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MALAGHAN
INSTITUTE
OF MEDICAL RESEARCH

**ANNUAL
REPORT**

2024

Tūramarama ki whēuriuri.

Māramarama ki whēkerekere.

Ka ahoaho ki whea? Hei anei!

Koia.

All darkness given light.

Things unknown can be understood.

The light can be found where? It is here!

It is.

Our karakia, 'E ara' (Rise up), was written and gifted to us by Dr Ruakere Hond.
The full version is available on our website at malaghan.org.nz

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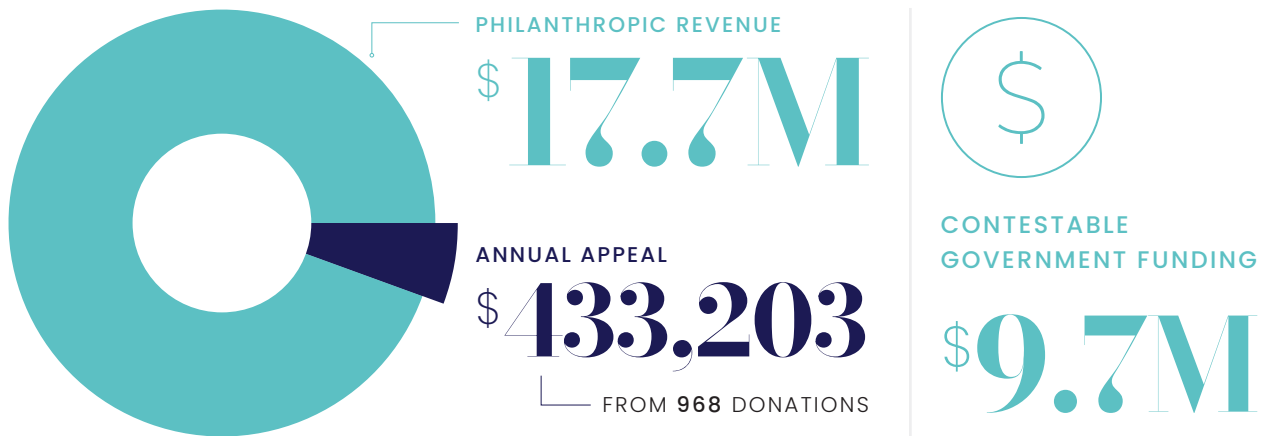
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TE URUNGI MĀORI

Year in review



50

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12

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1,540

new donors

76

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8

visiting speakers

18,052

new subscribers to our news and updates

CAR T-cell therapy clinical trial moves into

PHASE TWO

"I'm amazed to be alive. I wake up every morning and think: 'I'm well'. I wasn't well for three years and then CAR T treatment worked and I'm OK. It's miracle science, just astonishing."



MICHELE LEGGOTT
ENABLE trial participant



132

STAFF



10

PHD + MASTER'S STUDENTS



9

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IN THE NEWS



**'TIP OF THE ICEBERG':
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NZ Herald, October 2023



**MALAGHAN'S 'WINDOW
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The Post, November 2023



**TARGETING BACTERIA,
AND HEALTH INEQUITIES**

*RNZ Our Changing World,
June 2024*

STAFF ACHIEVEMENTS



JES BLAND

**FUNDRAISING &
PHILANTHROPY
AUSTRALASIA MOVER
AND SHAKER 2023**



DR KERRY HILLIGAN

**CIG WILLIAM E PAUL
AWARD FOR BEST
PAPER IN CYTOKINE
RESEARCH 2023**



KYLIE PRICE

**AUSTRALASIAN
CYTOMETRY
SOCIETY CAREER
RECOGNITION
AWARD 2023**



DR PATRICIA RUBIO-REYES

**KIWINET EMERGING
INNOVATOR AWARD
2023**



DR THERESA PANKHURST

**TE NIWHA KIA NIWHA
LEADER FELLOWSHIP
2024**

Too many of our loved ones are dying and suffering from diseases we don't know enough about. But we do know the immune system holds the key to prevention, treatment and cures.

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



Deeper understanding

We research to understand how to use the immune system to fight disease.



