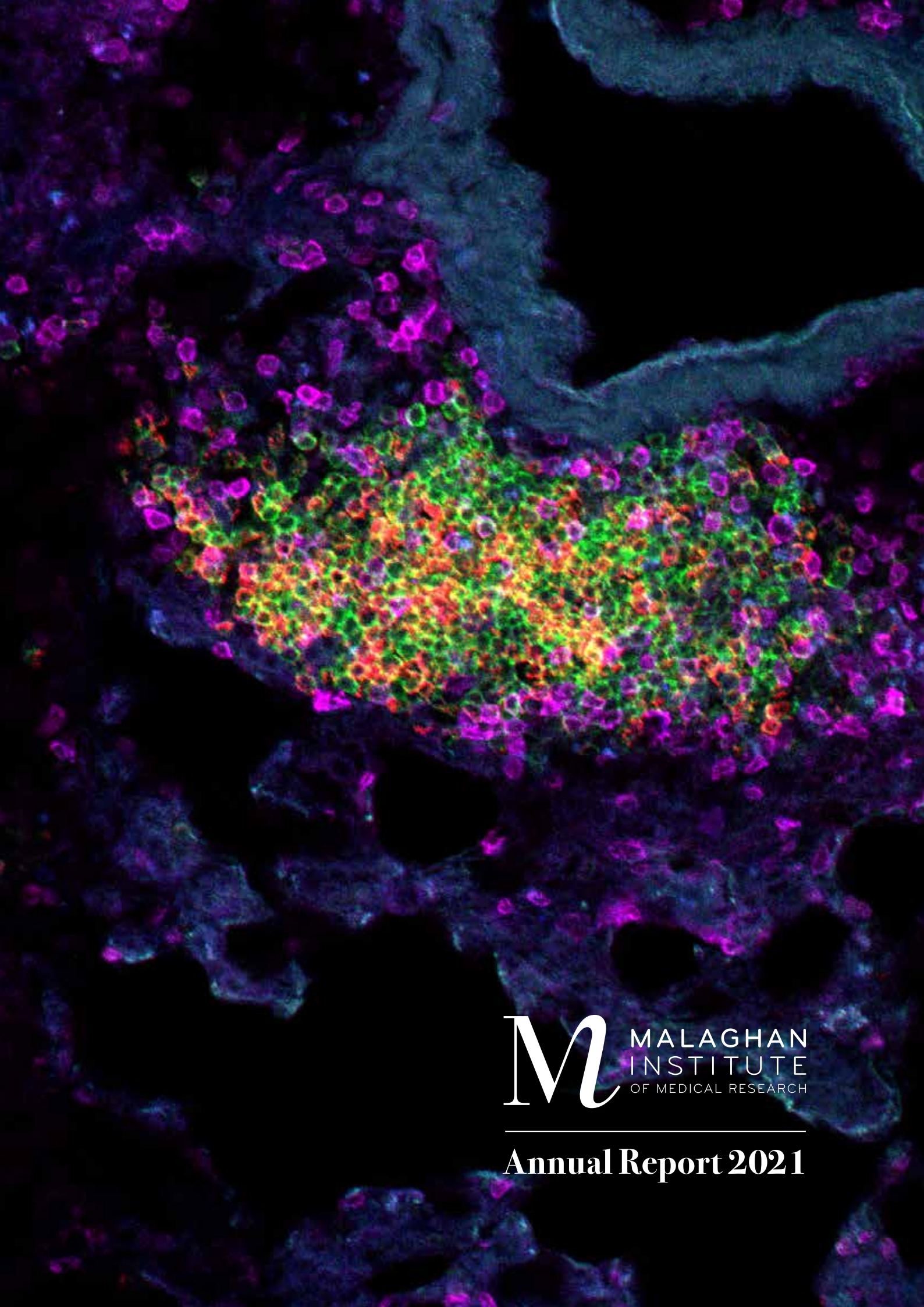


MALAGHAN INSTITUTE OF MEDICAL RESEARCH

Annual Report 2021

Contents

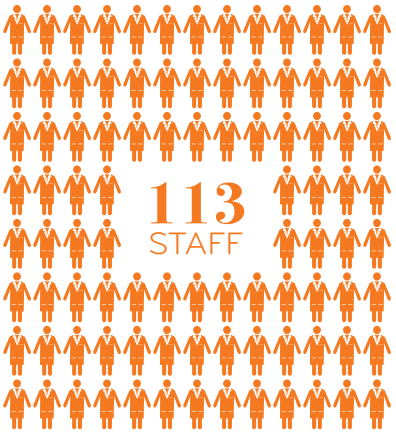
COVER IMAGE

Building better vaccines starts in the lung – the site where most viruses and pathogens first make contact. By stopping viruses 'at the door', we both increase the effectiveness of vaccines, and prevent pathogens from infecting us long enough to pass on to others.

The cover image shows iBALT – a specialised lymphoid tissue that forms in the lung following exposure to a virus. We see immune cells clustering in the iBALT producing IgA antibodies. The Vaccine Evaluation team, led by Dr Lisa Connor, is investigating ways to prime these immune cells against airborne pathogens, thereby quickly eliminating the threat and preventing their spread to other areas of the body.

Year in review

OUR PEOPLE



8 PRINCIPAL INVESTIGATORS

14 POSTDOCTORAL RESEARCH FELLOWS

8 PHD & MASTER'S STUDENTS

KEA WORLD CLASS NEW ZEALANDER AWARD
PROFESSOR GRAHAM LE GROS

DR FRAN PRIDDY
APPOINTED TO CEPI SCIENTIFIC ADVISORY COMMITTEE

RESEARCH

39 SCIENTIFIC PUBLICATIONS

5 CLINICAL STUDIES

$12m CONTESTABLE GOVERNMENT FUNDING

9 PATIENTS TREATED IN ENABLE CAR T-CELL TRIAL

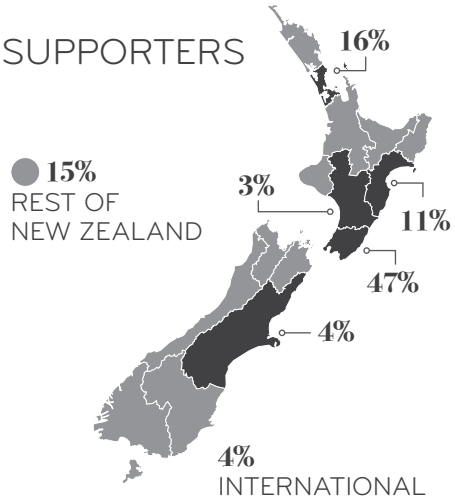
KA MĀTAU, KA ORA – COVID-19 VACCINE STUDY LAUNCHED

CORE FACILITIES

- Genomics
- Flow cytometry
- Bioinformatics
- Biomedical Research Unit
- Bioimaging
- PC3 laboratories

PHILANTHROPY

SUPPORTERS



RAISED OVER **$250,000** AT **5** CHARITY GOLF DAYS

$6.2m RAISED IN PHILANTHROPIC SUPPORT

30% OF TOTAL FUNDING

About us

The Malaghan Institute is New Zealand's world-class independent biomedical research institute with a focus on breakthrough discoveries in immunology and immunotherapy.

Our journey started more than 50 years ago with a vision to improve the lives of all New Zealanders through advancements in medical research. In 1966, a group of far-sighted New Zealanders set a course for world-class independent medical research to be carried out in Wellington. In 1986 the organisation, then the Wellington Cancer and Medical Research Institute, was renamed the Malaghan Institute of Medical Research, in recognition of the generosity of Tip Top founder Len Malaghan and his wife Ann, whose donation of shares from the company seeded the Institute.

Today, our cutting-edge research and clinical trials are advancing understanding of the immune system and its relationship to human health. With a world-leading technology platform to deeply interrogate these relationships, leading scientists and worldwide collaborations, we are leveraging new knowledge to find better treatments and cures for disease and create economic opportunities for New Zealand.

At the current pace of advances and discoveries in immunotherapy, we see a future where diseases can be prevented and cured through an immune-based approach and treatment is accessible and affordable for all.

Together, we can harness the power of the immune system and save lives.

From benchtop to bedside

Fundamental research meets clinical development at a single site at the Malaghan Institute. By bringing together world-class immunological research with clinical expertise, we are uniquely positioned to translate new discoveries into new therapies to prevent, treat and cure disease.

Owned by New Zealand, for all New Zealanders

Our value to New Zealand lies in our independent status as a research organisation, backed by the community. As a registered charity, we are owned by New Zealand, for the benefit of all. Through a range of funding sources, including philanthropic, government and corporate, the Malaghan Institute has developed the capability and expertise to deliver significant health and economic benefits to New Zealand, while retaining the freedom, flexibility and spirit to make breakthrough discoveries.

Key areas of research and discovery

CANCER

including blood, skin, brain, breast and colon cancers

INFECTIOUS DISEASE

including COVID-19, influenza, hepatitis B, malaria and parasitic diseases

ALLERGIC AND INFLAMMATORY DISEASE

including eczema, allergic sensitisation, food allergy, gut disease and autoimmunity

IMMUNE HEALTH

including metabolic disease, gut and microbiome nutrition

Chairman's report

We continue to play a key role in assisting the Government with its COVID-19 response. Our Director has led a team under the Vaccine Alliance Aotearoa New Zealand – Ohu Kaupare Huaketo (VAANZ) that has brought together the resources of the University of Otago and Victoria University of Wellington and other local and international collaborators, providing advice and science capacity for vaccine development now and into the future.

At the same time, our clinical programmes have been breaking new ground. These programmes – in cancer and allergic disease – have shown encouraging results, yet their success also shines a light on the pressing need for funding to enable them to fully deliver.

Philanthropic support has always been an intentional and vital part of the Malaghan Institute. We are so appreciative of those in the community who see the long-term value of our work. It is encouraging to everyone at the Institute – researchers, support staff and Trustees – that we see this support continuing to grow. We are also anticipating some exciting initiatives on the back of international support in the coming year, which we look forward to sharing in due course. Our discoveries are also being reviewed by potential international partners to explore a clinical trial for a novel treatment for hepatitis B.

During the year we lost friend and Trustee, Associate Professor John Carter, which was a very sad loss for his family and the community. As Deputy Chair, John was committed to improving health outcomes for New Zealanders through medical research. He will be sorely missed.

Following the retirement last year of Trustees Bryan Johnson, Dan Williams and David Mossman, and their elevation to Distinguished Trustees, we have been fortunate to recruit two new Trustees – Dr Michelle Sullivan and Dr Maia Brewerton. Both bring strong science credentials to the Board, and will provide invaluable contributions to the Institute's future governance. They also bring a unique Auckland perspective, complementing our geographically-dispersed Board – something that is important for a nationally-focused institute like ours.

I would also like to acknowledge on the Institute's behalf the recognition our Director Prof Le Gros received this year as a Kea World Class New Zealander. The event ceremony in Auckland, which we attended with members of the Hugh Green Foundation, was a spectacular evening honouring the achievement of outstanding New Zealanders – of which Prof Le Gros was well-deserving.

The coming months will be significant for the future of the Institute as we seek to renew the Independent Research Organisation funding from the Health Research Council of New Zealand (HRC). This funding has provided much stability for advancing our science programmes over the past seven years. It will be a challenging time, as competition for funds remains high during these periods of COVID-19 hardship, and the new health reforms from the HRC will bring other challenges. However, the focus on research to improve health outcomes will remain critical in this country, so I remain confident that the Malaghan Institute will continue to play a central role.

My thanks and appreciation to all those who engage with and support the work of the Institute.

Mr Graham Malaghan | CHAIRMAN
ONZM Hon DSc FCILT

Director's report

The science of immunology is now front and centre of global efforts to respond effectively to a changing COVID-19 pandemic. With the emergence of Delta and other variants challenging the limitations of current vaccine strategies, it is clear that immunologists need to redouble their efforts in developing the next generation of vaccines. What we need now are vaccines that stimulate long-lived broad immunity that will neutralise all current and emerging COVID-19 variants in global circulation.

Professor Ian Hermans, Dr Fran Priddy and their colleagues involved with VAANZ – Ohu Kaupare Huaketo are at the forefront of this effort. They have made great progress in applying their skills and technologies to build a vaccine that will cover the Delta variant. The intention is to take this vaccine candidate all the way through to manufacture and clinical trials late next year.

Furthermore, the clinical study Ka Mātau, Ka Ora (from knowledge comes wellbeing) is now underway with its goal to examine the efficacy of the Pfizer-BioNTech vaccine in Māori, Pasifika and over 65-year-olds. The results from this study will be important for ongoing evaluation of the national COVID-19 vaccine programme. I would like to thank Dr Priddy for taking the lead of the Institute's vaccine response effort. Her international experience in vaccinology and infectious diseases has been critically important for both New Zealand and the Malaghan Institute.

Although our COVID-19 vaccine expertise and research currently dominates our communications, our cancer, allergic and inflammatory disease and immune health research programmes have also made meaningful advances in improving health outcomes.

Professor Franca Ronchese and her team have made significant headway identifying one of the underlying mechanisms that lead to allergic sensitisation in the skin, the results of which will surely have a huge impact on wider international allergic disease research. In collaboration with Dr Maia Brewerton, Prof Ronchese and her team hope to be able to apply their understanding and knowledge in a Health Research Council funded clinical trial to improve skin allergic disease outcomes in Māori children who suffer greatly from this disease.

