockwood)

Judy Bevin
(J Bevin Ltd)

Sarah Ramsay
(Immersion Ventures)

Andy Campbell & Ian Anderson
(Knox & Anderson)

Darryn Wilkie
(Otago Properties 2018 Ltd)

Steve Brocklebank
(BB&S)

Robert & Jill Reid

Ant & Chris Wither
(Awhirk Farms)

Dr Norman & Mrs Barbara Fitzgerald

Ray Grubb
(Morgan GR Tourism Management)

Steve Cogger
(Black Rock Consulting)

Donna Gale
(NZI)

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 2021. 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 2021 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 2021

	2021 $	2020 $
Operating Income		
Donations, Bequests, Subscriptions	437,210	700,743
Investment Income	165,320	234,111
Gain on Disposal of Investments	57,580	-
	660,110	**934,854**
Less Expenses		
Administration	110,616	104,417
Promotion Costs	301,131	339,513
Loss on Disposal of Investments	-	41,530
Total Expenses	**411,747**	**485,460**
Net Surplus before Research Grants	**248,363**	**449,394**
Research Grants approved during the year	617,494	529,956
Net Surplus for the year	**(369,131)**	**(80,562)**

Statement of Financial Position

As at 31 March 2021

	Market Value	2021 $	2020 $
Current Assets		**213,948**	**220,022**
Investments	**6,411,297**	**4,897,181**	**5,217,804**
Total Assets		**5,111,129**	**5,437,826**
Current Liabilities		**265,415**	**222,980**
Total Liabilities		**265,415**	**222,980**
NET ASSETS (EQUITY)		**4,845,714**	**5,214,846**

Statement of Cash Flows

For the Year ended 31 March 2021

	2021	2020
	$	$
Net Cash Flows from Operating Activities	(377,078)	(113,128)
Net Cash Flows from Investing Activities	377,412	70,829
Net Increase / (Decrease) in Cash Held	**334**	**(42,299)**
Cash at the Beginning of the Year	160,573	202,872
Cash at the End of the Year	**160,906**	**160,573**

Statement of Service Performance

For the Year ended 31 March 2021

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:

	2021 Number	2021 Actual ($)	2021 Budget ($)	2020 Number	2020 Actual ($)
Annual Grants	6	169,632	170,000	6	172,654
Annual Grants - Covid	3	74,251	-	0	-
Special Fund Grants	7	176,164	180,000	6	173,504
Summer Research Scholarships	18	112,000	110,000	25	142,000
Otago Medical Research Society Award Sponsorship	4	7,450	7,000	2	1,000
Total	**38**	**$ 539,497**	**$ 467,000**	**39**	**$ 489,158**

The full financial report of the Otago Medical Research Foundation for the year to 31 March 2021 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

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44 York Place
Dunedin 3016
PO Box 188
Dunedin 9054

Tel +64 3 477 5790
Fax +64 3 474 1564
www.crowe.nz

Report of the Independent Auditor on the Summary Financial Statements

To the Council of Otago Medical Research Foundation

Opinion

The summary financial statements, which comprise the summary statement of financial position as at 31 March 2021, the summary statement of financial performance, the summary statement of cash flows, and summary statement of service performance for the year then ended, and related notes, are derived from the audited financial statements of Otago Medical Research Foundation (the "Foundation") for the year ended 31 March 2021.

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 13 July 2021.

Other Information

The Council are responsible for the other information. Our opinion on the summary financial statements does not cover the other information included in the annual report and we do not and will not express any form of assurance conclusion on the other information. At the time of our audit, there was no other information available to us.

In connection with our audit of the summary financial statements, if other information is included in the annual report, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed on the other information that we obtained prior to the date of our auditors' report, we concluded that there is a material misstatement of this other information, we are required to report that fact.

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 13th day of July 2021

GET INVOLVED, SUPPORT MEDICAL RESEARCH

Medical research benefits so many people. If you'd like to get involved by attending an event, donating, making a bequest, or sponsoring a summer scholarship you can complete the form below or go to our website to learn more.

I/we want to support the Otago Medical Research Foundation

Name(s): _____

Postal Address: _____

_____

Email: _____

Phone: _____

◯ Yes, please send me information about making a bequest

Please sign me/us up for a:

◯ one-off ◯ weekly ◯ fortnightly ◯ monthly

payment of $_____

PAYMENT METHOD

☐ **Credit Card**

Card Number: _____

Name on Card: _____

Expiry: __/__/____ Signature: _____

☐ **Internet Banking Payment**

Account Name: Otago Medical Research Foundation
Account Number: 01-0815-0104572-00
Please use your last name and "Donation" in the reference line.

◯ We publish the names of our donors on the Foundation's website and in its annual report. Tick here if you prefer to keep your donation anonymous.

Otago Medical Research Foundation
P.O. Box 5726, Dunedin 9054
P +64 3 477 8977 **E** info@omrf.org.nz

Charities number: CC33444

OMRF.ORG.NZ

Otago Medical Research FOUNDATION

Annual Report to 31st March 2021
& Notice of Annual General Meeting

Charities Number: CC33444

OMRF.ORG.NZ