Better treatments

We develop new immunotherapies to more effectively treat disease.



Fairer access

We are committed to taking our research into the community to provide treatment options for all.

About us

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

Founded more than 50 years ago with a vision for independent medical research in Wellington, today the institute is committed to cutting-edge and translationally-focused research that leads to better, safer and accessible treatments for cancer, allergic and inflammatory conditions, and infectious disease.

Our value lies in being an independent research organisation backed by the community. As a registered charity, we are owned by New Zealand, for the benefit of all.



Our vision

A world where diseases are prevented, treated and cured through harnessing the power of the immune system.



Our mission

Our cutting-edge research leads to better, safer treatments for all.



Our values

Kia māia | be bold, courageous, ambitious

Mātaihia | investigating, seeking excellence

Manaakitia | nurturing, collaboration, generosity and respect

Āwhinatia | dedicated to benefitting others and improving global health

Chair's report



It has been a busy and eventful year here at the Malaghan. We have an outstanding team and as we adopt a new strategic plan and move ahead with future-proofing in mind, we have also focused on new appointments to our trust board.

The retirement last year of long-standing chair Graham Malaghan, the untimely death of trustee John Beattie, the retirements of Tim Bennett and Dr Di McCarthy and impending retirement of Nicola Sladden have necessitated a careful review of the skills required to strengthen and sustain our governance team. I am delighted that Dame Patsy Reddy, Sir Ashley Bloomfield and David Downs have accepted invitations to join our board and will be appointed at our AGM in December. The first two need no introduction and many of you will know of David Downs, ambassador to the Malaghan and a survivor of non-Hodgkin Lymphoma after receiving CAR T-cell treatment in Boston in 2017.

Financially, our accounts show we are in good shape with a significant surplus from a substantial legacy in 2023 (committed to future research programmes) and a smaller surplus this year from funds received in advance but committed to research in 2025 and beyond. Strip away these one-off income items and we operate at around a break-even level. Our budget for the current financial year is \$30 million, of which around a third is from government, leaving a substantial two-thirds to come from philanthropic sources. This is not sustainable and we are hopeful of receiving additional government support to ensure we can continue our life-saving research.

We are fortunate to enjoy widespread community support and my grateful thanks go to everyone who has helped us this year, with particular acknowledgment of our many dedicated significant long-term supporters. Underpinned by the Hugh Green Foundation and their five-year \$15 million commitment, two new major supporters have joined us recently – the David Levene Foundation and Sir Mark Dunajtschik and Dorothy Spotswood, who have committed substantial contributions to our CAR T-cell programme.

Last year we successfully completed our phase 1 CAR T-cell trial and we have just started our phase 2 trial. Assuming

similar results, our goal is to maximise the chances of timely uptake of our CAR T-cell therapy within the public health system at the end of the trial to limit gaps in treatment availability for those who need it. Currently this treatment is only available internationally at a price tag of over \$1 million per patient; ours will cost a fraction of that.

It will take more than \$15 million to run our phase 2 trial – the most ambitious thing we have ever done – and we are well underway with a capital campaign to raise the necessary funds, with the board underwriting the costs of the trial meanwhile to avoid delay. We have established a strong campaign cabinet chaired by David Downs to coordinate the fundraising, which focuses initially on major donor giving before going out to the public when substantial funds have been raised. In this context we have a very strong and supportive couple who have committed \$6 million on a matching dollar for dollar basis; with Mark and Dorothy's commitment we are now well advanced towards our target. As always, the last part of the fundraising is often the hardest and for that we will be going out more widely. In this regard our incredible Friends of the Malaghan are a powerhouse helping us build meaningful and long-lasting connections throughout New Zealand.

Our Māori advisory group, Te Urungi, is another powerhouse providing advice to our leadership team to improve health outcomes for Māori. We have an important meeting planned in Gisborne in November to kōrero how we can grow this relationship in a meaningful way and also work more closely with Gisborne-based Mātai Medical Research Institute.