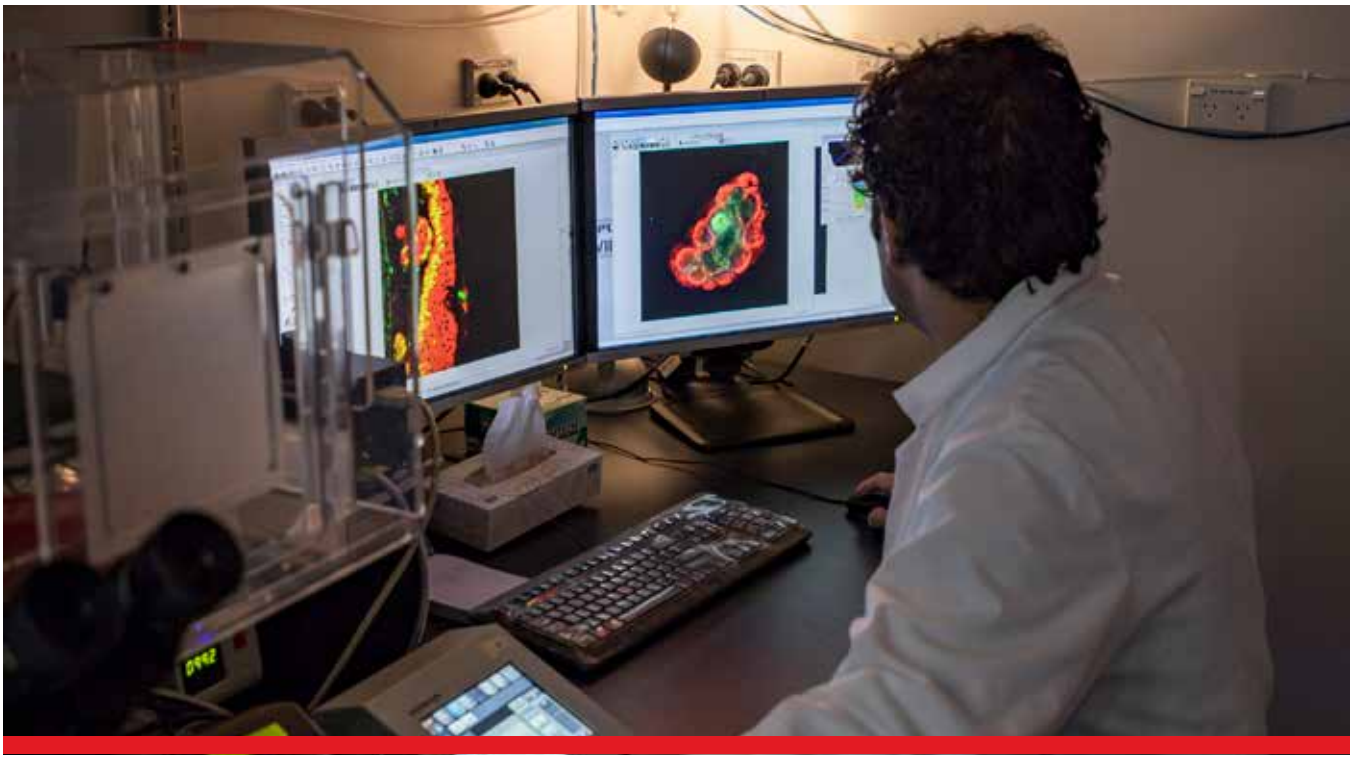
In the CAR T-cell cancer therapy space, Dr Rob Weinkove and his team are looking forward to what the next clinical phase of CAR T-cell technology will look like in New Zealand as we progress towards phase II studies. Central to this will be innovating the way we manufacture and deliver CAR T-cells, with some exciting developments ahead in the coming year. Dr Rachel Perret and colleagues are also pioneering new ways to further enhance and develop the use of CAR T-cell therapy.

Elsewhere, Dr Olivier Gasser and his team are offering new insight into the role of the microbiome and food on the body's metabolism and inflammatory markers as part of the High-Value Nutrition Ko Ngā Kai Whai Painga National Science Challenge. In addition, the multi-year project investigating the health benefits of controlled human hookworm infection led by Mali Camberis is in its final phases of analysing and drawing conclusions.

Thank you to all our wonderful supporters who believe in the scientific endeavours of the Malaghan Institute and our vision to improve the lives of all New Zealanders.

We value your trust and ongoing support.

Professor Graham Le Gros | DIRECTOR
CNZM, FRSNZ, FRCPA (Hon)
BSc, Dip Immunol, MPhil, PhD



Cancer

Cancer immunotherapy offers the exciting potential of highly-personalised treatments, individually targeted to a person's cancer and immune system.

Advancements in immunotherapy have fundamentally changed the way we approach cancer treatment. By using the body's own immune system to target and destroy cancer cells we can develop gentler, more effective treatments that can also prevent a patient's disease from recurring.

Many cancers are a result of the immune system failing to properly recognise cancer cells as a threat, allowing them to persist and grow in the body undisturbed. At the Malaghan Institute, our cancer immunotherapy programmes aim to stimulate specific cancer-killing immune cells against a patient's cancer – rallying this powerful arm of the immune system against their disease.

CAR T-CELL THERAPY

Chimeric Antigen Receptor (CAR) T-cell therapy works by redirecting a patient's own immune cells (T-cells) in the laboratory to identify and destroy cancer cells when they are returned to the patient. The T-cells can act as 'living drugs', providing long-term protection against relapse, similar to a vaccine.

The Malaghan Institute's CAR T-cell programme has two main streams: the ENABLE clinical trial – a phase I dose escalation study of the Institute's unique CAR T-cell construct – and the Freemasons CAR T-cell Research Programme, aimed at improving and extending this lifesaving technology.

ENABLE clinical trial

The ENABLE phase I dose escalation safety trial aims to treat certain types of relapsed and refractory B-cell non-Hodgkin lymphoma in patients who have exhausted other treatment options.

After getting underway at the end of 2019, the dose escalation cohort of the trial is nearing completion, with nine patients receiving CAR T-cell therapy so far. Assuring equitable access to the ENABLE trial has been a priority. The trial has been supported by Leukaemia & Blood Cancer New Zealand, which has provided travel and accommodation support for participants beyond the Wellington region. Principal Investigator Dr Robert Weinkove is also working with Te Aho o Te Kahu, the Cancer Control Agency, on the design of a future national CAR T-cell service.

We are planning an extension to the ENABLE trial to explore ways of improving the manufacture of CAR T-cells – including automating parts of the production. The extension will also focus on improving the participant experience through outpatient CAR T-cell delivery and by assessing simpler ways to obtain enough cells for CAR T-cell manufacture.

Freemasons CAR T-cell Research Programme

We are only just scratching the surface of the potential of CAR T-cell technology. The Freemasons CAR T-cell Research Programme is tasked with leveraging this revolutionary immunotherapy – to not only make it more effective at treating blood cancers, but to extend it to other forms of cancer.

- With assistance from the Ministry of Business, Innovation and Employment (MBIE) Partnership Scheme we have been investigating an automated, closed-system method of growing CAR T-cells, with a collaboration underway with Swiss pharmaceutical company Lonza using their automated Cocoon® system. Automation provides the potential to safely and effectively upscale CAR T-cell production to treat more patients.
- Transforming a patient's T-cells into cancer-killing CAR T-cells involves adding a short genetic sequence (CAR) into the cell. Where this sequence inserts itself in the recipient's DNA, and how many copies, is an important area of safety and quality research. With the assistance of the Maurice Wilkins Centre, we are developing a new technique to assess this.
- A separate project, supported by MBIE, involves adding an extra protein tag to CAR T-cells. This tag can act as a 'safety switch' that matches a clinically available drug. If the CAR T-cells overreact and cause toxicities, the drug can be administered and used to rapidly remove them from the body. This will be important for the safe use of future CAR T-cell therapies that are not as well understood as current CAR products, such as the one used in ENABLE.
- We have been awarded funding by the Maurice Wilkins Centre to develop dual CAR T-cells that can recognise two different tumour cell targets at once. Dual CARs have the potential to counter the common situation that tumours can change their protein expression, sometimes losing the target antigen that is the focus of the immune therapy. This risk should be lower with CAR T-cells that can recognise two targets instead of just one, and this may be critical to broaden the scope of CAR T-cell therapies to a wider range of cancers.
- An earlier-stage project is investigating improved methods of getting CAR T-cells to kill 'bystander' tumour cells. This project involves arming CAR T-cells with a special enzyme that can convert a prodrug into a cancer cell-killing drug in the vicinity of the tumour.

IMPROVING IMMUNE RESPONSES IN SOLID TUMOURS

One of the limitations in treating solid tumours is accessing the interior of the tumour to deliver therapy. The internal environment within a tumour is often significantly different from the exterior, and cells within the tumour often express different markers. This makes it difficult for existing cancer drugs to fully penetrate a tumour, only delivering the therapy to its surface. In addition, solid tumours can suppress the immune system within the tumour, making immunotherapies less effective. Unless a treatment can eradicate 100% of the cells within a tumour, there is a significant chance the cancer will return or spread to other sites in the body.

A common factor of many solid tumours is that they exclude oxygen from their interior. This oxygen-poor, or hypoxic, environment helps the tumour resist treatment and prevents the immune system from gaining access to its interior. We have been working on leveraging this hypoxic internal environment of a tumour against itself, developing ways to deliver cancer-killing drugs directly into the heart of a tumour. Our collaborators at the Auckland Cancer Society Research Centre have developed a hypoxia-activated prodrug – tarloxotinib – which only becomes activated in the hypoxic regions of a tumour lesion and is inactive elsewhere in the body. We have shown that treatment with this drug effectively eliminates hypoxic regions, enabling immune cells to penetrate further and kill more tumour cells. This drug may hold potential for improving immunotherapy to solid tumours, such as lung cancer, which is very prevalent in New Zealand, and disproportionately affects Māori and Pasifika communities.

PREVENTING SECONDARY CANCERS

Most people don't die from their initial, or primary, cancer. It's when the cancer metastasises, spreading to other parts of the body and forming new tumours, that people die from this disease. Knowing what drives cancer cells to spread to the lung, the liver and other parts of the body is a vital step to preventing this from happening.

We have been investigating whether cancer cells that lack energy-production mechanisms are more likely to spread throughout the body. We are also looking at the role specific immune cells, including neutrophils, play in assisting cancer cells that have travelled to a new site in adapting to their new environment.

Allergic & inflamatory disease

Allergic and inflammatory diseases are characterised by the immune system activating when it shouldn't – resulting in chronic and often debilitating inflammation that gives rise to disease.

While the symptoms and effects of allergic and inflammatory disease are well understood, what triggers a person's immune system to overreact is not. This is largely because these changes happen at the genetic level, sometimes decades earlier. If we can find ways to treat the underlying causes of allergic and inflammatory disease, and not just treat the symptoms, we have the opportunity to improve the lives of many millions of people suffering every day.

Thanks to steady advancements in analytical and bioinformatic tools, we are finally getting to 'deep dive' into the genetics of key immune cells, to gain a clearer picture of what's pushing otherwise healthy immune cells to cause allergic and inflammatory disease.

HELMINTHIC THERAPY RESEARCH

Parasites have long been known to influence their hosts' immune system, suppressing aggressive immune responses that would otherwise kill them, while leaving the rest of the immune system untouched – a mechanism evolved over millions of years. In parallel, many allergic and autoimmune diseases are a result of the immune system attacking healthy cells in the body. One of the core goals of our helminthic research is to understand how these tiny microorganisms achieve this remarkable feat, and whether this can be harnessed to help fight disease.

Healthy volunteer study

The first phase of our healthy volunteer study to explore the therapeutic potential of human hookworms is wrapping up, with 21 participants treated with a controlled dose of hookworm. Over the course of the 12 month infection period, regular samples were collected and processed to determine what immune and physiological changes happened over the course of the infection.

The data generated from this study will inform how the worms used in this study – Necator americanus – influence their host's immune system, and help set the direction for future research. We are currently seeking approval to conduct an extension study designed to more closely examine the earlier stages of hookworm infection.

Ulcerative colitis study

In late 2020, we began a second clinical study to investigate the feasibility of using human hookworms as a medication-free maintenance therapy for ulcerative colitis, an inflammatory bowel disease. Recruitment for this study has finished, with most participants part-way through their 12 month infection and observation period.

GMP hookworm product

Central to the ongoing success of our helminthic therapy research is the sourcing and manufacture of human hookworms. One of the big challenges faced is the standardisation and quality of the hookworm product.

We continue to improve and refine our methods for harvesting and administering hookworms, with the goal of developing a GMP (good manufacturing practice) product that meets safety and quality standards. We are investigating methods for freezing and preserving juvenile hookworms at specific stages of development to further improve consistency of hookworms administered across participants.

We are also investigating the microbial burden within the hookworm product. Harvested hookworms have a significant amount of microbes present within each sample. By better understanding which microbes are present in these samples, we can develop improved methods of cleaning larvae, or where appropriate, by knowing which bacteria is present in a sample we can implement release criteria – similar to products like probiotics that contain live cultures of microorganisms – around the hookworm product based on specific microbial signatures.

DENDRITIC CELLS

Dendritic cells remain a key cell of interest for many research programmes at the Malaghan Institute. Their role in finding and presenting antigens to the rest of the immune system means they are involved in the vast majority of immune responses – good or bad. By better understanding how dendritic cells initiate immune responses, both helpful and harmful, we may be able to find opportunities to develop therapies that prevent harmful immune responses while leaving the rest of the immune system fully functional.

