Otago Medical Research FOUNDATION

2019 Annual Report

FUNDING DISTRIBUTION

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

SUMMER SCHOLARSHIPS


Antibiotic Resistance **$5,000**


Brain **$4,000**


Fertility/ Brain **$4,000**


Heart **$8,000**


Diabetes **$12,000**


Cancer **$24,000**


Gut Health **$8,000**


Immunity/ Microbiology **$13,000**


Bacteria **$4,000**


Blood Testing **$4,000**


Community Health **$4,000**


Oral Health **$12,000**


Fertility **$4,000**

ANNUAL GRANTS


Drug Development **$65,607**


Neuro/Brain **$10,000**


Antibiotic Resistance **$33,652**

OTAGO COMMUNITY TRUST


Cancer **$34,954**


Drug Development **$35,000**

LAURENSON BEQUEST


Cancer **$30,000**


Neuro/Brain **$25,000**


Nutrition/Diabetes **$26,477**

JACK THOMSON BEQUEST


Joint pain **$34,680**


Arthritis **$44,452**

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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.

The Foundation was founded in 1967 to further medical research in Otago and we have now funded over $9 million dollars in 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.

WE FUND:

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 12.

FUNDING ALLOCATION

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 impact as we work to deepen the 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." - *Anonymous*

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

CHAIRPERSON'S REPORT

2019 GRANTS TOTALLED
$407,782

TOTAL AMOUNT FUNDED*
$9,305,750
*Since the Foundation's inception

It is with pleasure that I present the 51st Annual Report on the Otago Medical Research Foundation's activities for the 2019 financial year.

During the year under review, the Foundation approved Grants totalling $407,782 an increase of $46,511 on last year's total of $361,271. Since the Foundation's inception, a total of $9,305,750 has been spent on Medical Research in Otago.

The extract from the Financial Statements, as published elsewhere in the Annual Report, shows a surplus for the year of $196,223 compared with a surplus for the previous year of $159,202, $37,021 better than last year. Total Operating Income increased $71,459 while Expenses decreased by $12,073 and Grant expenditure increased by $46,511, Last year's income included a one off Legacy of $152,979 and this year there was a realised gain of $158,318 on sale of shares. It would be good to see an increase in the receipt of further injections of capital for investment, which would to help counter the reduced investment rates that we earn on our conservatively invested funds.

The Investment Sub-Committee has continued to face the challenge of finding suitable low risk investments while acknowledging that income and growth are also important. The reinvestment of maturing fixed interest investments remains a major challenge. 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 $982,616, which is 32.14% of cost.

At 31 March, 2019, Accumulated General Funds total $420,482 and Accumulated Special Funds $4,874,928 a total of $5,295,410 both these figures comprising Capital and Income.

This year marked the 22nd 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 $1,561,000, 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 22 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.

"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."

COUNCIL MEMBERSHIP:

Changes in Council since the 2018 Annual Report are as follows:

Mike Horne, who had been the Deloitte representative on Council since 2003, advised Council in December, 2018 that due to a role change at Deloitte, which would involve a substantial amount of travel, he would be handing over his responsibilities for the Foundation to Jamie Adamson, who was a recently appointed Director at Deloitte. Jamie has since been appointed a Partner at Deloitte, effective from 1 June, 2019.

On behalf of Council and personally, I would like to thank Mike most sincerely for his contribution to the Foundation over 16 years.

Following Pat Cragg's retirement last year, the practice of appointing the Chairperson of the Scientific Committee to the Deputy Chairperson's role was followed and Prof Greg Jones was appointed.

Sarah Ramsay, who had been a Co-opted Member of Council, advised of her resignation in November, 2018 and on behalf of Council I thank Sarah for her contribution to the Foundation since she was co-opted on 8 April, 2014.

In January, 2019 I was advised that The Otago Medical School Research Society (OMSRS) had elected a new President, Dr Sarah Baird, Department of Pharmacology and Toxicology and that she would be replacing the Past President, Dr Lyn Wise, on both the OMRF Council and Scientific Committee. I welcome Sarah to both Council and the Scientific Committee and thank Lyn for her contribution to both Council and the Scientific Committee since March, 2017.

Dr Heather Cunliffe, who was appointed Deputy Chairperson of the Scientific Committee at a Council Meeting on March 12, 2019, then became an Ex –Officio Council Member as a result of a change in the Constitution approved at the 2018 AGM, held in September 25, 2018. I welcome Heather to the Council table and am sure that her contribution will be most appreciated.

CHANGE OF CONSTITUTION

Last year's Annual Report noted that some changes were to be considered and voted on at the AGM. The proposed changes, which were to reflect name changes within the University, matters relating to the Deputy Chairperson of the Scientific Committee, changes in technology, fine tuning of some administration matters and the position and rights of Employees and Contractors to attend Council Meetings were all voted on and passed at the AGM.

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 times.

To the Foundation's Director of Development, Susan Sims and our Events Manager, Steve Davie, who are the faces and voices of the Foundation, my sincere thanks. Your efforts in raising the profile of the Foundation and funds for research during the year are really appreciated. Susan's and Steve's reports can be found on page 7 and pages 22-25 respectively.

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

To all Council Members, and our Patron, Emeritus Professor Gil Barbezat, for your contribution and support, my sincere thanks for your continued interest in, and work done, for the Foundation.

To my fellow Investment Sub-Committee members, Judy Bevin, Michael Milne, Mike Horne for part of the year and then 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 Mike Horne for part of the year, then Jamie Adamson, Josh Cuming 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 works quietly in the background, ensuring that the Foundations day to day requirements are attended to in a timely and professional manner which is very much appreciated.

This report signals the start of the 2nd 50 years of the Foundation and we look forward to a continuation of our activities relating to "The furtherance of medical research in Otago".

On behalf of the Council

Ken Dempster
Chairperson

PATRON GIL BARBEZAT

Otago Medical Research Foundation Patron Gil Barbezat has been connected with the Foundation for many years, and he's full of admiration for the doors it continues to open.

Swiss-born Gil's initial medical education was in South Africa - his first study as a young physician-researcher investigated gastro intestinal function in malnourished children there.

Publications from that research enabled him to secure a post in a prestigious research centre in Los Angeles set up to study hormones affecting digestion, opening doors to valuable international research collaborations.

He and his wife and family relocated to New Zealand in 1978, continuing the research interests he had developed in Cape Town.

The now Emeritus Professor of Medicine sought OMRF funding for trials not long after he set up a gastrointestinal research lab in the University of Otago Medical School at that time. "The beauty of OMRF funding to initiate a project meant we gained proof of concept, which meant we could then qualify for a larger Health Research Council grant to take it further."

The OMRF went on to fund several of his New Zealand-based projects, as well as a number of his Summer Student Scholars and research fellows.

His distinguished research career has since taken him around the world. He has contributed important information to the understanding of the role of hormones and their gut receptors, and on the effect of medications which act on these receptor sites to produce significant therapeutic benefits to patients.

Members of the University of Otago clinical teaching staff in medicine are required to maintain clinical expertise as well as conducting teaching and research. Practising as a consultant gastroenterologist in Dunedin provided Gil with a real connection between patients and clinical practitioners and informed his teaching and research programmes.

"Research-informed teaching is vital in the training of doctors; we all need to appreciate the value of solid science as well as the art of dealing sensitively with complex human situations. It takes a team to translate research into clinical practice – I liken each team member's contribution to notches on a key. Without every notch the key is not going to unlock what we need to know – it is no longer worth trying to do it all on your own."

PHOTO CREDIT: Alan Dove

Gil has also chaired a number of research committees, including the OMRF Scientific Committee, which gave him an insight into some world class research.

As much as he has been impressed by the many research projects the OMRF has invested in over the years, he is equally proud of their student summer scholarship support. "The OMRF relationship provided a very necessary foot on the first steps of a research career."

"These students have been given an opportunity from a young age to appreciate what is required for good research. This encompasses giving them a taste of science, and the discipline and outlook needed to complete a project successfully, which has paved the way for many to carve out successful research careers."

"I've enjoyed following their progress, including for example, that of Professor Terrie Inder, now holding a prestigious chair in Paediatric Genetics at the Harvard Medical School in Boston."

"The scholarships also introduce students to the necessary science-based networks – I know from experience these links are so very important to open doors."

As the Foundation's Patron, Gil enjoys an ongoing interest in medical education and research, and in community affairs.

> "...giving them (students) a taste of science, and the discipline and outlook needed to complete a project successfully, which has paved the way for many to carve out successful research careers."
>
> GIL BARBAZET

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 Michele Coleman
Dr Alison Cook
Mr K G Dempster
Dr J M Faed
Fairmaid Chance & Crawford
Mr Malcolm Farry
Dr Peter Gootjes
Dr A Goulding
Assoc Prof Merilyn Hibma
Mrs L Homersham
Mr M Horne
Dr JB Howie* (deceased)
& Mrs ER Howie
Mrs N S Jones
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 *
Mr T J Williams
Dr R A Wright
Dr M E Wyatt
Dr A I Yelavich

** 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
Mr & Mrs L J Brown
Dr 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

Medical research is often a long game, however, the immediate impact of the Foundation continues to improve with both our annual grant projects and with a record 25 student summer scholarships funded.

These scholarships allow the students to work in a lab on a research project through the summer and are highly sought after with 120 applications received for 2018/2019. 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 Scientific Committee, headed by Professor Greg Jones, assesses each and every application for research funding and scholarships, and selects the very best to ensure that the Foundation is supporting the students, researchers and innovative projects which will have genuine impact. I am very grateful for all the work of the committee.

My sincere thanks to the OMRF Council, a committed group of highly skilled governance experts chaired by Ken Dempster, who bring a variety of business and academic skills to the OMRF table, and to Steve Davie, our Event Manager who continues to build on his success with our major events, the Night to Remember, Club Otago and golf day, to bring in funding so necessary for the Foundation. I'm grateful for the contributions and advice from Sarah Ramsay, Mike Horne and Dr Lyn Wise who have stepped down from the Council, and welcome Dr Heather Cunliffe and Jamie Adamson as they begin their work with us.