In this, my first year as chair, I have learnt very quickly that “what you don't know, you don't know”. I have been exposed to many different organisations over the years, but I have loved how our trustees go about their role here and engage with the team. While it is easy to focus on the high profile projects like the CAR T-cell trials, all our projects are important and deserve acknowledgment. We have a truly dedicated staff committed to making a difference and for this I thank them, and all who support what we are trying to achieve.

SIR PAUL COLLINS | CHAIR

KNZM, BCA, ACA

Director's report



Despite tough times nationally and globally, spirits remain high at the Malaghan Institute. Challenge sharpens focus, and for us that is being clear about our priorities as a community-backed independent research organisation committed to making a positive difference.

The adoption of a new five-year strategy sets a clear path for growing a world-class biomedical research institute that our people and New Zealand can rally behind. It is the culmination of months of work led by our Deputy Director Professor Kjesten Wiig, crystallising not only who we are but where we're heading as an organisation – striving for a world where diseases are prevented, treated and cured through harnessing the power of the immune system.

Central to our strategy are three strategic pillars that lay out how we're going to get there: firstly, making sure our science is world-class and transformative; secondly, having ambitious motivated staff who strive to discover the unknown; and finally, forming partnerships with like-minded organisations to deliver greater impact from our science discoveries.

You can see these pillars reflected in this report – research highlights across our cancer, infectious disease, and allergic and inflammatory disease programmes. This includes making meaningful progress towards CAR T-cell cancer therapy becoming a standard of care in New Zealand; developing vaccines that stimulate an ageing immune system; preventing stomach cancer through eradicating the bacteria responsible; advancing understanding of the complex relationship between the skin, its immune cells and our health; and continuing to build capability in vaccine development on the back of our work during the pandemic.

The renamed Hugh Green Technology Centre speaks to the excellence in talent and technology we have been developing here, and the expertise required for an organisation like ours to deliver cutting-edge research. Likewise, our collaborations and partnerships are key to our success – from research partners like the Babraham Institute in Cambridge, UK, and commercial partners like BioOra Limited to all-important government funding, including through investment in the likes of the national RNA Development Platform.

At the heart of every successful research programme are talented individuals whose collective efforts drive transformative advancements in research. Among them, Prof Wiig – appointed in March 2024 as Deputy Director – who has been a driving force leading our vaccine development capability, including New Zealand's RNA platform. Similarly, Dr Rob Weinkove, who, along with his team, has demonstrated that there are no insurmountable obstacles to translating research into the clinic to deliver innovative new cancer treatments like CAR T-cell therapy in our hospitals.

Looking forward, we welcome Professor Brett Delahunt, a long-standing collaborator, who joins us as a Distinguished Research Fellow, offering much insight into improving diagnostics and understanding of metastatic cancer. In 2025 we also welcome Professor Michelle Linterman back to New Zealand from the Babraham Institute in the United Kingdom. As a leading immunologist and expert on the ageing immune system and vaccination, it is fantastic to have her come home to build a world-class research programme here at the Malaghan. We will also officially welcome Associate Professor Lisa Connor and her team, accelerating our infectious diseases and vaccine efforts.

As a charity, our philanthropic partners are the heart and soul of our enterprise. I am pleased to welcome new corporate partnerships in the last year including Chubb Life and Securecom. I also gratefully acknowledge long-standing backers like the Hugh Green Foundation and Freemasons New Zealand, as well as the many generous individual donors and trusts who keep us working at the scientific coalface.

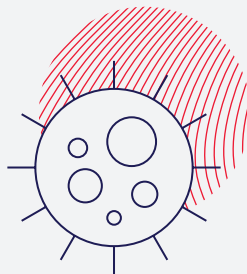
The resilience of the institute in the face of a significant recession is in no small part thanks to the continued support of our community. However, we cannot afford to overstep and stretch ourselves too thin. This means we need to constantly prioritise our science activities and move forward strategically, so that we can come through a stronger, more capable organisation.

We have our direction of travel, armed with a culture of discovery and ambition that is supported by partners who share our vision. The future is bright.

PROFESSOR GRAHAM LE GROS | DIRECTOR
CNZM, FRSNZ, FRCPA (Hon)

Harnessing the power of the immune system

With a focus on cancer, infectious disease, allergy and inflammation, our fundamental research is transforming our understanding of the immune system's role in disease prevention and treatment, providing exciting opportunities to translate new discoveries into new therapies.