Link with allergic skin disease

Professor Franca Ronchese and Dr Maia Brewerton were awarded a $1.2 million Health Research Council (HRC) Project Grant to investigate the link between dendritic cells and allergic disease in the skin. The three-year programme, which will compare inflammatory responses in healthy individuals with those suffering allergic disease, is part of wider research to find new, more effective ways to treat skin disease such as eczema, and provide relief for those with debilitating allergic conditions.

Immune system discovery

HRC-funded research, published in *Nature Communications*, reveals that the same subset of immune cells – dendritic cells found on the skin – can start different types of immune responses depending on the conditions they are exposed to. It was previously thought that different populations of dendritic cells were responsible for initiating different immune responses in the body.

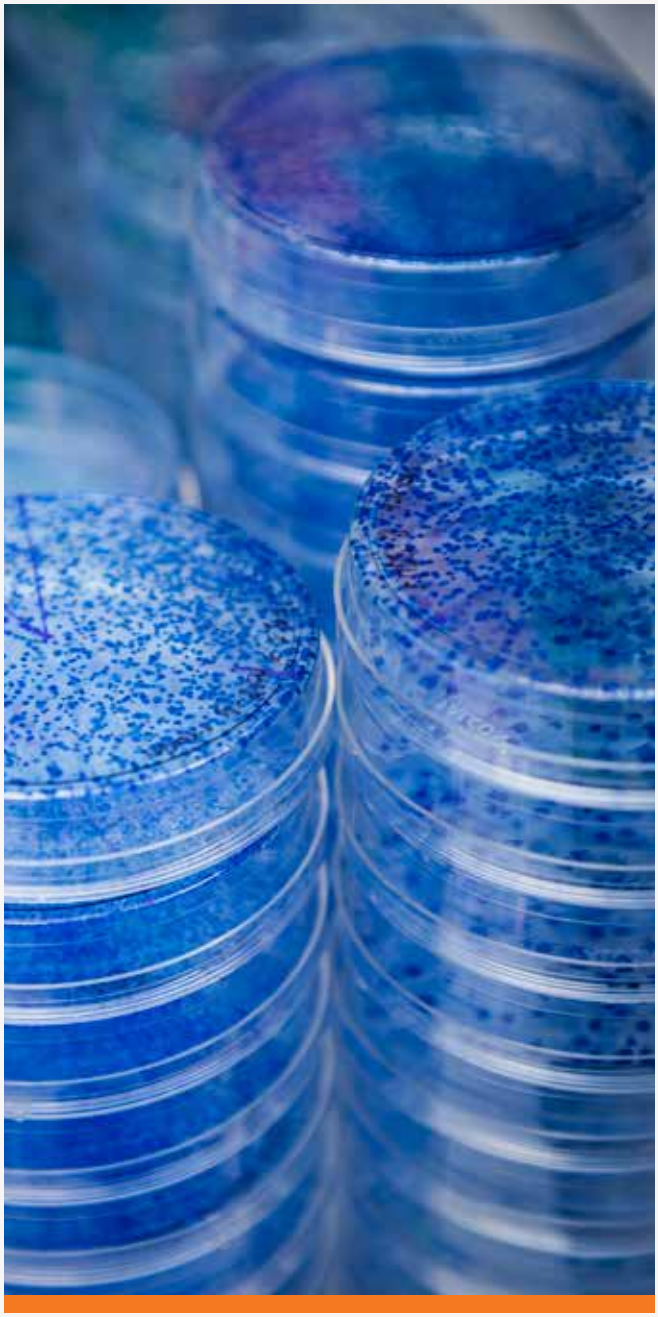
Interaction with T-cells

Dr Lisa Connor and her team have launched a Marsden-funded project looking at novel cell-surface protein interactions between dendritic cells and T-cells. By better understanding the cell-cell communication between these key immune cells, they may be able to identify novel targets for immunotherapies or vaccines.

PARASITIC WORMS AND GUT INTEGRITY

We have been investigating the relationship between parasitic worm infection in the gut and intestinal permeability. The integrity of the intestinal barrier is key to maintaining health as an increase in permeability – a loss of barrier function – is linked to a wide range of inflammatory and allergic diseases such as diabetes, rheumatoid arthritis and irritable bowel syndrome.

The intestinal barrier relies on a dynamic relationship between the gut microbiome, intestinal cells, mucus and immune cells. We are investigating these complex relationships and exploring opportunities to improve barrier function via regulation of inflammation-reducing immune cells through parasitic worm infection.



ALLERGIC SKIN DISEASE

The skin is our largest organ and our most important barrier to unwanted microorganisms and pathogens. The skin's ability to protect us from invasion is a vital immune-mediated function. For many people with allergic or inflammatory disease in the skin such as eczema, a chronic loss of barrier function or integrity is strongly correlated with the worsening of their disease.

Excessive inflammation can cause the skin barrier to 'leak', letting through bacteria or allergens. This in turn causes more inflammation as the body fights the unwanted intruders – a vicious cycle that gives rise to disease.

Better understanding how immune cells in the skin act to keep this barrier functioning as intended, and investigating why this sometimes fails, is an important area of research at the Malaghan Institute and an exciting area for developing new therapies.

Phototherapy

Phototherapy is currently one of the most effective treatments for allergic skin conditions like eczema, but why it works so well is yet to be fully understood. The therapy involves shining ultraviolet (UV) light on a patient's skin. Because the wavelength – or bandwidth – of light used is very narrow, the treatment avoids the harmful penetrative effects of UV radiation, acting only on the epidermis where the disease is present.

In 2021 we published results of a phototherapy clinical study investigating whether key immune cells in the skin (called MAIT cells) can be inhibited by applying topical folic acid in conjunction with phototherapy to reduce inflammation and improve barrier function. The paper, published in *Allergy*, has shown this to be the case, warranting further investigation.

Genetic link to skin inflammation

New research has identified a key gene that, in the right acidic conditions, can stop T-cells from causing excessive inflammation in the skin.

We found that for many people suffering from eczema and other allergic skin conditions, a deficiency in their GPR65 gene means their T-cells aren't as good at determining the pH of their environment, causing them to activate when they shouldn't, giving rise to inflammation. Determining exactly how GPR65 functions across different types of immune cells may lead to new targeted treatment options for atopic disease.

Basophils' dual role in allergic responses in the skin

A publication in the *Journal of Allergy and Clinical Immunology* suggests that basophils – a rare type of immune cell – simultaneously contribute to dangerous inflammation in the skin while working to suppress that same inflammation. The results, while contradictory, highlight the importance of continuing to research these poorly-understood cells and their potential significance in emerging immunotherapies.

NEW UNDERSTANDING OF CD4 IMMUNE RESPONSES

Our ongoing collaboration with Harvard Medical School is changing how we think about cells in the immune system and the role they play in generating immune responses. Recent findings published in *Nature Immunology* propose that for CD4 immune cells, they exhibit a spectrum of different responses depending on the type of threat they encounter, flying contrary to established thinking of 'one cell equals one function'.

Infectious disease

By better understanding how the immune system protects us from pathogens, we can design better, more effective treatments and vaccines for a range of infectious agents, including viruses, parasites and bacteria.

As New Zealand's infectious disease immunologists, the Malaghan Institute has a long history investigating how the immune system encounters, categorises and responds to the various infectious agents that are a constant presence in our environment. This expertise was brought into the national spotlight at the onset of the COVID-19 pandemic, and continues to contribute to the national pandemic response.

VACCINE ALLIANCE AOTEAROA NEW ZEALAND – OHU KAUPARE HUAKETO

Established in 2020, the Government-funded Vaccine Alliance Aotearoa New Zealand – Ohu Kaupare Huaketo (VAANZ) has brought together a multidisciplinary team of local and international collaborators with proven capability in vaccine research, development, and scale-up manufacturing.

One of the overarching goals of VAANZ is to help ensure New Zealand remains resilient in the face of global pandemics through identifying opportunities for 'end-to-end' vaccine development (including research, manufacture and clinical trials) within New Zealand, and staying plugged in to global vaccine developments.

Homegrown COVID-19 vaccine candidates

While today's COVID-19 vaccines have proven effective in limiting the spread of COVID-19 and preventing people from experiencing the worst of its symptoms and dying, what we need for the long term are vaccines that give protective long-term immunity and are effective against viral variants.

VAANZ has been undertaking research and development of a number of second-generation COVID-19 vaccine candidates, with initial data showing promising results.

This includes a recombinant spike protein vaccine which has been designed primarily as a booster to raise waning antibody levels and retrain the immune system to recognise virus variants in vaccinated individuals and patients previously recovered from COVID-19. VAANZ is also part of a trans-Tasman collaboration with the University of Melbourne and local biotech Avalia Immunotherapies developing a pan-SARS-CoV2 virus-like particle based vaccine as a second-generation vaccine and booster shot.

Ka Mātau, Ka Ora

In early June 2021, VAANZ launched a clinical study looking at how our unique New Zealand population responds to the Pfizer-BioNTech COVID-19 vaccine. The study, Ka Mātau, Ka Ora (from knowledge comes wellbeing), will track and monitor participants' immune responses to the vaccine over the course of a year.

Ka Mātau, Ka Ora has a focus on gathering vaccine response data for Māori and Pasifika populations. While we are not expecting any significant difference in terms of protective benefit against COVID-19, the study may identify risks associated with specific comorbidities, as well as opportunities for more effective vaccination strategies for the New Zealand population.

As New Zealand has so far managed to avoid widespread transmission of the virus, it also provides a unique opportunity to study vaccine immune response in a largely COVID-19-naive population. Participants were also given the option to take part in a side study investigating the correlation between dietary fibre and their immune response to the vaccine. The study aims to provide insight into whether certain foods or diets can offer additional protective benefit.

International appointment

Dr Fran Priddy, VAANZ Executive Director, was among international health and vaccine experts appointed to the Coalition for Epidemic Preparedness Innovations (CEPI) Scientific Advisory Committee in 2021. The committee is tasked with providing guidance and recommendations on CEPI's vaccine research and development programmes and broader outbreak response efforts, both in tackling COVID-19 and in planning for future epidemics and pandemics.

HEPATITIS B

Using the unique T-cell stimulating technology developed in collaboration with the Ferrier Research Institute – initially developed for cancer vaccines – work has continued on a vaccine for therapeutic treatment of chronic hepatitis B virus. In collaboration with Avalia Immunotherapies, we have been gathering preclinical data and are currently testing this vaccine *in vitro* using clinical samples.

MALARIA

The HRC-funded collaboration between the Malaghan Institute, Ferrier Research Institute, University of Melbourne and Avalia Immunotherapies continues to work through potential protein candidates that may serve as the foundation for a novel vaccine against the malaria-causing parasite *plasmodium*.

INFLUENZA

Many infectious agents, such as the influenza virus, infect people via the airway – infecting cells in the lung and nasal passages before spreading throughout the body. If we can design vaccines that prime cells found in these tissues – tissues which generate a lot of mucus – over others, then it may be possible to intercept these infectious agents before they spread throughout the body. This could result in a quicker immune response to the virus and lower the chance of disease symptoms.

Applying this approach, we are continuing to develop mucosal-specific vaccines against influenza, in collaboration with the Ferrier Research Institute. We have been developing and screening numerous mucosal 'adjuvants' – immune cell stimulants – to identify which ones generate the best response, before preclinical and *in vivo* studies.

Immune health

Keeping our immune system healthy helps keep the rest of our body healthy. A healthy, responsive immune system is more efficient, more resilient, and better able to protect us from infection and disease.

Immune health starts in the gut. While the bulk of the immune system is found in the intestinal tract, immune interactions in the gut have far-reaching impacts throughout our body including the skin, brain, and lungs. By better understanding the relationship between gut-resident immune cells, our diet and the rest of our immune system, we can design new strategies to improve our health and fight disease.

DIETARY FIBRE AND THE IMMUNE SYSTEM

How our immune system fuels itself directly impacts its ability to protect us from disease. Understanding what fuels our immune cells, and what dietary components influence this can help boost our immune response to disease as well as things like vaccines.

Of the many ingredients immune cells use to keep themselves healthy, dietary fibre is a key molecule of interest. Dietary fibre ferments in the gut into short-chain fatty acids which are taken up by cells – including immune cells – to be metabolised (used to fuel cellular processes including energy production). What you eat, specifically how much fibre is in your diet, directly impacts the amount and types of short-chain fatty acids that are in the gut, which in turn affects the performance of a wide range of immune cells.

Immune responses to vaccines

We have been working on a project investigating dietary fibre consumption and responses to vaccines, with potentially higher fibre diets being linked with improved vaccine response. Initially focused on the influenza vaccine, we are now also investigating the COVID-19 vaccine response as part of the Ka Mātau, Ka Ora clinical study.

Immune cell metabolism

Different immune cells require different fuel sources. By understanding the metabolic requirements of different immune cells, we may be able to develop methods to improve their function through diet, which may help counteract disease. We are currently gaining ethical approval to conduct an intervention study for diabetic patients to investigate whether the benefits of high fibre diets relate to changes in immune metabolic parameters.

CHINESE HERBAL MEDICINE STUDY

A clinical study seeks to better understand the impact certain Chinese herbal medicines have on the immune system and human health, and whether they can be used as a potential treatment for a range of inflammatory conditions. The study began recruiting patients in 2021, with the aim to better understand the effect *Indigo naturalis*, also known as Qing-Dai, has on the immune system and whether it can be applied in a clinical setting.

MAIT CELLS AND MĀNUKA HONEY

In research partly funded by the High-Value Nutrition Ko Ngā Kai Whai Painga National Science Challenge, we have uncovered a novel way mānuka honey helps stimulate the immune system to fight bacteria. In collaboration with the Ferrier Research Institute, findings published in the Royal Society of Chemistry's *Food & Function* journal identified that one of the main bioactive components in mānuka honey, the molecule methylglyoxal (MGO), could help activate specific bacteria-fighting immune cells.