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 Zoe Robson who does great work behind the scenes for us on our website and social media accounts.

In 2018 the OMRF joined with the other New Zealand Medical Research Foundations to fund a small media campaign to broaden awareness of medical research in New Zealand and the work our researchers do. The national Foundations work together where possible and share information and best practices.

In celebration of the Foundation's 50th anniversary we hosted a number of special events to help us build the profile of the research work and to bring the researchers to talk about their work. Events were held in Dunedin, Queenstown and Wanaka and have led to more interest in and funding for the Foundation. It's great to have our supporters meet with our researchers to hear their research stories. Our supporters can see how their generosity leads to tangible improvements in understanding, diagnosis and treatment of a wide range of medical conditions which impact our families and friends.

To finish, I'd like 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 $35000, 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

"It's great to have our supporters meet with our researchers to hear their research stories. Our supporters can see how their generosity leads to tangible improvements in understanding, diagnosis and treatment of a wide range of medical conditions which impact our families and friends."

FUNDS RECEIVED

A Night to Remember
$105,785

Community Grants and Donations
$275,920

2018 Golf Tournament
$21,170

Club Otago
$94,665

$512,519

Bequests
$14,979

DONATIONS:

F J Austin

Mike Bird & the Friends of the Foundation

J Burton

Caversham Pharmacy

S O Chin

K Dempster

J M Faed

Howard & Jane Fraser

J Mortimer

R & B Middlemass

CF Sims *(in memory of)*

SpecSavers Dunedin

W Sutherland

Ryan Sutton *(Stantec)*

C & J Trotman

Walsh & Beck

Dr & Mrs GP White

S Wilkinson

T J Williams

Yarrow South Trust

GRANTS:

Margaret Begg Charitable Trust

Deloitte

Findex Community Fund *(Crowe Horwath)*

A Goulding

EMM Haynes Charitable Trust

The Healthcare Otago Charitable Trust

MM & JH Hughes Trust

JAD Iverach Memorial Fund

Kingston Sedgefield Charitable Trust

J N Lemon Charitable Trust

Lions Club of Dunedin South *(Administered by Perpetual Guardian)*

The Lion Foundation

The Otago Community Trust

Otago Southland Diabetes Research Trust *(Administered by Perpetual Guardian)*

Paper Plus Dunedin

The Southern Trust

The Stonelake Family

Southern Victorian Charitable Trust

BEQUESTS:

Ethel Johnston Charitable Trust

OMRF SUPPORTER AND RESEARCHER PROFILES

RESEARCHER SPOTLIGHT
DR HEATHER CUNLIFFE

Funding by the Otago Medical Research Foundation has opened doors for Dr Heather Cunliffe's breast cancer research.

Treatment is no longer one-size-fits all. Targeted treatments are already tailored to women according to three important gene markers that help define what fuels their breast cancer. Tailoring the right treatment to block a cancer's fuel makes a tremendous difference to patient survival.

But Dr Cunliffe, based in the University of Otago Department of Pathology, says for the 12 percent of women in New Zealand diagnosed with breast cancer that is negative for all three markers (known as triple negative), chemotherapy is the only drug treatment option.

Dr Cunliffe and her US collaborators discovered that a marker called the androgen receptor –important for guiding drug treatment in prostate cancer – is positive in 25 percent of all triple negative breast cancers. This offered an attractive new targeted treatment opportunity.

Anti-androgen treatment proved successful in about half of the cases, but showed only a partial response in the remaining cases, leaving unanswered questions.

Dr Cunliffe, who studied in Dunedin but has trained and worked in the US for 15 years, is now looking at the underlying genetics and biology of these cancer cells to define how to effectively target the partial-response cases to the anti-androgen drugs.

With funding support from the Otago Community Trust through the Otago Medical Research Foundation, she studied the biology of triple negative, androgen receptor positive breast cancers and developed a novel combination of treatments that successfully killed these cancers in the laboratory setting.

It's hoped the next step is clinical trials, leading to more accurate diagnoses and smarter combination treatments that could significantly impact survival all for patients diagnosed with triple negative, androgen receptor positive breast cancer.

She says the oncology world is now very focused on precision therapy approaches which treats the biology observable in each patient's cancer. "Tests ultimately won't just diagnose cancer, oncologists will be able to identify the specific factors that are fueling each individual patient's cancer, so that treatment can be tailored to target and kill their cancer cells."

"We have the tools to now address very complex issues in cancer management, thanks to cutting-edge technologies born since the decoding of the Human Genome in 2003. It's an exciting time to be a researcher, and there's tremendous new hope for cancer patients."

"I'm grateful for the funding to pursue this work, because it produces peer- reviewed results that other funding bodies take notice of, attracting further investment and support to move new discoveries toward clinical practice."

SUPPORTER SPOTLIGHT
SHARON HYNDMAN

As a former nurse, Sharon Hyndman knows only too well the impact serious disease can have, on the patient and wider family.

And as a family member who has experienced the effects of medical events and disease, including heart attacks and cancer, she is well aware of the heartache that actually means.

So when she went to consider what charity she should support as a real estate agent for BayleysMetro, Sharon's thoughts turned to research.

"There are many opportunities to help different organisations that are all deserving. But to me, sponsoring the Otago Medical Research Foundation is a good choice – it fits with my thinking of stopping disease before it takes hold," she said.

"I'm fascinated by how much research has already contributed to health improvements since I left the profession, and in awe of the health studies being done here that are continuing to contribute to change. We're lucky with having the University of Otago and the teaching hospital in Dunedin."

"Being a member of the Foundation is not that big a financial commitment but to me the payback is considerable."

"We all want to see a cure for serious diseases - being a small part of that process by supporting the Foundation's endeavours is a rewarding way of contributing to making a difference, here and potentially globally. To me, it's future proofing for the next generation."

Dunedin-born Sharon has been a foundation member since 2014 and is a sponsor of its Night to Remember event.

She also looks for ways to help where she can, as the functions are enjoyable, an excellent way to network, and interesting. "It's great to listen to some of the young researchers speak at the various Foundation events – not only from a health perspective, but also because there is a sense of pride at what we can do in Dunedin. It's another slice of humanity."

RESEARCHER SPOTLIGHT

PROFESSOR HAXBY ABBOTT

Funding from the Otago Medical Research Foundation's Jack Thomson Bequest is helping to make a difference to people with chronic joint conditions.

The Foundation has been supporting studies by Professor Haxby Abbott, whose research interests lie in better care for people with bone, joint, and movement problems.

Professor Abbott is the Director of the Centre for Musculoskeletal Outcomes Research, a multi-campus research network based in the Dunedin School of Medicine Department of Surgical Sciences. His research expertise is in clinical trials of treatments for joint health problems, as well as economic evaluation of cost-effectiveness.

His research on treatments for hip and knee osteoarthritis has been taken up by the Dunedin Hospital Orthopaedic Surgery Department, through the establishment of 'the Joint Clinic.' This aims to meet the needs of people whose osteoarthritis is not severe enough to qualify for joint replacement surgery.

Professor Abbott's most recent OMRF-funded projects, alongside Dr Ross Wilson, include a study of the health impact of osteoarthritis on health-loss and a study of chronic opioid use following joint replacement surgery.

Some results from this research show that knee osteoarthritis has a broader impact on people than simply pain and physical function; it also has a significant impact on peoples' work and family roles, emotional health, and vitality. This information can be used to estimate the broader impacts on people's health of knee osteoarthritis.

They also examined chronic opioid medication use, which is at crisis point in some countries, finding that many people remained chronic opioid users even many months to years after their joint replacement.

Professor Abbott says having the support of the Foundation has meant they have been able to improve their ability to conduct large-scale national research.

"Having scaled-up studies is important because the results clearly show magnitude of a problem from a national-level perspective, giving the results greater context to policy-makers and national non-governmental organisations to prioritise problems and formulate solutions."

"As a researcher, it means we can ask big 'what if' questions about the potential health and economic effects of a range of alternative solutions, and the future effects of failing to act, to help the health system make better decisions."

"And ultimately this will lead to better care strategies for people with osteoarthritis, better quality of life for people with this disease, and better value for money for the health care system and society."

SUPPORTER SPOTLIGHT

MIKE BIRD

Mike Bird has been in business in Dunedin all his working life and now that he is semi-retired, he says life is busier than ever.

Mike operates a storage company with his wife Sue and feels extremely lucky to have his daughter and grandchildren living close by in Dunedin.

In his spare time, he helps the Otago Medical Research Foundation with fundraising, and is an avid fan of the Highlanders, Otago and the All Blacks – in fact any team or sports person who can beat the Aussies. He has always had an interest in cars, motor sport and new and vintage vehicles.

Mike is passionate about Dunedin and would never consider living anywhere else. He believes in 'giving back' and donates regularly to various charities including the Foundation, an organisation he is particularly enthusiastic about.

Four years ago, Mike and a friend initiated 'The Friends of the Foundation', specifically to raise funds for the Otago Medical Research Foundation.

To date they have raised around $100,000 for medical research and he is keen to dedicate future donations towards cancer research, having lost several family members to cancer including his eleven year old nephew and his late mother, Belle.

While you are reading this, he suggests you may want to pause and consider how cancer has affected someone in your life – your family, mates, friends or sports team members.

"There are very few of us who have not been affected by this disease in some way, which is why it's so important to work together to help the fight," he said.

"Research continues and we have some exciting developments happening here in Dunedin, but research relies heavily on grants and donations."