CANCER

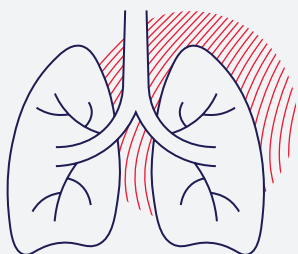
Immunotherapy is revolutionising cancer treatment, offering the exciting potential of highly personalised therapies, individually targeted to a person's cancer and immune system.

Cancer is the result of the immune system failing to effectively identify or remove cells that have begun to divide uncontrollably. Immunotherapies help counter this failure – assisting the immune system to better recognise and destroy cancer cells and to outsmart cancer cells that disguise themselves from immune attack. By activating and boosting the immune response, immunotherapies offer the potential for more durable, effective and gentler treatments.

Our research focuses on understanding cancer cells, the immune cells responsible for detecting and removing them, and the tumour microenvironment. This includes understanding how cancer cells evade immune detection and developing therapies to stimulate the immune system's cancer-killing properties. We're also focused on cancer prevention through better understanding the triggers and conditions that lead to disease.

Through bringing CAR T-cell therapy to New Zealand for the first time and advancing capability in ribonucleic acid (RNA) technology and applying it to our individualised cancer research, we are entering a new era of personalised and highly effective cancer therapies.





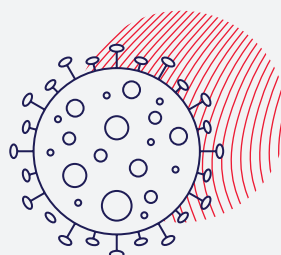
ALLERGIC AND INFLAMMATORY DISEASE

With rates of allergic and inflammatory conditions ever-increasing in New Zealand and around the world, understanding the root causes of these lifelong and often debilitating diseases has never been more important.

Allergic and inflammatory diseases are varied and affect people differently. However, they all have one thing in common: the immune system reacting and responding aggressively to something it shouldn't. Whether attacking the lining of the gut, a constriction of the airways, or a deadly food allergy, understanding what causes the immune system to behave in this way is key to developing new ways to treat these conditions – or better yet, stop their development in the first place.

Our research has shown the skin as a key site for the early development of many allergic and inflammatory conditions throughout the body. The gut also plays a vital role in inflammatory responses, where immune cells interact with both environmental factors and resident bacteria.

Uncovering how the immune system interacts with our environment in the skin and in the gut, and the genetic changes that dictate how our immune system differentiates between helpful and harmful, is central to stopping the development of allergic and inflammatory disease.



INFECTIOUS DISEASE

Through better understanding how our immune system fights infection, we can develop more effective, longer-lasting ways to prevent and treat a wide range of infectious diseases.

Our research is focused on investigating how immune cells respond to threats such as viruses, bacteria or parasites, so we can identify new ways to boost the protectiveness of our immune system at every stage of life.

Our expertise building vaccine development capability during the pandemic and now as part of the RNA Development Platform means we are well positioned to support New Zealand's response to current and future infectious disease threats.

As we embrace the exciting potential of RNA technology, we are poised to see a step change in how we tackle infectious diseases, with the capacity to develop safe, effective vaccines at speed for New Zealand-specific problems.

CAR T-CELL THERAPY: HOPE FOR KIWIS WITH BLOOD CANCER

By reprogramming a patient's own immune cells to recognise and eliminate cancer cells, chimeric antigen receptor (CAR) T-cell therapy has transformed the treatment of certain blood cancers internationally, offering long-term remission and, for some people, a cure.

The Malaghan Institute's CAR T-cell programme is driven by the goal of making this life-saving cancer immunotherapy a standard of care in New Zealand hospitals. It includes the country's first CAR T-cell trial, with onshore CAR T-cell manufacture and delivery alongside ongoing research to improve and expand this therapy.

In 2019, in partnership with Wellington Zhaotai Therapies, we launched the ENABLE clinical trial, to assess the safety of a new 'third generation' CAR T-cell therapy for B-cell non-Hodgkin lymphoma, and to develop and support the regulatory and clinical environment for safe CAR T-cell delivery in New Zealand.