EARLY DETECTION FOR NEURODEGENERATIVE DISEASE

Insights into how tumour cells use energy – in particular mitochondrial energy – has crossover application for other kinds of disease. In collaboration with Victoria University of Wellington, we are investigating whether bioenergetic gene expression profiles of certain neural cells can be used as an early predictor for neurodegenerative diseases such as Alzheimer's and Parkinson's, years before symptoms present.

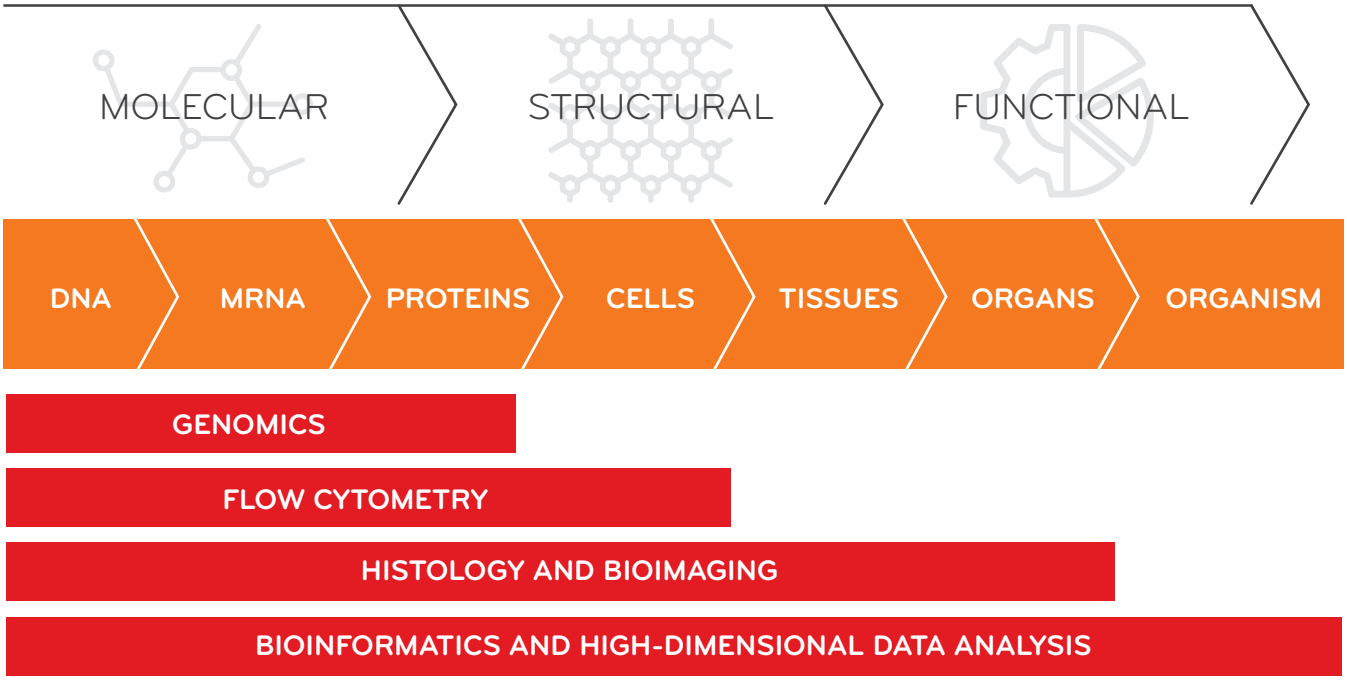
The collaboration has demonstrated that mitochondrial gene expression is reduced in the frontal cortex regions of the brain – near the olfactory region of the nasal cavity – in a preclinical model of depression, suggesting that it may be used to develop an assay for such diseases.

The aim of this two-year project is to develop a simple clinical test involving selective swabbing of the nasal cavity, adopting similar procedures to those used to screen for COVID-19.

Research technology

Our ambition is to provide cutting-edge, in-depth analytical technologies across all levels of biomedical research.

As technology evolves, so too does the opportunity to make discoveries and find new ways to treat disease. The Malaghan Institute has a number of core facilities – technical and analytical platforms that underpin research at the Malaghan Institute and also collaborate with other organisations to enable cutting-edge science across New Zealand in a wide range of industries.



CORE FACILITIES

Genomics
- Single cell analysis
- Genotyping

Flow cytometry
- High-dimensional spectral flow cytometry
- Cell sorting

Bioinformatics
- Genome assembly
- Project design
- Data visualisation

Biomedical Research Unit
- Animal husbandry
- Animal technology services

Bioimaging
- Histology
- Confocal microscopy
- Stereomicroscopy
- Compound upright microscopy
- Inverted microscopy
- Slide scanning

PC3 laboratories
- GMP cell therapy manufacturing
- Clinical-grade lentivirus manufacture

HUGH GREEN CYTOMETRY CENTRE

Fuelled by deep support from the Hugh Green Foundation over more than a decade, our cytometry centre gives our scientists access to state-of-the-art cell analysis and enables us to train our staff, students and the wider scientific community in the use of these modern technologies.

Flow cytometry

The Institute continues to expand its spectral flow cytometry capacity, with four Cytek Auroras now online at the Institute and a dedicated Spectral Flow Cytometry Specialist to support our scientists in the design, validation, and optimisation of their experiments.

Flow cytometry works by using lasers to excite fluorescent dyes that have been attached to a cell type of interest via an antibody specific for that cell. Each dye is selected for its unique spectral fingerprint – which allows users to reliably analyse tens of unique markers on a cell instantly. The suite now contains two 5-laser and two 4-laser instruments, increasing the breadth of scientific parameters that can be measured per instrument, dramatically increasing the amount and value of data generated in a single experiment.

Hugh Green Cytometry Centre staff are globally recognised as key opinion leaders in the field of full spectrum cytometry. Our staff have been invited to present at international workshops, webinars, and conferences. We have published gold standard protocols regarding best practices for full spectrum cytometry and have supported the publication of scientific research articles, highlighting the impact this technology is having on our ability to understand more about the immune response for the given disease being studied.

The Malaghan Institute will also be the first site in the southern hemisphere to house the new-to-market Aurora Cell Sorter, further improving our capabilities by allowing scientists to isolate live cells post-experiment for further studies.

New genomics tool

The installation of the BD Rhapsody allows us to prepare samples for single-cell RNA sequencing. As RNA degrades rapidly, having this technology on-site will give us the highest sample quality possible. This technology platform allows scientists to process around 20,000 cells at a time, providing an in-depth snapshot of each single cell's gene expression patterns. This gives a deeper understanding of the composition of immune cells and how the immune system is responding to stimuli in health and disease. It is a powerful tool when studying complex tissues or diseases such as the tumour micro-environment in cancer and can be employed to shed light on the development of allergy and atopic dermatitis, for example. Data from our trial experiment was of very high quality and has been included for publication in a manuscript currently under review looking at immune cell differentiation in the healthy skin.

Slide scanner

We recently acquired an Olympus VS200 Slide Scanner for bioimaging that can process up to 200 slides at a time. This allows us to digitally archive samples and extract greater detail from images by using software and algorithms to analyse and quantify signals acquired from a tissue section.

mRNA platform

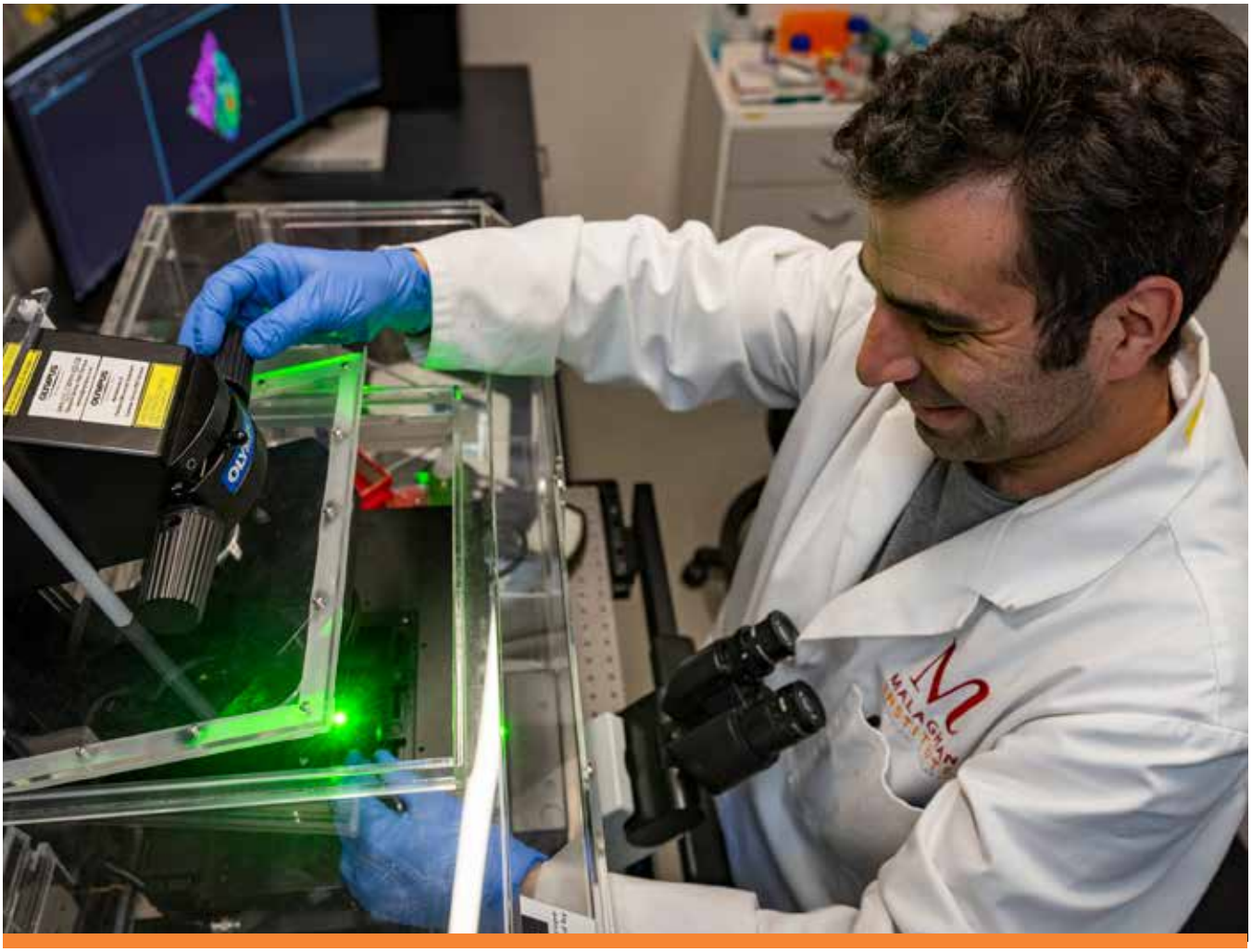
RNA vaccine technology represents one of the most disruptive technological breakthroughs in the treatment of human disease in decades. The wide-scale trialling and adoption of mRNA vaccines following the COVID-19 pandemic has opened the door for a host of potential applications. In parallel with VAANZ's research and development, and in conjunction with international collaborators, we have been progressing bringing RNA manufacturing capabilities to New Zealand.

BIOMEDICAL RESEARCH UNIT

Our Biomedical Research Unit (BRU) supports every aspect of fundamental research at the Malaghan Institute, providing preclinical models to simulate human disease complexity. In our research, our use of animals is limited to mice, whose immune system is surprisingly similar to that of humans. We do so with care and consideration, and only where this is the best path to gaining the understanding that can lead to potential treatments and cures.

The Malaghan Institute recently signed an openness agreement, led by the Australian and New Zealand Council for the Care of Animals in Research and Teaching, pledging openness in animal research and teaching in New Zealand. The objective of the agreement is to ensure that the public are well informed about animal research including the benefits, harms, and limitations.

The facility also underwent a number of equipment upgrades, including new skateboard trolleys and a secondary cage wash to improve processing and build extra redundancy into their operations.



Science leadership

PROFESSOR GRAHAM LE GROS (DIRECTOR)

CNZM, FRSNZ, FRCPA (HON), BSC (MASSEY), DIP IMMUNOL (OTAGO), MPHIL, PHD (AUCKLAND)

Professor Le Gros leads both the allergic and parasitic disease, and hookworm clinical therapy research programmes. His research focuses on understanding how the immune system responds to allergens or parasites in the skin and lung.

PROFESSOR MIKE BERRIDGE

BSC, MSC (HONS), PHD (AUCKLAND)

Professor Berridge leads the cancer cell biology research programme. His current research interests include cell energy metabolism in cancer metastasis, the role of mitochondrial transfer between cells in tumour biology, and using bioenergetic changes in brain sensory neurons to develop an early detection test for neurodegenerative diseases.

DR RACHEL PERRET

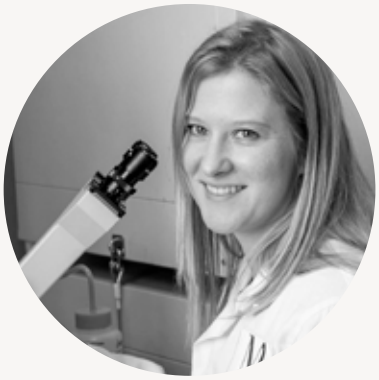
BSC (HONS), PHD (OTAGO)

Dr Rachel Perret is a Team Leader in the Malaghan Institute's Freemasons CAR T-cell Research Programme. Her research aims to build on this clinical programme, identifying ways to design better, safer, and more broadly applicable CAR T-cell therapies for both blood cancers and solid tumours.