> **Mike is asking for pledges of $2,000 per year to the Friends of the Foundation.**
>
> **Will you join us to help fund this world class research in your city, for your children and grandchildren? The target is $100,000 per year – all for research.**
>
> *For more information get in touch with OMRF Director of Development Susan Sims: email susan.sims@omrf.org.nz or call (03) 477 8977*

THE OTAGO MEDICAL RESEARCH FOUNDATION COUNCIL

EX OFFICIO MEMBERS

Prof G Jones
Chairperson of Scientific Committee

Mr J Adamson
Deloitte (Secretaries)

Prof B Taylor
Dean Dunedin School of Medicine

Prof V Ward
Dean Otago School of Biomedical Sciences

Dr H Cunliffe
Deputy Chairperson of Scientific Committee

APPOINTED MEMBERS

Dr P Gootjes
NZ Medical Association (Otago Division)

Dr N Millar
Otago District Health Board

Prof A van Rij
Otago University Faculty of Medicine

Dr S Baird
President of the Otago Medical School Research Society

ELECTED MEMBERS

Mrs J Bevin

Dr M Coleman

Mr K G Dempster

Mrs S Knowles

Mr M Milne

EXECUTIVE

Mr KG Dempster
Chairperson

Prof G Jones
Deputy Chairperson

Deloitte representative
Secretary/Treasurer

DIRECTOR OF DEVELOPMENT

Ms S Sims

EVENT MANAGER

Mr S Davie

SECRETARIES

Deloitte

HONORARY SOLICITOR

Mr J Anderson (Gallaway Cook Allan)

AUDITORS

Crowe Horwath

PATRON

Emeritus Professor Gil Barbezat

SCIENTIFIC COMMITTEE REPORT

1 July 2018 to 30 June 2019

1. MEMBERSHIP

Chair: Professor Greg Jones,

Deputy Chair: Dr Heather Cunliffe (Co-opted)

Dr Hesham Al-Sallami (Co-opted)

Dr Andrew Bahn
(Nominee Otago Medical School Research Society)

Dr Sarah Baird (President Otago Medical School Research Society, ex officio, *January 2019*)

Dr Sierra Beck
(Nominee Dunedin School of Medicine, *December 2018*)

Dr Chris Brown (Co-opted)

Dr Cathy Chapple (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)

Associate Professor Ivan Sammut (Co-opted)

Dr Damian Scarf (Co-opted)

Professor Rob Walker (Co-opted)

Dr Joanna Williams (Co-opted)

Dr Lyn Wise (President Otago Medical School Research Society, *until Dec 2018*)

Dr 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.

Over the last year the Scientific Committee has welcomed two new members, Dr Sarah Baird, who is the current President of the Otago Medical School Research Society and Dr Sierra Beck, a nominee of the Dunedin School of Medicine. Both have fitted in well and have proven to be valuable members of the Committee. Dr Lyn Wise completed her *ex officio* term (as President of the Otago Medical School Research Society, 2017-2018) and stood down from the Scientific Committee at the December 2018 meeting. Lyn was a strong and enthusiastic contributor to the committee and the Foundation thanks her for her significant contribution.

Dr Heather Cunliffe kindly agreed to accept the position of Deputy Chair of the Scientific Committee from March 2019. The term of her appointment will align with that of the current Chair.

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 following website **www.omrf.org.nz**

2. SUMMER RESEARCH SCHOLARSHIPS 2018/2019

One hundred and twenty one applications (compared with 110 the previous year) for an OMRF summer research scholarship were received from the University of Otago in late August 2018, of which 25 (cf 19 last year) were recommended for funding by the OMRF. Of the 25 students funded by the OMRF, **two were studying biomedical science, two dentistry, five medicine and ten science.** 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 $4,000 except for the two students with the highest scores who were awarded named Summer Research Scholarships ($5,000) – 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. One of the projects was funded from the Foundation's Iverach Fund, another was administered by the OMRF but sponsored by the Otago/Southland Diabetes Research Trust and one was funded by existing OMRF funds.

Due to the continuing sponsorship drive of the OMRF, the other OMRF scholarships were funded by: Ailsa Goulding, Crest Cleaning, Lions Club of Dunedin South, Walsh & Beck, Crowe Horwath (now FINDEX Community Fund), EMM Haynes Charitable Trust, Deloitte, Healthcare Otago Charitable Trust, MM & JH Hughes Family Trust, Otago Southland Diabetes Research Trust, PaperPlus Dunedin, the Kingston Sedgfield Charitable Trust, Southern Victorian Charitable Trust (2), The Southern Trust (4) Stonelake family and Werribee Trust. The involvement of Otago commercial companies and the Otago community for an eighth 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 website: **www.omrf.org.nz**

All scholars returned good to excellent reports at the end of February 2019. The Renshaw Prize ($250) for the best report was awarded this year to Eleni Hackwell, who worked under the guidance of Professor Dave Grattan of the Department of Anatomy.

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.

ELENI HACKWELL

(Supervisor: Professor Dave Grattan. Department: Anatomy – BMS)

PROJECT: The mechanism underlying lactational in fertility.

Funder: Lions Club of Dunedin South – administered by Perpetual Guardian

Renshaw Prize Winner for the best OMRF summer research scholar report

ABSTRACT: Lactation is associated with a period of infertility. However, the mechanism underlying lactational infertility is unclear. This in fertility coincides with elevated levels of a hormone called prolactin, which is important for milk production. However, high levels of prolactin are also known to cause in fertility in both men and women. We were therefore interested in testing the hypothesis that during lactation prolactin acts on cells in the brain called 'kisspeptin neurons' suppressing them and there by inhibiting fertility. Using genetically modified mice that can't respond to prolactin in these kisspeptin neurons, we were able to show that prolactin acting on these neurons is indeed crucial for maintaining infertility during lactation: mice not able to respond to prolactin started ovulating significantly earlier than control mice. This research shows a likely mechanism through which the hormone prolactin acts to keep women in fertile during lactation.

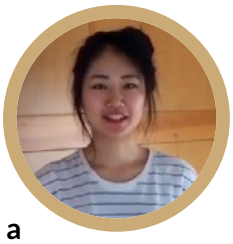
ALL PAST RENSHAW PRIZE WINNERS

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

SONYA AUM



(Supervisor: Associate Professor Barbara Galland. Department: Women's and Children's Health - DSM)

PROJECT: Managing Diabetes in a 'flash': Flash glucose monitoring in adolescents with unhealthy control of type 1 diabetes.

Funder: Otago Southland Diabetes Research Trust administered by Perpetual Guardian

ABSTRACT: Healthy glycaemic control is important for preventing and minimizing long term diabetes complications; however, the majority of adolescents fail to meet international targets. Flash glucose monitoring (FGM) is the newest technology targeting better glucose monitoring in diabetic patients. FGM provides accurate glucose information painlessly, and may reduce disease burden. This study aimed to explore barriers and facilitators in using FGM among parents of adolescents with a history of unhealthy type 1 diabetes mellitus (T1DM). Twelve parents (9 mothers, 3 fathers) were interviewed in total. The interviews were transcribed and analysed to identify major parental experiences regarding FGM use. The key findings included: emotional improvements in parents and improved parent-child relationships, but also the identification of sensor failure/malfunction challenges. Overall, commencement of FGM in adolescents with unhealthy glycaemic control has a variety of positive impacts on parents of these children. This data may be helpful for health care providers when discussing this technology with families of teenagers impacted by T1DM.

HELENE CHUA

(Supervisor: Dr Joanne Choi. Department: School of Dentistry)

PROJECT: How does the water coolant design of a dental drill affect frictional heat reduction on the tooth?

Funder: The Southern Victorian Community Trust

ABSTRACT: How does the water coolant design of a dental drill affect frictional heat reduction on the tooth? In dentistry, a high-speed hand piece (HSH) is used to "drill" teeth prior to restoration. HSHs have a water coolant system to prevent heat generation by friction, which would otherwise damage the teeth. However, there is a lack of knowledge among practitioners regarding the cooling effect of these various cooling designs, such as that of the number of water coolant ports. This study compared the cooling efficiency of 1-, 3-, and 4-coolant port designs on extracted human teeth by recording real-time temperature change. All three coolant port designs resulted in cooling of the tooth and net decreases in pulpal temperature.

CERI DELL

(Supervisor: Dr Rachael Augustine. Department: Physiology Department - BMS)

PROJECT: Novel research into O-GlcNAc protein modification indicated in diabetes.

Funder: The Southern Trust

ABSTRACT: Diabetes or glucose intolerance affects millions worldwide and leads to often debilitating complications in the future. New proteins and modifications indicated along the disease's pathway could provide future target options for treatments. My research involved one of these protein modifications named O-GlcNAc. O-GlcNAc has been shown to be elevated in the hearts of diabetic patients, and glucose intolerant pregnant mice, and maybe crucial in the disease's pathway. My research was interested in establishing the differences in O-GlcNAc between diabetic and non-diabetic mice. To do this I immunologically stained the cells containing O-GlcNAc within the mice hypothalamus, and then counted the number of cells positive for the modification in both glucose intolerant and control mouse models. No statistically significant difference between the two groups was found, however trends towards an increase in diabetic mice were observed. Further research is now being conducted looking at other regions of the hypothalamus.

PHOEBE DEWAR

(Supervisor: Dr James Ussher. Department: Microbiology and Immunology BMS)

PROJECT: Effects of bacterial viability on activation of anti-bacterial immune cells.

Funder: Otago Medical Research Foundation

ABSTRACT: Activation of Mucosal associated invariant T (MAIT) cells, a type of anti-bacterial immune cells, requires interactions with other immune cells and can be influenced by bacterial signals. There is the potential that live, infective bacteria provide additional signals to immune cells that dead bacteria do not, enabling the immune system to correctly recognise the threat of the bacteria. We investigated whether these potential signals from live bacteria influence activation of MAIT cells by combining white blood cells with bacteria that were either alive, heat-killed, formaldehyde-treated or lysed. The results indicated that live bacteria may influence secretion of molecules from cells, therefore the presence of live bacteria may be influencing MAIT cell activation.