In ENABLE, 30 New Zealanders were treated with the new CAR T-cell therapy, with results showing promise of being safer than leading commercial CAR T-cell products.

Importantly, none of the participants developed severe cases of neurotoxicity or cytokine release syndrome – common side effects of some commercial CAR T-cell therapies. The trial also demonstrated promising effectiveness, with around half of the participants' lymphomas demonstrating a complete response to treatment three months after receiving CAR T-cells.

ENABLE established automated manufacture and delivery of CAR T-cells by BioOra Limited, a New Zealand start-up

incubated at the Malaghan Institute and established with Bridgewest Ventures in 2021 to optimise and scale up CAR T-cell manufacturing in New Zealand.

"The main barriers to CAR T-cell therapy globally are the burden of managing side effects and the cost of the CAR T-cells themselves. By combining an improved safety profile with cost-effective manufacturing, we aim to address both issues," says Malaghan Institute Clinical Director Dr Rob Weinkove.

On the back of the promising phase 1 results, in July 2024 our phase 2 clinical trial – ENABLE-2 – got underway at Wellington Hospital.

ENABLE-2 will run over two years with 60 adults with certain types of relapsed or refractory large B-cell non-Hodgkin lymphoma treated. Having already assessed the dose and safety of the therapy, patients will be treated earlier in their treatment pathway.

"We are hopeful that treating patients earlier – as a second- or third-line therapy – will result in even better CAR T-cell outcomes as their immune system function may have been less damaged by their prior cancer treatments. This may also limit the need for patients to go through repeated chemotherapies with diminishing returns," says Dr Weinkove.

"The safety profile of our CAR T-cell therapy also means we can deliver it as an outpatient treatment, lowering the burden on patients and their whānau, and reducing costs to the health system."

What's the difference between the phase 1 and phase 2 CAR T clinical trial?

PHASE 1 : ENABLE



Treated 30 patients who had exhausted all other treatment options

Single trial location, inpatient treatment



Assessed safety and optimal dose

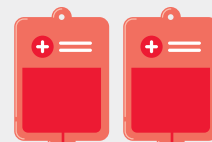
PHASE 2 : ENABLE-2

60 patients, will be treated earlier in their disease course



Multi-site trial across NZ, outpatient treatment

Assesses effectiveness and safety, integration with NZ healthcare system





▲ Danielle Sword

REDUCING STOMACH CANCER RATES AND DISPARITIES IN NEW ZEALAND

A new clinical research programme aims to increase the successful eradication of *Helicobacter pylori* (*H. pylori*), a bacterium that lives in the stomach and is the leading cause of stomach cancer. In May 2024 this programme was awarded a \$150,000 Explorer Grant from the Health Research Council of New Zealand.

H. pylori and stomach cancer disproportionately impact Māori and Pacific Peoples in New Zealand. When *H. pylori* is identified and treated, stomach cancer can be prevented. However, the ability to successfully treat and eradicate *H. pylori* with commonly used antibiotics is declining due to increasing antibiotic resistance.

Dr Tom Mules and Dr Stephen Inns, gastroenterologists at Te Whatu Ora Hutt Valley and clinical researchers at the Malaghan Institute and the University of Otago – Ōtākou

Whakaihu Waka respectively, are developing and validating new methods to test for antibiotic resistance in *H. pylori* to guide antibiotic prescribing.

Usually contracted in childhood, *H. pylori* infects the cells of the stomach, causing gastritis, or inflammation of the stomach lining. Left untreated, the inflammation can become chronic leading to tissue damage and ulcers and eventually, cancer.

“The best way to prevent stomach cancer is to eradicate *H. pylori*,” says Dr Mules. “However, *H. pylori* is becoming more resistant to antibiotics, limiting our ability to treat infections.

“This research has the potential to profoundly transform clinical practice, directly addressing and rectifying significant healthcare equity concerns in Aotearoa New Zealand.”