DR FRANCES PRIDDY

MD (UCSF), MPH (UCSF), FELLOW, AMERICAN COLLEGE OF PHYSICIANS

Dr Priddy is Clinical Evaluation Director at the Malaghan Institute and Executive Director of Vaccine Alliance Aotearoa New Zealand – Ohu Kaupare Huaketo, co-leading the programme and managing clinical partnerships for domestic and international COVID-19 vaccines.



DR LISA CONNOR

PHD (OTAGO), BMEDSC (HONS) (WELL)

Dr Connor leads the Vaccine Alliance Aotearoa New Zealand – Ohu Kaupare Huaketo vaccine evaluation team, tasked with assessing potential vaccine candidates for the ability to stimulate appropriate immune responses against the COVID-19 virus.

DR OLIVIER GASSER

MSC (STRASBOURG), PHD (BASEL)

Dr Gasser leads the translational immunology programme. His research investigates ways to leverage communication between the immune system and metabolism, with an emphasis on nutrition and gut resident microbes, to design new therapies to improve human health.

PROFESSOR IAN HERMANS

BSC (HONS) (OTAGO), MSC (DISTINC) (OTAGO), PHD (WELL)

Professor Hermans is Deputy Director of Research and leads the immunotherapy research programme. The main goal of his research is to design strategies to harness the immune system to eradicate cancer and chronic infections.

PROFESSOR FRANCA RONCHESE

PHD (PADUA), DIP MICROBIOLOGY

Professor Ronchese leads the immune cell biology research programme. The goal of this programme is to identify and classify the unique signals that drive the initiation of allergic immune responses with the goal of finding new opportunities to prevent the development of allergic conditions.

DR ROBERT WEINKOVE

MA (CANTAB), MBBS, PHD, FRACP, FRCPA

Dr Weinkove is Clinical Director, leads the CAR T-cell research programme and is Principal Investigator to the ENABLE CAR T-cell clinical trial. He holds a joint position as a consultant haematologist, working at the Wellington Blood and Cancer Centre and Kenepuru Hospital.

Publications

La Flamme AC, Milling S (2020). Immunological partners: the gut microbiome in homeostasis and disease. **Immunology.** 161(1):1-3

Milling S, La Flamme AC (2020). A joint spotlight on research into the microbial immunity: beyond mere correlations. **Immunol Cell Biol.** 98(8):614-616

Eiholzer RA, Mehta S, Kazantseva M, Drummond CJ, McKinney C, Young K, Slater D, Morten BC, Avery-Kiejda KA, Lasham A, Fleming N, Morrin HR, Reader K, Royds JA, Landmann M, Petrich S, Reddel R, Huschtscha L, Taha A, Hung NA, Slatter TL, Braithwaite AW (2020). Intronic TP53 Polymorphisms Are Associated with Increased Δ133TP53 Transcript, Immune Infiltration and Cancer Risk. **Cancers (Basel).** 12(9):2472

Mehta S, Algie M, Al-Jabry T, McKinney C, Kannan S, Verma CS, Ma W, Zhang J, Bartolec TK, Masamsetti VP, Parker K, Henderson L, Gould ML, Bhatia P, Harfoot R, Chircop M, Kleffmann T, Cohen SB, Woolley AG, Cesare AJ, Braithwaite A (2020). Critical Role for Cold Shock Protein YB-1 in Cytokinesis. **Cancers (Basel).** 12(9):E2473

Al-Sawaf O, Zhang C, Tandon M, Sinha A, Fink AM, Robrecht S, Samoylova O, Liberati AM, Pinilla-Ibarz J, Opat S, Sivcheva L, Le Dû K, Fogliatto LM, Niemann CU, Weinkove R, Robinson S, Kipps TJ, Tausch E, Schary W, Ritgen M, Wendtner CM, Kreuzer KA, Eichhorst B, Stilgenbauer S, Hallek M, Fischer K (2020). Venetoclax plus obinutuzumab versus chlorambucil plus obinutuzumab for previously untreated chronic lymphocytic leukaemia (CLL14): follow-up results from a multicentre, open-label, randomised, phase 3 trial. **Lancet Oncol.** 21(9):1188-1200

Marques CR, Wibowo D, Rubio-Reyes P, Serafim LS, Soares AMVM, Rehm BHA (2020). Bacterially assembled biopolyester nanobeads for removing cadmium from water. **Water Res**. 186:116357

Mayer JU, Brown SL, MacDonald AS, Milling SW (2020). Defined Intestinal Regions Are Drained by Specific Lymph Nodes That Mount Distinct Th1 and Th2 Responses Against Schistosoma mansoni Eggs. **Frontiers in Immunology.** 11:592325

Macartney-Coxson D, Cameron AM, Clapham J, Benton MC (2020). DNA methylation in blood-Potential to provide new insights into cell biology. **PLoS One.** 15(11):e0241367

Hilligan KL, Tang SC, Hyde EJ, Roussel E, Mayer JU, Yang J, Wakelin KA, Schmidt AJ, Connor LM, Sher A, MacDonald AS, Ronchese F (2020). Dermal IRF4+ dendritic cells and monocytes license CD4+ T helper cells to distinct cytokine profiles. **Nat Commun.** 11(1):5637

Jiang Z, Liao R, Lv J, Li S, Zheng D, Qin L, Wu D, Chen S, Long Y, Wu Q, Wang S, Lin S, Huang X, Tang Z, Shi P, Zhou H, Liu Q, Zhao R, Li Y, Jie Y, Wei W, Lai P, Du X, Cui S, Weinkove R, Liu P, Pei D, Yao Y, Li P (2020). IL-6 trans-signaling promotes the expansion and anti-tumor activity of CAR T cells. **Leukemia.** 35(5):1380-1391

Daniels K, Conway A, Gardner R, Martinez L, Price KM, Schneider S, Sheridan R, Srivastava J, Thornton S (2020). Remote Training of SRL User and Staff in a Global Pandemic. **Cytometry A**. 99(1):42-50

Herst PM, Grasso C, Fabre MS, Boukalova S, Ezrova Z, Neuzil J, Berridge MV (2020). A simple indirect colorimetric assay for measuring mitochondrial energy metabolism based on uncoupling sensitivity. **Biochem Biophys Rep.** 24:100858

Grasso C, Eccles DA, Boukalova S, Fabre MS, Dawson RH, Neuzil J, Herst PM, Berridge MV (2020). Mitochondrial DNA Affects the Expression of Nuclear Genes Involved in Immune and Stress Responses in a Breast Cancer Model. **Front Physiol.** 11:543962

Painter GF, Burn OK, Hermans IF (2020). Using agonists for iNKT cells in cancer therapy. **Mol Immunol.** 130:1-6

Burn OK, Prasit KK, Hermans IF (2020). Modulating the Tumour Microenvironment by Intratumoural Injection of Pattern Recognition Receptor Agonists. **Cancers 2020.** 12(12), 3824

You H, Mayer JU, Johnston RL, Sivakumaran H, Ranasinghe S, Rivera V, Kondrashova O, Koufariotis LT, Du X, Driguez P, French JD, Waddell N, Duke MG, Ittiprasert W, Mann VH, Brindley PJ, Jones MK, McManus DP (2021). CRISPR/Cas9-mediated genome editing of Schistosoma mansoni acetylcholinesterase. **FASEB J.** 35(1):e21205

Donovan GH, Gatziolis D, 't Mannetje A, Weinkove R, Fyfe C, Douwes J (2021). An empirical test of the biodiversity hypothesis: Exposure to plant diversity is associated with a reduced risk of childhood acute lymphoblastic leukemia. **Sci Total Environ.** 768:144627

Denny L, Al Abadey A, Robichon K, Templeton N, Prisinzano TE, Kivell BM, La Flamme AC (2021). Nalfurafine reduces neuroinflammation and drives remyelination in models of CNS demyelinating disease. **Clin Transl Immunology**. 10(1):e1234

Koff WC, Schenkelberg T, Williams T, Baric RS, McDermott A, Cameron CM, Cameron MJ, Friemann MB, Neumann G, Kawaoka Y, Kelvin AA, Ross TM, Schultz-Cherry S, Mastro TD, Priddy FH, Moore KA, Ostrowsky JT, Osterholm MT, Goudsmit J (2021). Development and deployment of COVID-19 vaccines for those most vulnerable. **Sci Transl Med**. 13(579):eabd1525

Robichon K, Sondhauss S, Jordan TW, Keyzers RA, Connor B, La Flamme AC (2021). Localisation of clozapine during experimental autoimmune encephalomyelitis and its impact on dopamine and its receptors. **Sci Rep**. 11(1):2966

Geoghegan JL, Moreland NJ, Le Gros G, Ussher JE (2021). New Zealand's science-led response to the SARS-CoV-2 pandemic. **Nat Immunol**. 22(3):262-263

Pellefigues C, Naidoo K, Mehta P, Schmidt AJ, Jagot F, Roussel E, Cait A, Yumnam B, Chappell S, Meijlink K, Camberis M, Jiang JX, Painter G, Filbey K, Uluçkan Ö, Gasser O, Le Gros G (2021). Basophils promote barrier dysfunction and resolution in the atopic skin. **J Allergy Clin Immunol** 48(3), 799-812.e10

La Flamme AC, Abernethy D, Sim D, Goode L, Lockhart M, Bourke D, Milner I, Garrill TM, Joshi P, Watson E, Smyth D, Lance S, Connor B (2021). Safety and acceptability of clozapine and risperidone in progressive multiple sclerosis: a phase I, randomised, blinded, placebo-controlled trial. **BMJ Neurol Open**. 2(1):e000060

Ezrova Z, Nahacka Z, Stursa J, Werner L, Vlcak E, Kralova Viziova P, Berridge MV, Sedlacek R, Zobalova R, Rohlena J, Boukalova S, Neuzil J (2021). SMAD4 loss limits the vulnerability of pancreatic cancer cells to complex I inhibition via promotion of mitophagy. **Oncogene**. 40(14):2539-2552

Ngo TTD, Lea RA, Maksemous N, Eccles DA, Smith RA, Dunn PJ, Thao VC, Ha TMT, Bùi CB, Haupt LM, Scott R, Griffiths LR (2021). The MinION as a cost-effective technology for diagnostic screening of the SCN1A gene in epilepsy patients. **Epilepsy Res**. 172:106593

Pellefigues C, Mehta P, Chappell S, Yumnam B, Old S, Camberis M, Le Gros G (2021). Diverse innate stimuli activate basophils through pathways involving Syk and IκB kinases. **Proc Natl Acad Sci U S A**. 118(12):e2019524118

Sheng J, Chen Q, Wu X, Dong YW, Mayer JU, Zhang J, Wang L, Bai X, Liang T, Sung YH, Goh WWB, Ronchese F, Ruedl C (2021). Fate mapping analysis reveals a novel murine dermal migratory Langerhans-like cell population. **Elife**. 10:e65412

Kiner E, Willie E, Vijaykumar B, Chowdhary K, Schmutz H, Chandler J, Schnell A, Thakore PI, LeGros G, Mostafavi S, Mathis D, Benoist C, Immunological Genome Project Consortium (2021). **Publisher Correction**: Gut $CD4^+$ T cell phenotypes are a continuum molded by microbes, not by $T_H$archetypes. **Nat Immunol**. 22(5):666-668

Lasham A, Knowlton N, Mehta SY, Braithwaite AW, Print CG (2021). Breast Cancer Patient Prognosis Is Determined by the Interplay between TP53 Mutation and Alternative Transcript Expression: Insights from TP53 Long Amplicon Digital PCR Assays. **Cancers (Basel)**. 13(7):1531

Villa M, O'Sullivan D, Pearce EL (2021). Glucose makes T_{reg} lose their temper. **Cancer Cell**. 39(4):460-462

Fu Z, Mowday AM, Smaill JB, Hermans IF, Patterson AV (2021). Tumour Hypoxia-Mediated Immunosuppression: Mechanisms and Therapeutic Approaches to Improve Cancer Immunotherapy. **Cells.** 10(5): 1006

McCaughan G, Di Ciaccio P, Ananda-Rajah M, Gilroy N, MacIntyre R, Teh B, Weinkove R, Curnow J, Szer J, Enjeti AK, Ross DM, Mulligan S, Trotman J, Dickinson M, Quach H, Choi P, Polizzotto MN, Tam CS, Ho PJ, Ku M, Gregory G, Gangatharan S, Hapgood G, Cochrane T, Cheah C, Gibbs S, Wei A, Johnston A, Greenwood M, Prince HM, Latimer M, Berkahn L, Wight J, Armytage T, Hamad N (2021). COVID-19 vaccination in haematology patients: an Australian and New Zealand consensus position statement. **Intern Med J.** 51(5):763-768

Xie L, McKenzie CI, Qu X, Mu Y, Wang Q, Bing N, Naidoo K, Alam MJ, Yu D, Gong F, Ang C, Robert R, Marques FZ, Furlotte N, Hinds D, Gasser O, 23andMe Research Team, Xavier RJ, Mackay CR (2021). pH and Proton Sensor GPR65 Determine Susceptibility to Atopic Dermatitis. **J Immunol.** ji2001363. Epub ahead of print.