GEORGINA FAGAN

(Supervisor: Professor Michael Shultz. Department: Medicine - DSM)

PROJECT: Changes in the composition of gut bacteria in patients with Inflammatory Bowel Disease following a personalised exercise programme.

Funder: Iverach

ABSTRACT: Inflammatory Bowel Disease (IBD) is a chronic and debilitating condition which causes inflammation in the lining of the gut, significantly affecting a patients' quality of life. It is unknown the effect that exercise has on the composition of gut bacteria in patients with IBD, therefore, the purpose of this study was to investigate this. To do so, 108 faecal samples were collected from patients with IBD who had participated in a four-month exercise intervention and were analysed using standard

analysis methods. No significant changes were seen in the composition of the gut bacteria of patients after the exercise intervention. In line with previous research, the effect that exercise has on the gut microbiota was not obvious in this study, therefore further research with more advanced techniques are recommended to fully investigate the compositional changes of gut bacteria in patients with IBD following an exercise intervention.

DUNCAN FINLAYSON

(Supervisor: Dr Tania Slatter. Department: Pathology – DSM)

PROJECT: Effects of the Tumour 'Microenvironment' and Chemotherapy on Brian Tumour Development.

Funder: MM & JH Hughes Family Trust

ABSTRACT: Glioblastomas are a type of malignant brain tumour with particularly bad prognoses for patients. Tumour protein p53 (TP53) is a gene that encodes p53 tumour suppressor proteins, that normally function to prevent cancer growth. However, abnormal p53 proteins are produced in some glioblastomas and may play a part in their progression. Here we investigated how different microenvironmental and chemotherapeutic stimuli change the levels of these abnormal p53 proteins in glioblastomas. We also investigated how the levels of these abnormal proteins differ between primary and recurrent tumours. We found that there may be a difference in the expression of these proteins in glioblastomas subjected to various cellular stressors. Also, these abnormal proteins were found in higher quantities in primary tumours compared to recurrent tumours. This study urges further investigation into how abnormal p53 proteins contribute to glioblastoma development.

MITCHELL FOSTER

(Supervisor: Associate Professor Jo Kirman. Department: Microbiology and Immunology - BSM)

PROJECT: Sorting Innate Lymphoid Cells Implicated in the Immune Response to Tuberculosis.

Funder: Werribee Trust

ABSTRACT: Mycobacterium tuberculosis causes tuberculosis (TB) in humans, a globally significant, potentially fatal disease of the lungs, for which there is currently no effective vaccine. Vaccine efforts have historically focused on producing immune responses from TB-specific immune cells, with limited success. A recently discovered group of immune cells, called innate lymphoid cells (ILCs) are activated by a wider range of signals than other, more specific cells. ILCs have also been shown to move into the lungs and become activated after TB vaccination, but it is unclear how important they are in the immune response against TB. This project made progress in development of a method to sort ILCs into different subsets without killing them, so that they may be used in experiments with TB to determine their role in the response. If their role is significant, these cells may be the target of future vaccine efforts against the disease.

OSCAR GERMAN

(Supervisor: Dr Anita Dunbier. Department: Biochemistry - BSM)

PROJECT: Role of Aspirin in Improved Breast Cancer treatment.

Funder: Stonelake Scholar

ABSTRACT: Three quarters of breast cancers diagnosed in New Zealand express the oestrogen receptor alpha and are commonly treated with anti-oestrogen therapy. These treatments are not always effective and a number of individuals are resistant to treatment. Aspirin is a leading anti-inflammatory drug which has the potential to improve the treatment efficacy through inhibition of cyclooxygenase 1 and 2 (COX1/2). This mechanism is still poorly understood and so cannot yet be applied effectively. Our research aimed to explore this mechanism via analysis of the genes expressed in tumour biopsies before and after treatment, and identify markers of improved treatment efficacy. Through analysis of these data, 178 genes were identified as differentially expressed when the before and after treatment samples were compared.

JOYCE GUO

(Supervisor: Associate Professor Lianne Parkin. Department: Preventive and Social Medicine - DSM)

PROJECT: Treatment of type 2 diabetes: are guidelines being followed?

Funder: Paper Plus Dunedin

ABSTRACT: It is recommended by current guidelines that people with type 2 diabetes take certain drugs following their initial metformin therapy if needs be. In New Zealand, there are currently limited studies on the treatment patterns of patients and whether or not these guidelines are being followed. In our study, we have used routinely collected anonymised data from the Ministry of Health over the years 2006 to 2014 to identify such treatment patterns. We found that overall, 73% of people who had treatment beyond metformin used a recommended second-line therapy whilst only 24% of those who had further treatment use a recommended third-line therapy. We conclude that the real-world type 2 diabetes treatment patterns in New Zealand are not always consistent with the guidelines.

NATALIE HYLAND

(Supervisor: Professor Murray Thomson. Department: School of Dentistry)

PROJECT: The residual dentition among New Zealanders in aged residential care.

Funder: Kingston Sedgfield Charitable Trust

ABSTRACT: This study analysed the remaining teeth among older New Zealanders living in residential aged care facilities. Using national data from the Older People's Oral Health Survey, we determined the residual dentition arrangement and Kennedy classification for each dental arch. Individuals were categorized based

on their upper-lower dental configuration. Upper tooth bounded saddles had the highest prevalence, meaning natural teeth remained adjacent to the empty spaces. Younger participants had less exposure to accumulated dental disease and favoured Kennedy class II, III and IV configurations. There were minimal sex differences for partially dentate configurations, although females were more likely to have a fully dentate arch. Great disparities were observed across ethnic groups. Māori were up to eight times as likely to have only lower anterior teeth remaining than other ethnic groups. Upper dentures were worn more than their lower counterpart. Age, sex and ethnic characteristics were associated with particular residual teeth configurations.

JESSIE KING

(Supervisor: Professor Rhonda Rosengren. Department: Pharmacology and Toxicology – BMS)

PROJECT: The potential of seaweed constituents to modulate cellular metabolic responses.

Funder: Crest Cleaning

ABSTRACT: Daily human exposure to a vast number of xenobiotics (non-naturally occurring chemical substances), whether that be through food or environmental pollution, requires an adaptive metabolic response at the cellular level. It also happens that this evolutionarily-conserved system also influences the cellular response to a variety of pathological conditions, such as inflammation, immunity and breast cancer. Given the relative ease by which dietary constituents may be able to modulate this system, the identification and characterisation of such xenobiotics is a worthwhile pursuit to find natural means of preventing or treating a range of diseases. The current study undertook such initial investigations into five seaweed-derived compounds, assessing their capacity to modulate this adaptive metabolic response. All five compounds exerted low toxicity on both human and mouse liver cells and demonstrated differential modulation of the signalling pathway of interest. Therefore, further testing of these compounds as therapies towards numerous different conditions is warranted.

GEORGIA MACKENZIE

(Supervisor: Dr Regis Lamberts. Department: Physiology - BMS)

PROJECT: Exploring the nerves regulating the diabetic heart.

Funder: The Southern Victorian community Trust

ABSTRACT: Heart disease is one of many complications that patients with diabetes may face; but the reason behind is still not well understood. One type of heart disease common in diabetics emerges from a problem in communication between the heart and brain, and the nerves connecting the two. My study looked at the nerve pattern on the heart surface in rats induced with Type 2 diabetes, using an immunohistochemical staining technique. I found that the innervation pattern of diabetic rat hearts features an increase in the number of short nerve branches. Nerves were also analysed to determine the number of axons, however results were inconclusive. My study adds knowledge about structural neuronal changes in diabetes, to compliment previous studies on functional changes in diabetes, and create more options for possible treatment target.

JAMIE MARRA

(Supervisor: Dr Abdullah Barazanchi. Department: School of Dentistry)

PROJECT: How do former refugees in Dunedin access oral health care?

Funder: EMM Haynes Charitable Trust

ABSTRACT: Former refugees face many challenges in resettlement with very few resources. They are likely to have high health needs and difficulties in accessing health services. Dunedin resettled 468 former refugees between 2016 and 2018. New Zealand increased the annual refugee quota in 2018 and committed to an additional increase by 2020. Thus, a thorough understanding of the burden on the health care system is indicated. The Faculty of Dentistry served the majority of former refugees in Dunedin at some point on their care pathways. In Dunedin, former refugees may start with their general practitioners who refer to the oral health care system or may present directly. We interviewed frontline administrative and clinical staff to identify perceived barriers to care. We also conducted a facilities review to identify relevant resources and processes. We combined the findings to characterise the pathways refugees experience in seeking oral health care.

SARAH MCQUEEN

(Supervisor: Associate Professor Fiona McDonald. Department: Physiology – BSM)

PROJECT: The regulation of the epithelial sodium channel in breast cancer cell lines by the steroid hormone aldosterone.

Funder: Walsh & Beck

ABSTRACT: In New Zealand, the leading cause of cancer-related death in women is breast cancer. In order to uncover new treatment options, it is important to understand if ion channels such as the epithelial sodium channel (ENaC) are possible regulators of cancer cell function. There is limited research investigating ENaC in breast cancer. This project aimed to investigate the effect of aldosterone: a steroid hormone and regulator of ENaC, on the protein level of ENaC in breast cancer cells. Two breast cancer cell lines were used and these were incubated with aldosterone or a vehicle control for varying amounts of time. Western blotting was used to visualise the amount of ENaC present following each condition. There was no significant reduction or increase in ENaC found at any time point but after 30 minutes there was a trend towards a reduction in ENaC present on the breast cancer cell.

RAQUEL PARACKAL

(Supervisor: Dr Jeff Erickson. Department: Physiology - BMS)

PROJECT: Nitric Oxide and CaMKII; A New Target for Treating Heart Disease?

Funder: Crowe Horwath (now FINDEX Community Fund)

ABSTRACT: In cardiovascular disease (CVD) the adrenaline stress response is upregulated, calcium/calmodulin dependent kinase II (CaMKII) is over activated and causes lethal heart rhythms. The prescription of β-blockers to manage this effect is controversial due to the adverse side effects; thus, it is imperative for alternatives to be developed. CaMKII can be activated and inhibited by nitric oxide (NO), so this study assessed NO inhibition of CaMKII as a novel alternative drug target. Mice were genetically engineered to have CaMKII that could not be inhibited by NO and therefore had overactive CaMKII. Heart ultrasounds were done to assess heart function. In young mice, heart function was significantly enhanced. With age, heart function deteriorated to a diseased state and the development of abnormal heart rhythm increased. I concluded that NO inhibition of CaMKII may be dysregulated in CVD and could be a potential new drug target.

JACQUI PERKINSON

(Supervisor: Associate Professor Mik Black. Department: Biochemistry - BMS)

PROJECT: Investigating the genetic influences in the development of stomach cancer.

Funder: Deloitte

ABSTRACT: Stomach cancer is a common worldwide cancer, responsible for 720,000 annual deaths. The E-cadherin gene (CDH1), acts to stick neighbouring cells together, and when inactive is implicated in a type of stomach cancer called diffuse gastric cancer (DGC). Thus, identification of genes functioning in conjugation with CDH1 provides a potential drug target strategy, allowing treatment of DGC that lacksCDH1 activity. Targeting inactivated CDH1 is challenging as it is no longer expressed in cells. Therefore, targeting certain genes may provide a mechanism to kill CDH1-deficient cancer cells while non-cancer cells are unharmed.

MICHAEL PERKINSON

(Supervisor: Professor Colin Brown. Department: Physiology - BMS)

PROJECT: Brian Regulation of Oxytocin Neurons for Birth.

Funder: The Southern Trust

ABSTRACT: The hormone, oxytocin, triggers uterine contractions, which are required for the delivery of a baby. Oxytocin is released directly into the blood stream from cells in the brain. In non-pregnant animals, oxytocin secretion is low but increases during pregnancy in preparation for birth. Currently, the changes within the brain that increase oxytocin secretion for birth are unknown. Here, I used in-vivo recording from oxytocin cells to show that the neuropeptide, alpha-melanocyte-stimulating hormone, inhibits oxytocin cells in non-pregnant rats but excites oxytocin cells in late-pregnant rats. Hence, alpha-melanocyte-stimulating hormone might contribute to oxytocin release required for birth.

SARAH ROBINSON

(Supervisor: Professor Kurt Krause. Department: Biochemistry - BMS)

PROJECT: Targeting glutamate racemase to aid the discovery of new tuberculosis treatments.

Funder: McQueen

ABSTRACT: Mycobacterium tuberculosis is causal in tuberculosis, and the emergence of multidrug-resistant strains highlights the need for improved therapeutics. Glutamate racemase (GR) is an enzyme essential for mycobacterial growth, making it an attractive target for development of new inhibitors. Testing the ability of drug candidates to bind and inhibit GR requires a purified and active model. Unfortunately, GR shows reduced stability and activity outside the cell, and it has proven difficult to measure its natural activity. This project aimed to use an existing assay to confirm its reliability as a measure of enzyme activity. GR from M. smegmatis, a non-pathogenic cousin of Tuberculosis, and Bacillus anthracis, an unrelated enzyme with significant activity were used, and the results of the project confirmed enzyme characteristics generated by previous investigations pertaining to the rate of activity of the enzymes.

JOSH SCADDEN

(Supervisor: Professor Iain Lamont. Department: Biochemistry - BMS)

PROJECT: How does a superbug become resistant to antibiotics?

Funder: Wilkinson

ABSTRACT: Pseudomonas aeruginosa is a highly antibiotic resistant bacterium and is a leading cause of hospital related infections. Many of the mechanisms through which P. aeruginosa gains resistance are poorly understood. The aim of this project was to determine how P. aeruginosa develops resistance to two commonly used antibiotics, meropenem and ceftazidime. This was undertaken by screening a constructed library of the bacterium Escherichia coli containing random mutations in P. aeruginosa AmpC (a gene encoding an enzyme that degrades β-lactam antibiotics) to identify genetic variations which may cause antibiotic resistance. The screening results did not identify any genetic variations in AmpC, indicating that E. coli resistance to these two antibiotics occurs through different mechanisms. These results open the possibility for further research into how P. aeruginosa develops resistance to meropenem and ceftazidime.

HANNAH SCOBIE

(Supervisor: Professor Cliff Abraham. Department: Psychology)

PROJECT: Effects of a Neuroprotective Protein on Expression of a Neuronal Signalling Protein.

Funder: Health Care Otago Charitable Trust

ABSTRACT: Neurodegenerative Alzheimer's Disease (AD) displaying memory and thought impairment is associated with low levels of secreted amyloid precursor protein (sAPPα) in the brain. Research in the past has shown sAPPα to protect from and reverse the undesirable effects of AD in mouse trials. The beneficial properties of sAPPα suggest it has potential to be used as a therapeutic treatment for patients suffering from AD and other types of neurodegenerative conditions. The following experiment aimed to investigate the underlying mechanism by which sAPPα works to improve and protect brain function through treatment of cells from rat brains. Results from this experiment found no significant effect of sAPPα however, when combined with wider evidence from other research, sAPPα related therapeutics still appear to have potential benefits and should be further investigated.

RYAN VORSTER

(Supervisor: Dr Xochitl Morgan. Department: Microbiology and Immunology - BMS)

PROJECT: Screening poultry for vancomycin-resistant enterococci (VRE).

Funder: The Southern Trust

ABSTRACT: Vancomycin-resistant enterococci (VRE) are alarming bacteria which kill approximately 1,300 people every year in the United States and infected 67 people in New Zealand in 2017. Between 2000 and 2004, Janet Manson and colleagues demonstrated that VRE was commonly isolated from NZ boiler farms due to the use of multiple antibiotics in the poultry industry. One group of Enterococcus faecalis was particularly common among poultry and causes human infections. It has also persisted in the environment as recently as 2014 (Rushton Green). We performed this follow-up study to determine the prevalence of VRE in commercially available poultry products to show whether supermarket poultry is a potential reservoir of VRE. We were able to isolate vancomycin-resistant bacteria from chickens, but not VRE.

REBECCA WEIMING YI

(Supervisor: Dr Peter Li Mei. Department: School of Dentistry)

PROJECT: Along-term retrospective study of the curve of Spee in orthodontic patients.

Funder: Otago Medical Research Foundation

ABSTRACT: The curve of Spee (COS) is a naturally occurring curve in the human dentition. It is commonly levelled as a part of routine orthodontic treatment, but the stability of such a movement is unclear. This project investigated the long-term stability of levelling the COS, and the related factors influencing relapse. Patients who had fixed appliances debonded 4-11 years ago were recalled to complete a questionnaire and digital impressions were taken with TRIOS 3Shape. One hundred percent of participants experienced relapse in their COS, assuming COS immediately post-treatment was zero. Multiple regression also discovered that self-perceived adherence to retention protocols, overbite and over jet explained 57% of the variability in the COS, with over jet as a statistically significant factor in predicting the average COS (p=0.003). Thus, it is of clinical relevance for clinicians to be able to use a patient's easily measurable overjet and overbite to predict any concurrent potential relapse in COS.

BRANDON WRIGHT

(Supervisor: Dr Sarah Diermeier. Department: Biochemistry BMS)

PROJECT: Characterization of a potential new drug target in colorectal cancer.

Funder: Dr Ailsa Goulding

ABSTRACT: Colorectal cancer is the second highest cause of cancer related deaths in New Zealand. One of the most lethal aspects of the disease is its spread from the colon or rectum to distant organs such as the liver, lungs or brains. No currently available medicines are designed to specifically target the spread of colorectal cancer. This research aimed to characterize a potential new target for colorectal cancer medicines, named hMaTAR17. While cells with reduced hMaTAR17 were identified as part of this study, subsequent experiments examining the effect of this target on cell proliferation and survival were inconclusive, suggesting that further experiments need to be performed to make a clear conclusion.

WANYING ZHANG

(Supervisor: Dr Jim Faed. Department: Pathology – DSM)

PROJECT: New test methods for identifying harmful ABO blood group antibodies.

Funder: The Southern Trust

ABSTRACT: Some antibodies cause rapid in vivo destruction of red blood cells (RBCs) -called haemolysis. This study evaluated variables affecting a new method for detecting antibodies that cause haemolysis. The method used a high salt (chaotropic) technique to detect antibodies that bind with high affinity. Samples from 174 Blood Service donors were tested, comprising 87 potentially haemolytic donor samples in Blood Service tests and 87 that were not haemolytic. Red cell agglutination (aggregation) scores were assessed. A testing technique which produced the best discrimination between potentially haemolytic (92% reactive) and non-haemolytic (2% reactive) antibodies was identified. Further studies indicated that the Blood Service test method may be improved by using this technique. The new method requires plastic tubes coated with albumin to prevent red cells sticking to the plastic.

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 2018 there were 20 applications from the University of Otago (cf 25 the previous year) totalling $582,657 and eight of these were funded at a total expenditure of $179,213 of which $70,000 was provided most generously by the Otago Community Trust. These grants commenced between August and October 2018 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 2019. The funded projects are summarised below:

(I) ANNUAL GRANTS

Professor Iain Lamont & **Dr Kay Ramsay**
(Department of Biochemistry)

The effect of sub-lethal concentrations of antibiotics on Pseudomonas aeruginosa – AG 374

Sponsored by OceanaGold

The bacterium Pseudomonas aeruginosa causes severe respiratory infection for individuals with cystic fibrosis (CF). Regular and prolonged antibiotic treatment is required to maintain patients' health. P. aeruginosa are therefore continually exposed to sub-lethal amounts of antibiotics. Limited studies have shown that an increase in antibiotic resistance of P. aeruginosa can occur under these conditions, but have not examined bacteria from CF individuals or investigated the mechanisms of resistance. By exposing clinical and laboratory strains to sub-lethal concentrations of clinically relevant antibiotics over an extended period we will determine how this treatment may impact the antimicrobial resistance profile of P. aeruginosa, with implications for improved antibiotic treatment management of this disease.