Burn OK, Pankhurst TE, Painter GF, Connor LM, Hermans IF (2021). Harnessing NKT cells for vaccination. **Oxford Open Immunology.** iqab013

Sharrock AV, McManaway SP, Rich MH, Mumm JS, Hermans IF, Tercel M, Pruijn FB, Ackerley DF (2021). Engineering the Escherichia coli Nitroreductase NfsA to Create a Flexible Enzyme-Prodrug Activation System. **Front Pharmacol.** 12:701456

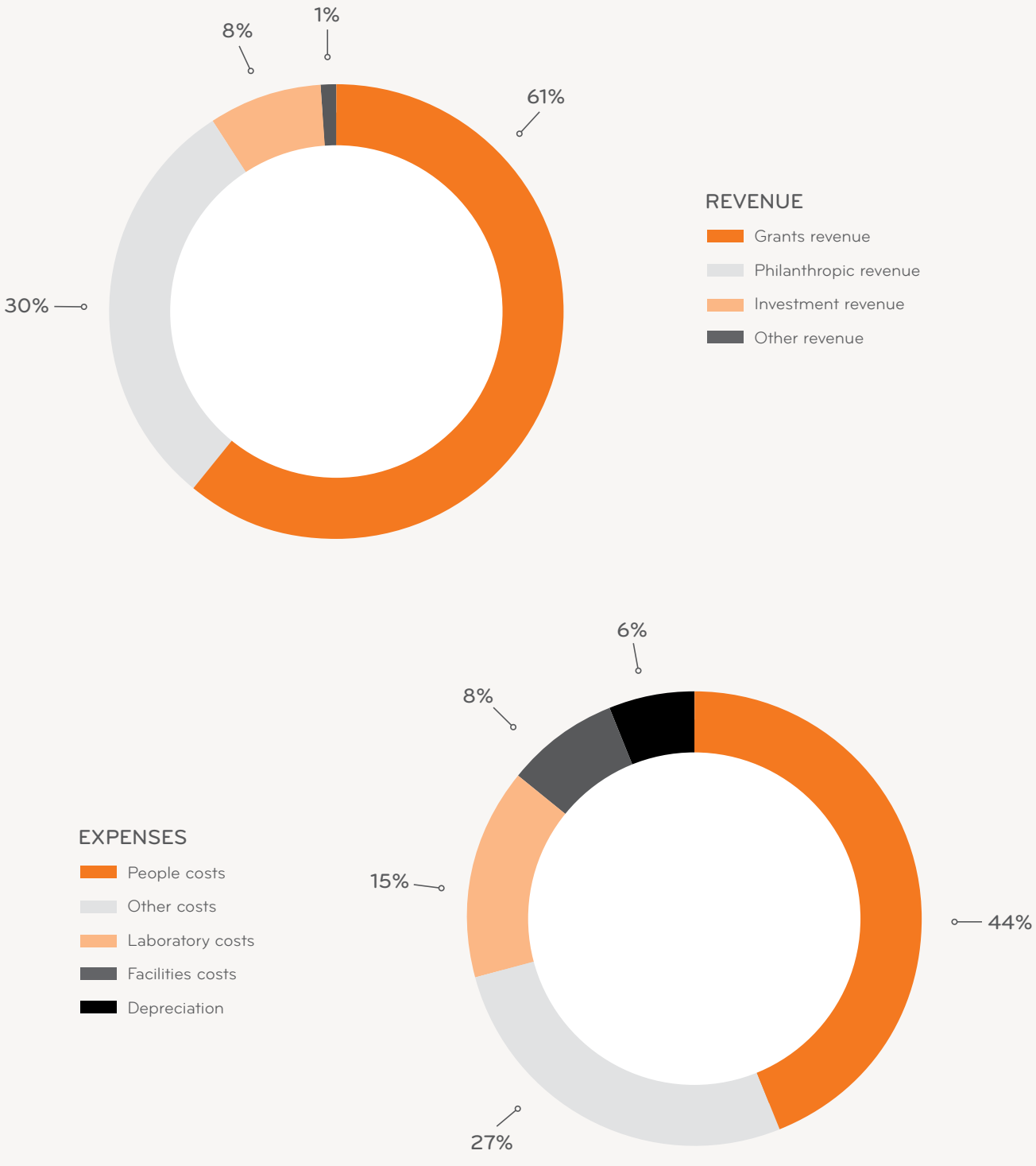
Munoz-Erazo L, Schmidt AJ, Price KM (2021). High-Dimensional Image Analysis using Histocytometry. **Curr Protoc.** 1(6):e184

Naidoo K, Woods K, Pellefigues C, Cait A, O'Sullivan D, Gell K, Marshall AJ, Anderson RJ, Li Y, Schmidt A, Prasit K, Mayer JU, Gestin A, Hermans IF, Painter G, Jacobsen EA, Gasser O (2021). MR1-dependent immune surveillance of the skin contributes to pathogenesis and is a photobiological target of UV light therapy in a mouse model of atopic dermatitis. **Allergy.** 76(10):3155-3170

Gasser O, Tang J, Cait A (2021). Commentary on "properties and reactivity of the folic acid and folate photoproduct 6-formylpterin" by Goossens et al. [Free radic. Biol. Med. (2021) May 6;S0891-5849(21)00283-5]. **Free Radic Biol Med.** 2021 Jul 9:S0891-5849(21)00405-6

Tang JS, Cait A, Li Y, Abolins-Thompson H, Gell K, Herst PM, O'Sullivan D, Gasser O (2021). Practical Approach To Explore the Effects of Polyphenols on Aryl Hydrocarbon Receptor Regulated Immune Function. **J Agric Food Chem**. 2021 Aug 2

Financial overview



FINANCIAL PERFORMANCE

For the year ended 31 July 2021	2021	2020
REVENUE		
Grants revenue	12,676,033	8,919,112
Philanthropic revenue	6,186,344	6,257,478
Investment revenue	1,731,318	633,159
Other revenue	161,719	79,816
	20,755,414	**15,889,564**
EXPENSES		
Depreciation	1,093,807	873,721
Facilities costs	1,573,029	1,236,003
Laboratory costs	2,905,594	2,459,190
Other costs	5,217,401	1,630,225
People costs	8,335,315	7,044,490
	19,125,146	**13,243,629**
SURPLUS/(DEFICIT)	1,630,268	2,645,935
Share of surplus/(deficit) of associate		(58,146)
Impairment of investment in associate		(471,873)
Total comprehensive revenue and expense	**1,630,268**	**2,115,916**

FINANCIAL POSITION

As at 31 July	2021	2020
	Consolidated	Consolidated
ASSETS		
Current assets	23,358,238	19,015,280
Non-current assets	8,719,667	7,686,395
	32,077,905	**26,701,675**
LIABILITIES		
Current liabilities	7,134,456	3,388,493
	7,134,456	**3,388,493**
NET ASSETS	**24,943,449**	**23,313,181**

Thank you for your support

The passion of our supporters constantly propels the Institute towards bigger and better things. The Development team are here to make the most of this support so our scientists can keep making life-saving scientific breakthroughs.

Since joining the Institute in November 2020 I've had the pleasure of getting to know a number of our incredible supporters across New Zealand. Every day I feel privileged to be able to work for an organisation dedicated to solving such significant health problems using new and innovative immunological approaches. Seeing the dedication of our scientists reflected in the unwavering support of our donors is very powerful.

COVID-19 has challenged many different sectors, not least the philanthropic one. Many more traditional fundraising activities simply have not been able to take place under different alert levels. The financial knock-on effect of the pandemic on global markets has also affected many larger funders, but despite this, we've raised more than $6 million over the last year thanks to the unwavering generosity of our supporters.

I want to thank our Friends of the Malaghan Institute groups across the country for their loyal support in the face of a hard year for events. I had the fortune of attending successful golf events across the country and getting to know the wonderful Friends. We are lucky to have such motivated advocates for the organisation and I look forward to seeing what the year ahead brings.

There are so many people who have made our work possible over the years. This year we celebrated 10 years of support from both the Hugh Green Foundation and the Thompson Family Foundation. Both of these organisations have been instrumental in our growth and are part of the fabric of the Malaghan Institute. We are thankful to have the support of great partners such as Freemasons New Zealand as well as many individuals whose contributions enable our researchers to continue working hard to find new treatments.

It's important to acknowledge every single person who donates to the Institute. Truly, it is your generosity, no matter how small or large your gift, that keeps us here and working for the health of Aotearoa.

Thank you,

Laura Golland | HEAD OF DEVELOPMENT

All support, big and small, holds a special place in our hearts at the Malaghan Institute.

We would like to say a special thank you to:

BEA Trust
Bolton Hotel
Colin Williamson Charitable Trust
Dairy Goat Co-Operative (NZ) Ltd
The David Levene Foundation
The Dines Family Charitable Trust
EM Pharazyn Charitable Trust
FH Muter Charitable Trust
Four Winds Foundation
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Lexus of Wellington
LifeBlood Trust (Formerly Florence Petersen Leukaemia Trust)
The Lion Foundation
The Margaret Ann Tibbles Charitable Trust
The Dr Marjorie Barclay Charitable Trust
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Ministry of Business, Innovation & Employment
New Zealand Community Trust
Nikau Foundation
The Paddy Brow Charitable Trust
Pelorus Trust
Estate of Peter Burgess
Research for Life
Rex & Betty Coker Foundation
Rotary Club of Port Nicholson
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Zephyr

Bay of Plenty Friends of the Malaghan Institute
Hawke's Bay Friends of the Malaghan Institute
Taupō Friends of the Malaghan Institute
Wellington Friends of the Malaghan Institute

Trust Board

MR GRAHAM MALAGHAN

ONZM, HON. DSC (VUW), FCILT (CHAIRMAN)

Graham was appointed Chairman of the Trust Board in 1990. He was first employed at General Foods Corp in 1967, and was appointed General Manager of Refrigerated Freight Lines in 1970, acquiring the company in 1987. Graham was founding Chairman of Tasman Express Line and a member of the Land Transport Safety Authority for six years. In 2009 he was awarded an Honorary Doctorate of Science from Victoria University of Wellington for his key role in rebuilding the Malaghan Institute into the largest independent medical research organisation in New Zealand. Recipient of the Sir Bob Owens Award in 2010 for contributions to the transport, logistics industries and the community, Graham was made an Officer of the Order of Merit for his services to medical research and philanthropy in 2012. His current directorships include several private companies.

PROFESSOR GRAHAM LE GROS

CNZM, FRSNZ, FRCPA (HON), BSC (MASSEY), DIP IMMUNOL (OTAGO), MPHIL, PHD (AUCKLAND) (DIRECTOR)

Graham was appointed to the Trust Board in 1995. Awarded a Fogarty Fellowship at the National Institutes of Health, Washington DC from 1987–1989, Graham then took a scientist position with Ciba-Geigy in Basel, Switzerland for five years before returning to New Zealand to take up the position of Research Director of the Malaghan Institute in 1994. Graham is a Professor of the School of Biological Sciences, Victoria University of Wellington. A Fellow of the Royal Society of New Zealand, in 2014 he was made a Companion of the New Zealand Order of Merit for his services to medical research.

MR JOHN BEATTIE

LLB, MAICD (VUW)

John was appointed to the Trust Board in 1991. He is a director of Malcorp Biodiscoveries Limited, a subsidiary of the Malaghan Institute, and a director of Wellington Zhaotai Therapies Ltd. After obtaining a law degree from Victoria University of Wellington in 1975, John was a Fulbright Scholar to Cornell University in 1979. He is a governor of the NZ Sports Hall of Fame. John has been a partner in national law firm Kensington Swan, a General Manager of Brierley Investments Limited and was the co-founder of Genesis Research and Development Corporation Limited with the late Professor Jim Watson, a former Trustee of the Malaghan Institute.

MR TIM BENNETT

MBA, BCOM

Tim was appointed to the Trust Board in 2019. Tim is an experienced senior executive and strategic advisor with extensive experience in the capital, commodity and financial markets in New Zealand, the United States, Australia and Asia. His executive roles have included Chief Executive Officer of NZX from 2012–2017, and a Partner of Oliver Wyman and the Boston Consulting Group. He is a director of Partners Life, AIX and Avalia Immunotherapies.

DR MAIA BREWERTON

MBCHB, FRACP, FRCPA

Maia was appointed to the Trust Board in 2021. She is a clinical immunologist, allergist and immunopathologist. Maia works as a medical specialist at Auckland Hospital and heads the immunology laboratory at North Shore Hospital. She is also a Research Consultant at the Malaghan Institute. She has sat on the Māori Health Committee of the Royal Australasian College of Physicians (RACP) as well as the RACP Adult Medicine Division Committee. She is the chair of the New Zealand Clinical Immunology and Allergy Group. In partnership with the Australian Clinical Immunology & Allergy Society and Allergy New Zealand, Maia has set her sights on developing a National Allergy Strategy for Aotearoa with a strong equity lens.

SIR PAUL COLLINS

KNZM, BCA, ACA

Sir Paul was appointed to the Trust Board in 2019. He also currently chairs the Wairarapa District Health Board and Active Equity Holdings Limited, and is a director of the Hurricanes Limited, Shott Beverages Limited, NZ Health Partnerships Ltd, and Central Region's Technical Advisory Services Ltd. The former Chief Executive of Brierley Investments has served on the board of more than 50 listed companies globally and extensively in sports governance, including as Chairman of Sport New Zealand and High Performance Sport New Zealand Limited. He is an Associate Chartered Accountant and holds a bachelor's degree in Commerce and Administration from Victoria University of Wellington. In 2015, he was made a Knight Companion of the New Zealand Order of Merit for services to sports governance.