Dr Shyamal Das (School of Pharmacy), **Associate Prof Rajesh Katare** (Department of Physiology), **Professor Phillip Hill** (Department of Preventive and Social Medicine), **Dr Jack Dummer** (Department of Medicine)

Evaluation of safety and pharmacokinetics of inhaled rifampicin in rats – AG 376

Sponsored by Southern Victorian Charitable Trust

Tuberculosis (TB) is an infectious disease primarily localized in the lung although it can affect other organs. Current oral and parenteral treatment using high doses of multiple drugs is ineffective since only a small fraction of drug goes to the lung. Potentially more effective treatment can be achieved by pulmonary delivery of anti-TB drugs ensuring high levels of drugs in both lungs and blood. This is a pre-clinical study of inhaled rifampicin (a first line anti-TB drug) powder, administered to rats to evaluate its safety and pharmacokinetics. This will enable design of clinical studies on inhaled rifampicin and other anti-TB drugs.

Dr Lyn Wise & **Professor Michelle Glass**
(Department of Pharmacology and Toxicology)

Project Refining vascular networks through biased receptor tyrosine kinase signaling – AG 375

Sponsored by the JN Lemon Charitable Trust

Tyrosine kinase receptors are critical to the development and regeneration of any tissue in our body. Abnormal expression of these receptors has been linked to a diverse range of disorders from growth and healing defects, to pathological inflammation and cancer. This research aims to discover the mechanism behind signalling bias in these receptors. This will be the first step towards development of drugs that refine vascular networks, with the ramifications extending from the engineering of vascularised bone or skin, to therapeutic angiogenesis for ischaemic tissues, to the normalisation of retinal or tumour vasculature.

Dr Luke Wilson (Department of Medicine), **Professor Dirk de Ridder** & **Dr Sook Ling Leong**
(Department of Surgical Sciences)

Closed-loop neurofeedback on the cardiac autonomic nervous system, a pilot study – AG 377

Sponsored by Mike Bird and Friends of the Foundation

Alterations in the nervous control of the cardiovascular system is an independent risk factor for cardiovascular disease and is difficult to treat. We will use a brain training technique known as Infraslow neurofeedback for two key areas of the brain that are known to positively impact the nervous control of the cardiovascular system in healthy individuals. If the findings of the infraslow neurofeedback training are positive we will attempt this form of training in patients with known alterations in the nervous control of the cardiovascular system.

(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:

Dr Kiel Hards & **Professor Greg Cook** (Department of Microbiology and Immunology)

How do proton-motive forces correlate with antimicrobial efficacy? - CT 379

Antimicrobials were once the "one-size fits all" approach to varied societal problems; such as controlling infections in human, animals and plants, or their extensive use as growth promoters in food animals. However, microorganisms appear to be winning the drug arms race and, without more dedicated research, they threaten to return society to a pre-antibiotic era. It's known that all organisms produce a kind of biological electricity, usually a proton motive force (PMF), when they respire. Recently, it was found that short-circuiting this electricity is an incredibly effective property in antimicrobials. Our research proposes to investigate how new drugs affect the PMF in various human pathogens, focusing on the Tuberculosis bacterium.

Dr Nicholas Fleming (Department of Pathology), **Dr Peter Shepherd** (Auckland University), **Prof John McCall** (Department of Surgical Sciences)

A new biomarker for colorectal cancer prognosis and targeted therapy in southern New Zealand. - CT 378

Otago, Southland and South Canterbury have the highest rates of death due to bowel cancer in New Zealand, being approximately 25% higher than the national average. We have analysed 192 patients from these districts and identified a common and easily testable genetic feature that indicates who will get earlier and faster progressing bowel cancers. The feature has immediate value for predicting the course of the disease in southern New Zealand, but may have greater value for indicating which therapies are most likely to work. We will investigate the effects of the feature in the bowel, and also test whether it defines cancer response to a new and relevant drug. The feature may guide the successful use of this drug for bowel cancer patients in southern New Zealand.

(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 2018 there were 12 applications (compared with 17 the previous year) from the University of Otago totalling $396,605 and three of these were funded at a total expenditure of $79,941. All grants commenced on 1 February or 1 March 2019 and Abstracts from the final report will be available on the OMRF website mid-2020. The funded projects are summarised below:

Dr Andrew Reynolds & **Professor Jim Mann** (Department of Medicine)

Wholegrain structure and control of type 2 diabetes: randomised crossover trial - LA 384

Nutrition is a cornerstone of approaches aimed at reducing the risk of several important chronic diseases. Wholegrain foods are of particular benefit in preventing and treating type 2 diabetes and cardiovascular diseases. However, the definition of whole grains does not specify the extent to which the grain may be processed, with many currently available wholegrain foods highly refined. We have shown that the degree of processing can influence blood glucose levels after meals. We now propose to carry out a longer term randomised crossover trial which will determine whether wholegrain foods can improve overall diabetes control and some risk factors for heart disease.

Prof Paul Glue & **Dr Shabah Shadli** (Department of Psychological Medicine), **Prof Neil McNaughton** (Department of Psychology)

Ketamine therapy for 'neurotic' disorders: is there a single mechanism - LA 385

Neurotic disorders (anxiety and depression), are the most prevalent mental disorders in New Zealand, USA and Europe. Neurotic disorders have high chronicity, are highly disabling, have severe impact on societies, with suicidal ideation, suicide attempts and costs to public health. But, currently available medications are ineffective in almost 35 to 40% anxious/depressed patients; making them treatment resistant. Hope is raised by ketamine. We have found ketamine to have therapeutic effects in Generalized Anxiety Disorder and Social Anxiety Disorder cases, where other treatments were ineffective. These effects correlated with decreased theta frequency rhythms in frontal brain activity. This new study will test if ketamine produces similar therapeutic changes in all neurotic disorders.

Dr Gregory Giles, Prof Rhonda Rosengren, Dr Carol Bussey, Dr Niroshini Giles (Department of Pharmacology & Toxicology)

Targeted Nitric Oxide Donor Drugs to Cure Breast Cancer - LA 386

Photodynamic therapy is a technique that uses light to activate a drug inside a tumour; the activated drug then proceeds to destroy the tumour from within. As the applied light can be selectively focused on the cancer, the drug only activates within the tumour environment. This causes localised anti-cancer action, whilst avoiding side effects in other areas of the body. We have recently developed a new lead compound for photodynamic therapy, tDodSNO, which has promising activity against cancer cells. We now propose to evaluate tDodSNO in animal and cell culture models of breast cancer, a disease which urgently needs new treatments as patients have a very poor prognosis.

(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 2018 there were three applications (compared with four in the previous year) from the University of Otago totalling $87,132 and three of these were funded at a total expenditure of $$79,132. All grants commenced on 1 February or 1 March 2019 and final reports are due at the end of April or May 2020. Abstracts from the final report will be available on the OMRF website. The funded projects are summarised below:

Dr Cathy Chapple, Ms Miranda Buhler & **Professor David Baxter** (School of Physiotherapy), **Associate Professor Simon Stebbings** (Department of Medicine)

Management of thumb osteoarthritis feasibility study - JT 381

Thumb base Osteoarthritis involves the small mobile joint at the base of the thumb. It is a common condition, especially in older adults, that causes pain, interferes with grip and precision tasks, and restricts people's ability to carry out paid work, caregiving, and activities of independence. Splinting is an important treatment option that does not rely on medication or surgery, neither of which have proven to be particularly beneficial or preferred by patients. However, only weak evidence supports the use of splints; international guidelines have highlighted Thumb base Osteoarthritis as in need of more research. The proposed study will establish the feasibility of a future large-scale trial comparing splint treatment to usual care.

Dr Ross Wilson & **Professor Haxby Abbott** (Department of Surgical Sciences), **Dr Rick Audas** (Department of Women's and Children's Health)

Chronic opioid use following joint replacement surgery: a cross-national comparative study - JT 382

We will investigate the use of opioid painkillers after joint replacement surgery to identify patients at high risk of long-term opioid use. We will describe the use of opioids in the years before and after the patients' surgeries, using population-wide data from the New Zealand public healthcare system, and compare these findings with similar studies being undertaken in Australia and Canada. We will also identify the risk factors which are linked with long-term opioid use after surgery. This work will inform the optimal prescription of pain management for surgery patients, to obtain effective pain relief while minimising the risks of harm associated with long-term opioid use.

Dr Paul Hessian (Department of Medicine)

Insight into pathogenic mechanisms causing extra-articular complications in rheumatoid arthritis - JT 383

Rheumatoid arthritis is a chronic inflammatory disease associated with painful and swollen joints, often causing joint deformity. Rheumatoid inflammation also involves sites away from joint tissues, including development of rheumatoid nodule lesions in the skin. Methotrexate is a drug recommended as part of treatment for reducing rheumatoid disease activity. Ironically, nodules can develop with methotrexate therapy, even though joint inflammation improves. This proposal investigates this phenomenon, focusing on genes within nodules, apparently affected by methotrexate therapy. Where these genes are expressed, and the cells involved, we anticipate will explain how this drug promotes inflammation at one site while having an anti-inflammatory effect at others.

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 2018** scientific meeting of the Otago Medical School Research Society (OMSRS) there were 10 **doctoral** candidates (selected from 15 applicants based on their submitted abstracts). The first Prize ($1,000) funded by Otago Postgraduate Medical Society was awarded to **Brin Ryder** (supervisor Dr Jo Kirman, Department of Microbiology and Immunology) on the topic of ""Immunisation with BCG alters lung phagocyte dynamics during early mycobacterial infection of mice." The second prize ($500), which was funded by the OMRF, was awarded to **Serada Ketharnathan** (supervisor Associate Professor Julia Horsfield, Department of Pathology) on the topic of "A non-coding genetic variant maximally associated with serum urate levels is functionally linked to HNF4A-dependent PDZK1 expression".

(2) At the **May 2019** scientific meeting of the OMSRS there were 10 candidates selected to give oral presentations of their projects. All were **summer research scholars** and 5 of the 10 had been sponsored by the OMRF. The OSMRS judges were unable to differentiate between two speakers for second place, and decided to supplement the funds and award a joint second prize award. The winners were: **first prize** ($500) funded by the OMRF was awarded to **Oscar German** (supervised by JA Hazlett, K Powell, and AK Dunbier, Department of Biochemistry) on the topic of "Investigation of the mechanism of aspirin action in combined breast cancer therapy". **Joint second prizes** ($250 each) funded by the OMRF and the OMSRS were awarded to **Eleni Hackwell** (supervised by SR Ladyman, RSE Brown, DR Grattan, Centre for Neuroendocrinology and Department of Anatomy) on the topic of "Prolactin action on kisspeptin neurons is required for maintaining lactational infertility" and **Helene Chua** (supervised by J Choi, JN Waddell, Sir John Walsh Research Institute, Faculty of Dentistry) on the topic of "The cooling efficiency of different dental high-speed handpiece coolant port designs". All three winners were OMRF sponsored summer scholars.

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 Associate 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 August 2019 recipients were "Miracle Mass" by Ryan Williams, Rosebank Primary School (Year 8), "Dissolution Rates of Pain Relievers" by Hope Burke, Taieri College (Year 8), "Quick as a flash" by Oliver Lodge and Angus Bell, Kavanagh College (Year 8), "Getting Girls Active – step 1"by Aya Oseki and Daisy Jarvie, Kavanagh College (Year 8). *The Foundation's judges were Drs Heather Cunliffe, Sarah Baird, Nick Heng and Andrew Bahn*

ACKNOWLEDGEMENTS

The Foundation continues to play an ever-increasing role in funding Medical Research in Otago – I wish to thank the members of the Scientific Committee for their dedicated efforts in carefully assessing the scholarship and merit 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, 8 August 2019

EVENTS

A Night to Remember 2019

The Otago Medical Research Foundation's seventh annual black-tie fundraising dinner, hosted in the Dunedin Town Hall in mid-February, was an outstanding success.

A record $121,000 was raised to support our work in launching catalyst research projects and summer scholarships, that funding beginning just over 50 years ago in 1968.

It was a terrific night and our grateful thanks go to our sponsors, those who donated items to the auction and raffle, the successful bidders in the auction, those who bought raffle tickets and all who attended.

The 450-strong crowd listened in awe as Professor Parry Guilford outlined the advances in medical discovery in recent years and were surprised as the Minstrel effortlessly reeled off 177 New Zealand place names in a tribute to this country's geography.

They were then were amazed by headline act 'unusualist' Raymond Crowe and his mix of ventriloquism, magic, illusion and finger puppetry. Raymond was with us at the first annual dinner in 2013 and was back by popular demand. Add in the stellar performance of auctioneer Rob Fowler and a two-hour finale with DJ Matty T, and it's fair to say *A Night to Remember* was once again just that.

Dunedin Venues and Compass Catering added to the genuine quality of the event, one which is now viewed as the best of its type in the city each year.

The night's sponsors were: *Select Recruitment (Naming Rights), OceanaGold NZ, Vero Liability, Southern Trust (all Associate) and Forsyth Barr, Misha's Vineyard, Metro Realty (Sharon Hyndman & Kees Meeuws), Liquorland Leith Street & Andersons Bay, Anderson Lloyd and Nova (all Supporting Partners).*

Auction items were donated by: *Michelle Chalklin-Sinclair (The Artist's Room), Misha's Vineyard, Hannagan & Grieve Travel Associates and Bacchus Wine Bar & Restaurant, Bunnings Warehouse, Felton Road, Bayleys Dunedin, Bruce Hodgson, Fleurs Place, Boys Trip and 13 Central Otago vineyards.*

Our raffle donors were: *Mt Difficulty, Nova, Macs Brew Bar, Jizo, Highlands Motorsport Park, Erban Spa, Experience Dunedin, Luna, Klone Hair, Armstrong Prestige, Estelle Flowers and Scenic Suites Queenstown.*

2018 Foundation Golf Tournament

For the ninth straight year, the Foundation's golf tournament – staged again in association with OceanaGold – out-manoeuvred the weather gods with the first three hours of the 2018 event played in near-perfect conditions on the St Clair course.

While the wind blew for the last hour, the rain stayed away until everyone was safely in the clubhouse. A chilling southerly blast then descended upon Dunedin with heavy rain and strong winds for much of the next 12 hours. We were lucky!

A field of 25 teams contested the tournament with this year's event played under Shamble rules, leaving players more responsible for their own form than in a normal ambrose competition. There was certainly additional spice added on the putting greens and those who bought Mulligan's replays added great value to their foursome.

Dr Alan Wright's team adapted the best of those on-course, winning by more than half a point from the second-placed Palmers Mechanical team. The OceanaGold NZ # 1 side was a further point back in third spot.

More than $21,000 was raised on the day, this to be directed towards a research project to be launched under the OceanaGold name.

Funds raised at the tournament have been directed towards a study into tuberculosis to be established by Dr. Htin Lin Aung and Thomas Devine from the University of Otago's Department of Microbiology & Immunology.

Tuberculosis (TB) is the leading cause of infectious disease death in the world. Despite New Zealand being a low TB burden country, the disease has a disproportionately higher incidence in Maori (six times higher) when compared to New Zealand Europeans and the causes for this disparity remain unknown. TB is a prime example of a "social disease" with the risk factors including a complex combination of human factors (obesity, diabetes, smoking and alcohol use), socio-economic factors (over-crowding, poverty and unemployment) and bacterial factors (strain and transmissibility). In addition, a New Zealand-unique form known as the Rangipo strain is highly prevalent in Maori. The investigators will look to unravel the genetics of the Rangipo strain to discover its transmission characteristics compared to other strains in the Maori population.

It was a great day out and it's now full steam ahead to the 10th anniversary of the inaugural event in 2010.

As well as the tournament's naming rights' sponsor OceanaGold, our hole sponsors played a significant role in the success of the day and the Foundation acknowledges the support and enthusiasm of the Tarn Group, Unichem Mornington Pharmacy, RPB Law, Mr Patrick Dawes (Marinoto Clinic), Dr Alan Wright (Marinoto Clinic), Deloitte, Palmers Mechanical, Southern Colour Print, Craigs Investment Partners, McDonald's Dunedin, Forsyth Barr, Polson Higgs, RD Petroleum, Myers Marketing, Vault 21, Fulton Hogan, ANZ Private Banking and McMahon Medical.

There were also a number of team entries whose support is also appreciated: Ken & Liz Dempster (Ken is chair of the Foundation's Council), Dave Sharp's WhatsoEver team, Dean Delaney (Select Recruitment), Neil Lyons (Signature Property), Mike Bird (Friends of the Foundation), Heath Johnson (Abbott Insurance), Grant Sime and his additional Fulton Hogan team, and a very fine collection of gentlemen representing the Foundation.

Our genuine thanks too to our prize and refreshment sponsors and others who played a major part in the success of the day: Calder Stewart Industries, Dr Brian McMahon, Dr Jenny McMahon, Maher Shoes, Patrick Moore (the pro at St Clair), Aravin Central Otago, Gardens New World, the Dunedin Casino, John Griffin at Jack's Point, Mitchell's Tavern, helloworld Dunedin, Armstrong Prestige, the Brothers Hotel, Rockburn Vineyard, Farmers, Misha's Vineyard and McDonald's Dunedin.

THE RESULTS WERE:

- **Closest to the pin**: 4th - Kris Ellis; 7th - Adam Gain; 13th - Peter Young; 16th - Adrian Cross.
- **Closest to the pin (2nd shot on the 11th)**: Connor Ross.
- **Long putt winners:** Chris Timms, Mark Harper, Hayden Preston, Tony Williamson.

TEAM RESULTS:

- **1st:** playing off a handicap of 8.75 and finishing with a nett score of 54.25 – Dr Alan Wright's team
- **2nd:** 5.9, 54.875 – Palmers Mechanical
- **3rd:** 9, 56 – OceanaGold NZ # 1
- **4th:** 7.625, 56.375 – Otago Medical Research Foundation
- **5th:** 1.875, 57.125 – RD Petroleum
- **6th:** 9.5, 57.5 – Heath Johnson
- **7th:** 4.25, 57.75 – Myers Marketing
- **8th:** 11.375, 58.625 – Fulton Hogan # 2
- **9th:** 5.25, 58.75 – Whatsoever Ltd
- **10th:** 6.5, 59.5 – Forsyth Barr
- **11th:** 6.5, 59.5 – Craigs Investment Partners
- **12th:** 6.375, 59.625 – Mornington Pharmacy/RPB Law

OMRF CLUB OTAGO LUNCH SERIES

Enthusiasm for the Club Otago lunch series continues unabated with membership numbers growing after each lunch.

Since the first lunch in April 2012, almost $650,000 has been generated through members' annual subscriptions as corporate and individual supporters alike utilise the functions to host clients, guests, family and friends.

Our speakers during the 2018-2019 year were:

Former All Black captain Buck Shelford on the eve of the New Zealand vs France international at the Forsyth Barr Stadium. Along with discussing his career – highlights and those memories less palatable – Shelford opened up about his own health issues (he is in remission, having fought non-Hodgkin lymphoma) and his concerns for the current state of the game.