PROFESSOR DAVE HARPER

BA (HONS) (OTAGO), MA, PHD (CANT)

Dave was appointed to the Trust Board in 2019. He came to Te Herenga Waka – Victoria University of Wellington in 1994 as a lecturer in Psychology and was promoted to professor in 2013. He was head of the School of Psychology between 2006 and 2010, Deputy Dean of the Faculty of Science between 2012 and 2014, appointed Dean of Science in 2014, and Acting Pro-Vice Chancellor of the Faculties of Science, Engineering, Architecture and Design Innovation in 2019. Since 2021, Dave has been the Deputy Pro-Vice Chancellor of the Division of Science, Health, Engineering, Architecture and Design Innovation with a role focusing on strategic project development. Dave's research interests include the comparison of learning processes across animal species, laboratory analogues to study attention and decision making, the impact of drugs of abuse on cognition, and the comparative roles played by the brain's neurochemical systems, serotonin, and dopamine in memory function.

PROFESSOR PARRY GUILFORD

MSC (OTAGO), PHD (CU), FRSNZ

Parry was appointed to the Trust Board in 2019. Parry is Director of the Cancer Genetics Laboratory and the Centre for Translational Cancer Research (Te Aho Matatū) at the University of Otago. He is a co-founder of the publicly listed biotechnology company Pacific Edge Ltd, and a Deputy Director of the Healthier Lives National Science Challenge. His current research interests include the genetics of inherited and sporadic cancers, in particular stomach cancer. Other active research areas are the development of genomic-based diagnostic tools for early cancer detection and personalised medicine.

DR DIANNE C MCCARTHY

CNZM, CRSNZ, BA, BSC, MSC (HONS), PHD (AUCK)

Dianne was appointed to the Trust Board in 2015. Dianne was Chief Executive of the Royal Society of New Zealand from 2007–2014, and has more than 25 years' experience in various senior management and governance roles in the tertiary education, science and health sectors. She is Pro-Chancellor of Victoria University of Wellington Te Herenga Waka, Deputy Chair of the Board of the New Zealand Institute of Economic Research, a director of the Bragato Research Institute, a member of the governance group of the Dodd-Walls Centre for Photonic and Quantum Technologies, and a trustee of the Hearing Research Foundation (NZ). Dianne was made an Officer of the New Zealand Order of Merit for services to education in 2008, a Companion of the Royal Society of New Zealand for services to science in 2015, and a Companion of the New Zealand Order of Merit for services to science, business and women in 2016.

MR TONY MOSSMAN

BBS, DIP BUS STUD, CA, CMINSTD

Tony was appointed to the Trust Board in December 2019. He has been a Chartered Accountant in public practice in the Hawke's Bay region for more than 20 years after spending time in banking in both London and Wellington. Tony was Deputy Chair of Lotto NZ, and has been a trustee of the Hawke's Bay Helicopter Rescue Trust and Iona College Board of Proprietors. He holds a Business Studies degree and diploma from Massey University and is a Chartered Accountant and Chartered Member of the New Zealand Institute of Directors. He also continues to be involved with family interests in agriculture and forestry.

MS NICOLA SLADDEN

LLB (WELL), MPH (BU)

Nicola was appointed to the Trust Board in July 2014. Nicola was appointed Banking Ombudsman in 2015 after four and a half years as Deputy Banking Ombudsman. She is a consultant for the World Bank, and has more than 20 years' experience in dispute resolution, a law degree from Victoria University of Wellington and a Master of Public Health from Boston University. Nicola was previously the Chief Legal Advisor at the Office of the Health and Disability Commissioner and has worked in private practice. She has published and presented on dispute resolution in New Zealand and abroad.

DR MICHELLE SULLIVAN

BSC (HONS) (OTAGO), PHD (MASSEY)

Michelle was appointed to the Trust Board in 2021. Michelle is currently CEO of Unicorn Foundation, New Zealand's national charity supporting neuroendocrine cancer patients, and is also the General Manager of Cancer Research Trust NZ. She is the former Board Chair at Middlemore Clinical Trials, founding CEO of the advocacy alliance New Zealanders for Health Research, and the former CEO at NZBIO, New Zealand's Bioscience Industry Association. Michelle is also the founder and director of bioscience consulting firm Electric Sheep Ltd and has undertaken a range of diverse consulting projects within the public and private sectors. Prior to appointment to the Trust Board, Michelle chaired the Strategic Alliance board for the Malaghan Institute's CAR T-cell cancer immunotherapy partnership. Michelle holds a PhD in protein biochemistry from Massey University and an Honours degree in Biochemistry from the University of Otago.

ASSOCIATE PROFESSOR JOHN CARTER

Trustee, friend, mentor and collaborator

It is with great sadness that we farewell Associate Professor John Carter MNZM, Trustee and long-time collaborator and supporter of the Malaghan Institute, who died on 2 June 2021, surrounded by his family.

In his role as head of the Wellington Blood and Cancer Centre, John was an early ally in the Institute's first cancer immunotherapy trials in the late 1990s and remained a close friend and colleague since, helping guide the Institute in transforming its research into the clinic. In 2003 he was appointed to the Institute's Trust Board and was recently appointed Deputy Chair.

Malaghan Institute Clinical Director and fellow haematologist Dr Rob Weinkove said that as well as being a deeply committed and relentlessly cheerful clinician, John was an enthusiastic supporter of research and teaching.

"John was instrumental in building the clinical haematology service in Wellington, particularly the bone marrow transplantation service. This, as well as his encouragement of research, helped to bring the very first cellular therapy trials to the Malaghan Institute. He remained a keen supporter of our research for decades, and was campaigning on behalf of the CAR T-cell programme in recent weeks. His commitment to patients, enthusiasm for research, dedication to teaching and development, laconic humour, and sage advice will be greatly missed."

Deputy Director and Cancer Immunotherapy Programme Leader Professor Ian Hermans said he'll always remember John's erudition.

"When asked to comment on anything, his responses were always well considered, clear, and always, always, respectful. There was also the endless enthusiasm – and the grin. It was only with John's energy and expert guidance that we conducted our first clinical trials. When we had issues, I'd often seek out John for advice. Those discussions always ended with a clear plan and a new sense of optimism. I'm sure many of us at the Institute have similar memories. He was a mentor to many – we'll miss him a lot."

Te Urungi Māori

DR CLIVE ASPIN

PHD (OTAGO), MA (WELL), BA, DIPELT, DIP TCHG
Ngāti Maru, Ngāti Whanaunga, Ngāti Tamaterā

Clive is the inaugural Associate Dean Māori in the Faculty of Health at Te Herenga Waka – Victoria University of Wellington where he is also a Senior Lecturer in Health and Postgraduate Studies Director. He was born in Waiuku and grew up on his ancestral land of Hauraki. Clive is a Māori public health researcher whose work focuses on Māori and Indigenous health, HIV, sexuality, and suicide prevention. He was the Executive Research Officer at Ngā Pae o te Māramatanga, New Zealand's centre of Māori research excellence. He served as a ministerial appointment to the Board of the Health Research Council and as Chair of the Māori Research Committee and is a founding member of the International Indigenous Working Group on HIV and AIDS.

DR AMOHIA BOULTON

PHD (MASSEY), MA (APPLIED), BA (HONS), BA
Ngāti Ranginui, Ngāi te Rangi, Ngāti Pukenga, Ngāti Mutunga, Te Ati Awa o te Waka a Maui

Amohia is the Director of Whakauae Research Services, a tribally-owned, Indigenous health research centre in Whanganui. She also holds adjunct positions at the Health Services Research Centre, Victoria University of Wellington and in the Faculty of Health and Environmental Sciences at Auckland University of Technology. Amohia is a member of the Healthier Lives, He Oranga Hauora National Science Challenge Governance Group and Kāhui Māori; a Board member of Te Kotahi Research Centre, University of Waikato; and a Technical Advisor to the National Iwi Chairs' Forum.

DR MAIA BREWERTON

MBCHB, FRACP, FRCPA
Ngāti Porou, Ngāti Kahungunu

Maia is a clinical immunologist, allergist and immunopathologist. She works as a medical specialist at Auckland Hospital and heads the immunology laboratory at North Shore Hospital. She is also a Trustee and Research Consultant at the Malaghan Institute. She has sat on the Māori Health Committee of the Royal Australasian College of Physicians (RACP) as well as the RACP Adult Medicine Division Committee. She is the chair of the New Zealand Clinical Immunology and Allergy Group. In partnership with the Australian Clinical Immunology & Allergy Society and Allergy New Zealand, Maia has set her sights on developing a National Allergy Strategy for Aotearoa with a strong equity lens.

DR LIS ELLISON-LOSCHMANN

PHD (MASSEY)
Te Ātiawa, Ngāi Tahu, Ngāti Toa Rangatira, Ngāti Raukawa

Lis is an epidemiologist with expertise in the areas of health inequities, access to care, chronic disease – specifically cancer and respiratory conditions – and health system performance. She also has a wider focus on Māori and Pasifika research/health development particularly in relation to primary health care and the significant contribution that Māori and Pasifika provider organisations make to population health and health service provision in Aotearoa New Zealand.

DR RUAKERE HOND

PHD (MASSEY), MMS (AWANUIARANGI)
Taranaki, Ngāti Ruanui, Te Whānau-ā-Apanui

Ruakere is prominent in reo revitalisation initiatives with a particular focus on projects in Taranaki. After completing a Bachelor of Science at Waikato University, he shifted to teaching and has spent the last 30 years in Māori language acquisition through immersion with an emphasis on community learning and using Te Ataarangi – The Silent Way approach. His doctoral research explored Māori language revitalisation as a key element of Māori health promotion. Ruakere is a current Waitangi Tribunal member and has held governance roles in Te Taura Whiri i te Reo Māori – the Māori Language Commission and Te Mātāwai, the national community Māori language board.

DR WILLY-JOHN MARTIN

PHD (WELL), MSC, BSC
Ngāti Wai, Ngāti Whātua, Ngāti Tamaterā, Ngāti Porou

Willy-John is dedicated to actualising Māori aspirations in science. He is the inaugural Pou Pūtaiao/Director, Māori Research, Science and Innovation at the Ministry of Business, Innovation and Employment. He was previously the Manager Vision Mātauranga and Capacity Development at the Science for Technological Innovation National Science Challenge, and was founding deputy chair of Rauika Māngai. Formerly a biomedical researcher, he is a PhD Alumnus of the Malaghan Institute. In Melbourne, he established the Walter and Eliza Hall Institute's first Indigenous research initiative in its 100-year history, and was a founding member of its institute-wide cultural competency programmes. In 2020, he received Te Mātanga Ora Award from his iwi, Ngāti Whātua Ōrākei.

LEIGH POTTER

PGDIP HSC, NDMDI
Ngāti Porou, Ngāti Kahungunu, Rongomaiwahine, Rongowhakaata

Leigh is the Chief Operations Officer of Mātai, a not-for-profit medical research institute based in Tairāwhiti. She has more than 23 years' experience in radiology clinical practice. Leigh is an experienced imaging technologist – one of the few Māori imaging technologists in the world – and has significant leadership experience. She has an interest in supporting innovative research programmes which have strong translation into clinical practice for improving patient outcomes, especially for Māori. Leigh is a representative of the Mātai Māori Advisory Board and the National Radiology Advisory Board.

Staff directory

BOARD OF TRUSTEES

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Mr Gary Quirke | BCA, CA, FCILTZ

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Dr Amohia Boulton | PhD (Massey), MA (Applied), BA (Hons), BA Ngāti Ranginui, Ngāi te Rangi, Ngāti Pukenga, Ngāti Mutunga, Te Ati Awa ki te Waka a Maui

Dr Maia Brewerton | MBChB, FRACP, FRCPA Ngāti Porou, Ngāti Kahungunu

Dr Lis Ellison-Loschmann | PhD (Massey) Te Ātiawa, Ngāi Tahu, Ngāti Toa Rangatira, Ngāti Raukawa

Dr Ruakere Hond | PhD (Massey), MMS (Awanuiarangi) Taranaki, Ngāti Ruanui, Te Whānau-ā-Apanui

Dr Willy-John Martin | PhD (Well), MSc, BSc Ngāti Wai, Ngāti Whātua, Ngāti Tamaterā, Ngāti Porou

Leigh Potter | PgDip HSC, NDMDI Ngāti Porou, Ngāti Kahungunu, Rongoamaiwahine

DIRECTOR CHIEF EXECUTIVE

Prof Graham Le Gros | CNZM, FRSNZ, FRCPA (Hon), BSc (Massey), Dip Immunol (Otago), MPhil, PhD (Auckland)

GENERAL MANAGER

Mike Zablocki | BA (Hons) (Bristol), PGDipBA (Well)

DEPUTY DIRECTORS

Prof Ian Hermans | BSc (Hons) (Otago), MSc (Distinc) (Otago), PhD (Well) – Hugh Dudley Morgans Fellow

Prof Franca Ronchese | PhD (Padua), Dip Microbiology

Dr Robert Weinkove | MA (Cantab), MBBS (Hons), PhD, FRACP, FRCP – Wade Thompson Clinical Research Fellow

SENIOR SCIENTISTS

Prof Mike Berridge | BSc, MSc (Hons), PhD (Auckland) (Distinguished Research Fellow)

Dr Olivier Gasser | MSc (Strasbourg), PhD (Basel)