Wildlife cameraman extraordinaire Max Quinn, whose pictorial presentation of just a small number of the places he had visited around the globe leaving the audience spellbound and just a little jealous. Max completely understated his adventures and even though he is now officially retired, he continues to travel extensively for Natural History New Zealand.

Lesley Elliott, founder of the Sophie Elliott Foundation, hers being a speech and Q & A both courageous and inspiring. It's just over a decade now since Sophie's death. Lesley outlined the work of the Foundation named for her daughter and the progress with the Loves-Me-Not programme which is designed to prevent abusive behaviour in relationships and is aimed at Year 12 students, 16 and 17 viewed as the appropriate age to discuss relationship abuse and to start to take action for change.

Otago cricketing legend Warren Lees, who told the humbling story of a young man with a chip on his shoulder reaching the pinnacle of his sport. Warren's often hilarious insight into the make-up and mind-set of the New Zealand sides of his time as both a player and coach was an eye-opener, as was the personal battles he faced in scaling the heights he did.

It is with great sadness that we report the passing of one of Club Otago's most dedicated supporters during the year. Stu Stevenson, a kind and generous contributor to the Foundation, died in late-May 2018 having battled Motor Neuron Disease with resilience and dignity since his diagnosis in October 2015. Even to the end he was more concerned about others than he was about himself. Stu was a Fellow member of Club Otago, a regular at the annual A Night to Remember dinners and was genuinely interested in the research undertaken through the money raised at those and other events he attended. Stu could light up a room with his smile, his popularity never more evident than at his funeral where more than 700 paid their respects.

We also acknowledge the passing of Russell Quin, who was a loyal and enthusiastic individual Club Otago member for several years. Russell died in December 2018.

JOIN US

To join Club Otago, simply go to our website **omrf.org.nz/club-otago/** and fill out the form or contact Susan Sims at **susan.sims@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.

Our members in the 2018/2019 year were:

PATRONS

SENIOR FELLOW

Otago Polytechnic

Breathe Financial

FELLOW

Ross & Bev Middlemass

Allied Press

Deloitte

McMahon Investments

Carpet Court Dunedin

RD Petroleum

Stu Stevenson

ASSOCIATE FELLOW

Forsyth Barr

SF Waller Family Trust

Living Corporation

Brian Stevenson

Markhams Otago

Seperex Nutritionals

Harvie Green Wyatt

Bayleys Dunedin

INDIVIDUAL

Trevor Millar *(Cowell's Pavlovas)*

Mary Arnesen

Shirley Laney & Monica Urquhart

Janine Young

Wyn & Dorothy Chirnside *(Werribee Trust)*

Rod McMeeken *(The Brothers Hotel)*

Shelagh Murray *(Alumni Relations, University of Otago)*

Michael Milne *(Craigs Investment Partners)*

Barbara Bridger *(Otago Community Trust)*

Octagon Dental Suite *(Yash Khan)*

Otago Orthodontics *(Emily Lam)*

Nigel Thrush *(Specsavers Dunedin)*

Russell Cassidy *(Staley Cardoza Lawyers)*

Hudson Biggs *(Accounting & Finance Ltd)*

Adam Binns *(Adam Binns Commercial)*

Donna Gale *(NZI)*

Malcom Farry *(Farry Group)*

Tom West *(Tom West Risk Advisers)*

Mark Hammer *(ASB Commercial)*

Murray Hughes *(Aotea Electric)*

Adam La Hood *(Cook Brothers Construction)*

Dave McPhedran *(YBT: Accounting)*

Andrew Carmody *(helloworld Travel Dunedin)*

Dave Callon *(Share)*

Dr Kay Bradford

Steve & Tricia Gillies *(Gillies Financial)*

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

Adam Gain *(Metro Realty)*

Stuart McLauchlan *(GS McLauchlan & Co)*

Carl Spruyt *(YBT: Coaching & Consulting)*

Simon Parker *(Parker Warburton Team Architecture)*

John White *(Telfer Electrical Otago)*

Noel Davie *(Strategic Pay)*

Jono Bredin *(PKF Bredin McCormack Rewcastle)*

Rebecca Adlam *(Otago Racing Club)*

Brenda Allum *(Sports Medicine New Zealand)*

Ross Gamble *(Roslyn Storage)*

Margot Koele *(Webb Farry Lawyers)*

Dr Rod Keillor *(Marinoto Clinic)*

Malcolm Dore *(Magoo Auto Dunedin)*

Sharon Hyndman *(Metro Realty)*

Sherman Weatherall *(Agility Logistics)*

Justin & Eterei Stonelake *(Stonelake Foundation)*

Russell Quin *(Quintessentially Financial Services)*

Mr Will McMillan *(McMillan Medical Specialists)*

Prof Michael Schultz *(Gastroenterology Otago)*

Peter & Paula Anstey

Richard Roberts *(Dunedin Airport)*

John Freeland *(AON, Mosgiel)*

Mike Bird *(Storesafe Ltd)*

Bill Haydon *(Roman Catholic Diocese of Dunedin)*

Craig McGregor *(39 Per Cent Ltd)*

Jenepher Glover *(NZ RSA Trust)*

Duncan & Carolyn Northover *(Strictly Coffee Co)*

Keith Cooper & Iain Mackay *(Miller Creative Group)*

Ron Anderson *(Arrow International)*

David Miller *(Miller & Co Contracting)*

John & Jacqui Brenssell *(Paper Plus Dunedin)*

Maggie Burgess *(Polson Higgs)*

Dr Paul Templer *(Sandman Anaesthesia Services)*

Signature Property *(Neil & Jamie Lyons)*

Trevor Hastie *(International Freight Logistics)*

Sergio Salis *(London Street Specialists)*

Lynn King *(Crombie Lockwood)*

Judy Bevin *(J Bevin Ltd)*

Sarah Ramsay *(Immersion Ventures)*

Andy Campbell *(Knox & Anderson)*

Ant & Chris Wither *(Awhirk Farms)*

Dr Norman & Mrs Barbara Fitzgerald

Grant Chirnside *(Southern Realty)*

Alan & Denise Preston *(Bedpost Dunedin)*

Ray Grubb *(Morgan GR Tourism Management)*

Steve Cogger *(Black Rock Consulting)*

Garry Clarke *(Arbi Monograms)*

FINANCIAL HIGHLIGHTS

Otago Medical Research Foundation Inc.

Financial Highlights

Otago Medical Research Foundation Inc.

This summary financial report has been authorised for issue by the Chairperson of the Council Mr Ken Dempster . The results presented in the summary financial report have been extracted from the full financial report for the year ended 31 March 2019. 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 2019 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 2019

	2019 $	2018 $
Operating Income		
Donations, Bequests, Subscriptions	634,785	721,468
Investment Income	260,621	260,797
Gain on Disposal of Investments	158,318	-
	1,053,724	982,265
Less Expenses		
Administration	107,332	110,686
Promotion Costs	342,387	348,824
Loss on Disposal of Investments	-	2,282
Total Expenses	449,719	461,792
Net Surplus before Research Grants	604,005	520,473
Research Grants - Current year	407,782	361,271
Net Surplus for the year	196,223	159,202

Statement of Financial Position

As at 31 March 2019

	Market Value	2019 $	2018 $
Current Assets		322,938	428,686
Investments	6,312,546	5,331,126	5,031,366
Total Assets		5,654,064	5,460,052
Current Liabilities		358,654	360,865
Total Liabilities		358,654	360,865
NET ASSETS (EQUITY)		5,295,410	5,099,187

Statement of Cash Flows

For the Year ended 31 March 2019

	2019 $	2018 $
Net Cash Flows from Operating Activities	(19,788)	116,120
Net Cash Flows from Investing Activities	(142,757)	186,870
Net Increase / (Decrease) in Cash Held	**(162,545)**	**302,990**
Cash at the Beginning of the Year	365,417	62,427
Cash at the End of the Year	**202,872**	**365,417**

Statement of Service Performance

For the Year ended 31 March 2019

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 dinnner, annual golf day, and various other one-off events.

Grants & Scholarships approved during the year:	2019 Number	2019 Actual ($)	2019 Budget ($)	2018 Number	2018 Actual ($)
Annual Grants	4	109,259	108,000	4	107,139
Special Fund Grants	6	159,073	160,000	10	223,280
Summer Research Scholarships	25	102,000	102,000	19	78,000
Otago Medical Research Society Award Sponsorship	2	1,500	1,500	1	1,000
Total	**37**	**$ 371,832**	**$ 371,500**	**34**	**$ 409,419**

The full financial report of the Otago Medical Research Foundation for the year to 31 March 2019 was authorised for issue by the Chairperson of the Council. The full financial statements applied Public Benefit Entity Simple Format Reporting - Accrual (Not-For-Profit). The auditor expressed an unqualified opinion. The summary financial report has been examined by the auditor for consistency with the full financial report. The auditor has expressed an unqualified opinion.

AUDITOR'S REPORT

Crowe Horwath
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New Zealand Audit Partnership
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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 2019, the summary statement of financial performance, summary statement of movements in equity, summary statement of cash flows, and summary statement of service performance for the year then ended are derived from the audited financial statements of Otago Medical Research Foundation (the "Foundation") for the year ended 31 March 2019.

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 5 August 2019.

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 performance report or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed on the other information that we obtained prior to the date of our auditors' report, we concluded that there is a material misstatement of this other information, we are required to report that fact.

Crowe Horwath.
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Council's Responsibility for the Summary Financial Statements

The Council is 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 Horwath

Crowe Horwath New Zealand Audit Partnership
CHARTERED ACCOUNTANTS
Dated at Dunedin this 5th day of August 2019

Otago Medical Research FOUNDATION

Annual Report to 31st March 2019
& Notice of Annual General Meeting

Charities Number: CC33444

OMRF.ORG.NZ