Dr Rachel Perret | BSc

Dr Frances Priddy |MD, MPH, FACP (Hons), PhD

SENIOR STAFF

Marie Armstrong | BAP, PGDipIM (Well) – Head of IT

Bethany Andrews | BMus (Hons) (Cardiff) - GMP Manager / VAANZ Programme Manager

Mali Camberis | BSc (Well), PGCertMS (Well) – Head of Laboratories

Dr Neil Domigan | PhD, MBA - Commercialisation Manager: Cell Therapies

Laura Golland | BA (Hons) (Leeds) – Head of Development

David Lin | CA (NZICA), MBA (Well), MAF (Well) – Head of Finance

Gail Marshall | BA (NZICA), GDip (Well) – Head of Communications (part-time)

Heike Menne-Spohr | MCom (Well), BCom (Hons) (UNISA) – Head of HR and Research Office

Kylie Price | BSc (Otago), MSc (Hons) (Well) – Head of Research Technology

Ian Saldanha | BSc, PGDipSci (Otago), DipVetNursing (Otago Polytechnic) – Head of Biological Research Unit

Darrell Smith | GCertBMgt (Well), GDipBMgt (Well), BSc (Hons) (Well), MSc (Well), GDipOHS (Massey), BAppSc (Massey), BB (Kyokushinkaikan) – Head of Facilities

SCIENCE STAFF

Helena Abolins-Thompson | BBiomedSc (Hons) (Well) – Summer Student (to February 2021)

Reigh Aguinaldo | MSc – Animal Technologist

Astrid Authier-Hall | BSc, MSc (Massey) – Senior Research Officer (part-time)

Arie Bates-Hermans | Data Entry Administrator (Casual) (to June 2021)

Hannah Boswell | BBiomedSc (Hons) (Otago) – PhD Student

Caitlin Brown | BSc (Well) – Animal Technologist

Prof Antony Braithwaite | BSc, MSc (Auck), PhD (ANU) – Visiting Researcher

Dr Olivia Burn | BSc (Hons) (Otago), PhD (Otago) – Postdoctoral Research Fellow

Dr Alissa Cait | BSc, PhD (Canada) – Postdoctoral Research Fellow: Mucosal Immunology and Microbiome

Dr Georgia Carson | BSc (Hons) (Well), MSc (Well) – Postdoctoral Research Fellow

Jodie Chandler | BBiomedSc (Hons) (Well) – PhD Student

Morgan Craven | BRU Technician (Casual)

Sally Chappell | BSc (Hons) (Liverpool) – Senior Staff Scientist (Cell Sorting Specialist) (to April 2021)

Dr Nathaniel Dasyam | BBiomedSc, PhD (Well), Rotary Club of Port Nicholson Ian Paterson Fellow – Postdoctoral Research Fellow

Rebecca Dawson | BSc (Hons) (Otago) – PhD Student (to May 2021)

Regina Duffield | BBiomedSc (Melb) – GMP Production Technician

Brian Duffy | BSc, GDipSc, PGCertSc (Well) – Technical Cleaner

Dr David Eccles | BbmedSc (Hons) (Well), BSc (Well), PhD (Well) – Staff Scientist: Bioinformatics Analyst

Julia Eloff | BSc (UNISA), GDipSc (Well), MSc (SUN) – Animal Technician (Animal Welfare Specialist)

Marie-Sophie Fabre | BASc (UPS), BSc (UPMC), MSc Biotech (UDS) – Senior Research Officer

Kathryn Farrand | MSc (Massey) – Senior Research Officer (part-time)

Sophie Faulkner | BBiomedSc, MClinIm (Well) – Research Officer

Dr Laura Ferrer-Font | BSc, MSc, PhD (Barcelona) – Deputy Manager (HGCC)

Lewis Forsyth | BSc (Otago) – Animal Technician (Genetic Quality Specialist)

Dr Regan Fu | BSc, MSc, PhD (Auckland) – Postdoctoral Research Fellow

Robert Fyfe | MB (ChB) – Clinical Fellow

Katie Gell | BBiomedSc, MClinIm (Well) – Research Officer

Dr Philip George | BSc (Hons) (Bristol), MSc, MBChB (Warwick), MRCP (London) and FRCPATH – Clinical Fellow: CAR T-Cell (to June 2021)

Dr Connie Gilfillan | PhD – Senior Research Officer (to June 2021)

Dr Giulia Giunti | PhD (King's College), MSc (University of Milano-Bicocca), BSc (Milano Bicocca) – Quality Manager (part-time)

Alix Grooby | Research Officer (Casual)

Tia Huia Haira | BBiomedSc (Well) – Research Officer (Tissue Bank Manager)

Amber Harris-Little | BSc (Well) – Animal Technologist (Animal Welfare Specialist)

Assoc Prof Patries Herst | PhD, MPhil, MSc – Senior Research Fellow (part-time)

James Hedley | Cert Travel & Tourism – Animal Technician (to February 2021)

Dr Kerry Hilligan | BBiomedSc, MBMedSc (Hons) (Well), PhD (Otago) – International Research Fellow (to May 2021)

Amey Hughes | BRU Technician (Casual)

Evelyn Hyde | MSc (Otago) – Senior Research Officer

James Irvine | Animal Technician (part-time)

Ellie-May Jarvis | BBiomedSc (Hons) (Otago) – PhD Student

Jaskirat Kaur | MSc (Punjabi) – Animal Technician, Casual Administration (to October 2020)

Brittany Koning | BSc (Massey), DVN (Wintec) – Animal Technician (Surgical Techniques Specialist)

Dr Olivier Lamiable | PhD (Orleans) – Senior Research Fellow

Abbie Larson | BBiomedSc (Hons) (Otago) – Research Officer

Brittany Lewer | BBiomedSc, MBmedSc (Well) – Research Officer, VAANZ Clinical Programme Manager

Yanyan Li | MBmedSc (Immunol) (Well), PGDip Biomed Science, BBiot, Shanghai Fisheries University – Research Officer

Kate Maclean | BMLSc (Otago), GDipArts (Massey) – Research Officer

Tafeuni Mafile'o | BBiomedSc (Well) – Animal Technician (Biosafety)

Ngarangi Mason | BSc (Hons) (Otago) – Research Officer

John Mamum | BBiomedSc (Well) – MSc Student

Dr Johannes Mayer | BSc, MRes, PhD (Glasgow) – Postdoctoral Research Fellow (to July 2021)

Dr Brigitta Mester | MSc (Hungary), PhD (Well) – GMP Production Manager

Dr Jordan Minnell | MSc, PhD – Postdoctoral Research Fellow

Anna Mooney | BBiomedSc, MBiomedSc (Well) – Research Officer (to December 2020)

Carla Morelli | Dip (Arts) – Animal Technician (Biosecurity)

Cynthia Morgan | BBiomedSc (Well) – Research Officer / Staff Scientist

Dr Tom Mules | Clinical Consultant (part-time)

Dr Luis Munoz-Erazo | BSc, MSc, MPhil, PhD (USyd) – Postdoctoral Research Fellow, Staff Scientist (High Dimensional Imaging Analysis Specialist)

Sophia-Louise Noble | BSc (Hons) (Well) – PhD Student

Yasmin Nouri | BBiomedSc (Well), MSc (Otago) – PhD student

Felix O'Hagen | BBiomedSc (Hons) (Well) – Research Officer

Dr David O'Sullivan | BA, BSc (Otago), BSc (Hons) (Well), PhD (Well) – Senior Postdoctoral Research Fellow

Sam Old | BSc (Otago), MSc (Bioinformatics) (Melb) – Bioinformatics Research Officer

Tess Ostapowicz | Research Nurse

Olga Palmer | BBiomedSc, MBiomedSc (Well) – Research Officer

Dr Theresa Pankhurst | PhD – Postdoctoral Research Fellow

Melanie Prout | BSc (Hons) (Well) – Senior Research Officer

Casper Rifkov | Lab Assistant (Casual)

Dr Patricia Rubio-Reyes | BSc (Hons) (University of Havana), PhD (Massey) – Postdoctoral Research Fellow

Alfonso Schmidt | BSc (Chile) – Senior Staff Scientist (Bioimaging Specialist)

Jordan Selby | Animal Technician (to June 2021)

Saumitra Shaligram | Practicum Student

Sonali Sharma | BSc (Hons) (HPU), MSc (SUBMS) – Deputy BRU Manager

Samantha Small | BBiomedSc, MClinIm (Well) – Senior Staff Scientist (Cell Sorting Specialist)

Adam Stewart | BSc (Well) – BRU Deputy Manager, Business Analyst (to April 2021)

Ching Wen Tang | MSc (Otago) – Senior Research Officer

Shiau-Choot Tang | Grad Dip Sci (Well) – Senior Research Officer (Hazardous Substances Manager)

Dr Jeffry Tang | PhD (Auckland) – Postdoctoral Research Fellow

Tama Te Kawa | BSc (Well) – Research Officer

Mariana Traslosheros Reyes | Summer Student

Eriuti Tanirau | Technical Cleaner (BRU) (to October 2020)

Germaine Uys | BSc – Animal Technician

Dr Francesco Vacca | BSc (Cagliari), MSc (Edinburgh), PhD (Edinburgh) – Postdoctoral Research Fellow

Hannah Van Der Woude | BSc (Waikato), BBioMedSc (Hons) – Visiting Researcher (to February 2021)

Sventja von Daake | MSc – Staff Scientist: Cytomics Specialist

Kirsty Wakelin | BBiomedSc (Hons) (Otago) – GMP Production Technician

Xiaodong Wang | Dip Med Tech, Dip Midwifery (Shanxi) – Senior Animal Technician

Greta Webb | BSc (Auck), BBiomedSc (Hons) (Auck) – PhD student

Michael Wilson | BBiomedSc (Otago), BBiomedSc (Hons) (Well) – Hons Student, Research Officer (to February 2021)

Jarem Wylie | BSc – PhD Student

Dr Jianping (Mark) Yang | BM (Shanxi) – Senior Research Officer (Regulatory Affairs Manager)

Bibek Yumnam | MSc (Tezpur, India), PhD (Wildlife Institute of India) – Research Officer

SUPPORT AND ADMINISTRATION

Michelle Anderson-Sykes | Receptionist and Procurement Coordinator

Jessica Bland | BA – Individual Giving Specialist

Hamish Cameron | BSc (Tech) Biotech (Waikato) – Science Communicator

Robbie Carmichael | BDI (Well), Dip Dig Film (SAE) – Research Office Administrator and Training Administrator (part-time)

Lee Chappell | Office and Procurement Coordinator (to May 2021)

Bethany Chesser | Fundraising Administrator (to March 2021)

Sally Culbert | BBS – Finance (Massey) – Management Accountant (part-time)

Tim Dallas | AFMANZ – Deputy Facilities Manager

Lesleigh Dunn | BVA, PGDipVA (Otago Polytechnic) – Supporter Experience Administrator

Kira Garbe | BSc, MSc (MolBiotech) (Heidelberg) – Business Development Officer (to November 2020)

Oliver Jarvis | BSc (Well), MPE (Well) – Business Development Officer, Programme Manager (VAANZ)

Hannah Johnstone | BPsych (Hons) (JCU) – HR Administrator

Emma Morris | BSc (Auck) – Health and Safety Coordinator

Noriko Murakami | BA (Tokyo) – Grants and Supporter Experience Manager

Nicola Olson | CA (NZICA), BCA (Well), BA (Well) – Financial Accountant (part-time)

Pat Paiti | BA, BCA (Well) – IT Support Technician (to July 2021)

Lene Petersen | Accounts Payable (part-time)

Ilse Potes Morales | BMktg & Advertising (U San Martin) – EA to Director, General Manager and Clinical Director

Megan Riley | BA (Psych) – Fundraising Events and Engagement Advisor

Alex Roberts-Bristow | IT Support Technician

Gaia Smith | General Duties (casual)

Kayne Smith | Facilities Assistant (casual) (to July 2021)

Maria Thomas | BSc (Hons) (Dundee) – Communications Intern

Jo Timewell | Facilities Assistant

Apii Ulberg | Cleaner

Jesse Zhou | BCS (China) – Systems Administrator (to May 2021)

RESEARCH AND CLINICAL CONSULTANTS

Prof Bob Anderson | MBChB, BMedSc, PhD, FRACP, AGAF

Dr Russell Barker | MBBS (London), FRACP, FRCPA

Dr Scott Barker | MBChB, MRCP (UK), FRACP

Dr Maia Brewerton | MBChB, FRACP, FRCPA

Prof Richard Beasley | MBChB, FRACP, DM (Southampton), FAAAAI, FRCP (London), DSc (Otago), FFOM (Hon)

Prof Davide Comoletti | DVM, PhD

Dr Lisa Connor | PhD (Otago), BMedSc (Hons) (Well)

Dr John Croese

Prof Brett Delahunt | ONZM, KStJ, GCLJ, BSc (Hons), MB, ChB, BMedSc, MD, FRSNZ, FRCPA, FFSc (RCPA), FRCPath, FNZSP, AFNZIM

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Dr Elizabeth Forbes-Blom | PhD

Assoc Prof Rebecca Grainger | MBChB (Dstn), BMedSci (Dstn) MIsntD, CHIA, FRACP, FACHI, PhD

Assoc Prof Andrew Harrison | MBChB (Otago), FRACP

Dr Sue Huang | PhD

Dr Stephen Inns | MBChB (Otago), MD (RES.LOND.), FRACP

Prof Alex McLellan | BSc, MSc (Canterbury), PhD (Otago)

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OF MEDICAL RESEARCH

info@malaghan.org.nz
www.malaghan.org.nz
+64 4 499 6914

MalaghanInstitute
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Charity Reg: CC10357

Victoria University
Gate 7, Kelburn Pde
PO Box 7060
Wellington 6242
New Zealand