BUILDING VACCINE DEVELOPMENT CAPABILITY AND PANDEMIC PREPAREDNESS

With an established track record in immunology, vaccine design and translational research, the Malaghan Institute has continued to play a key role in building pandemic preparedness in New Zealand and exploring the potential of ribonucleic acid (RNA) technology.

Malaghan Institute Deputy Director Professor Kjesten Wiig leads Vaccine Alliance Aotearoa New Zealand (VAANZ) and was appointed co-director of the national RNA Development Platform in 2023.

“VAANZ was tasked with rapidly progressing New Zealand’s capability and capacity to develop and manufacture a Covid-19 vaccine and to lay the foundation for New Zealand’s response to future vaccine development, production and supply,” she says.

Thanks to significant government and philanthropic investment, VAANZ designed and manufactured a Covid-19 booster vaccine – Kiwi Vax – that is safe and effective in preclinical models and was developed at a fraction of the cost of commercially-developed vaccines.

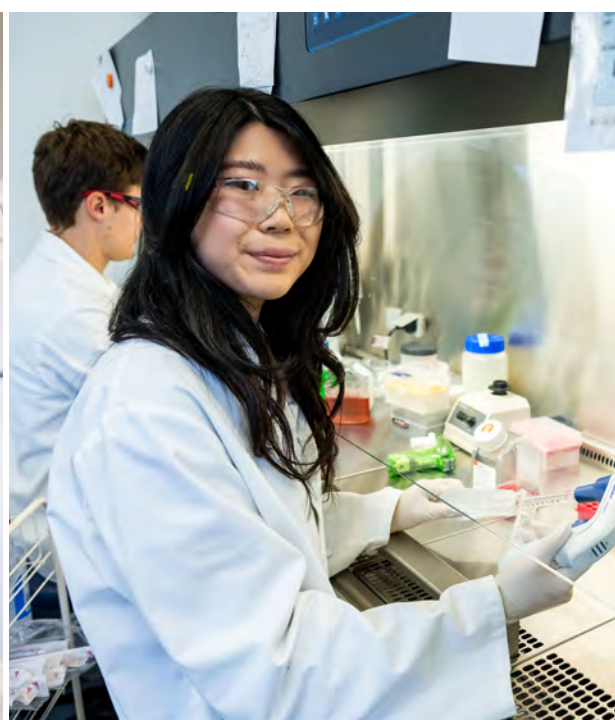
“We have successfully developed a novel spike protein vaccine candidate to where it’s ready to be tested in the clinic. This includes developing manufacturing, safety and toxicology studies, GMP methods and processes – everything needed to bring a product to trial,” says Prof Wiig.

“At this point we won’t be taking the vaccine to clinical trial for a number of reasons, including cost and ethical considerations. We’re not facing the same pressures from Covid-19 and the international market is not seeking new vaccines. But ultimately we have done what we set out to do – we have built capability here in New Zealand, for next time, and we have an asset parked on the shelf ready to use if needed.”

The VAANZ programme also laid the groundwork for RNA vaccine development, with significant donor funding enabling the Malaghan Institute to build New Zealand’s first end-to-end preclinical RNA therapeutics platform. In 2023, the government committed to a \$70 million investment into RNA technologies, establishing the RNA Development Platform to further advance this revolutionary field in New Zealand. The platform is hosted by Te Herenga Waka – Victoria University of Wellington and Waipapa Taumata Rau – University of Auckland, supported by the Malaghan Institute and the University of Otago – Ōtākou Whakaihū Waka.

Current Malaghan Institute RNA Development Platform projects include malaria, measles and liver cancer vaccine candidates and development of self-amplifying RNA, which has the potential to further improve RNA-based therapies and vaccines. Future applications include applying RNA to create new CAR T-cell therapies as well as vaccines for *H. pylori* and cancers.

▼ From left: Dr Bibek Yumnam, Annie Bai, Danielle Blud, Dr Puja Paudel



STRENGTHENING THE IMMUNE SYSTEM IN AGEING POPULATIONS

A collaboration between the Malaghan Institute and the Babraham Institute in Cambridge in the United Kingdom is investigating how the immune system changes as we age. The aim is to develop more effective vaccines that stimulate an ageing immune system to provide protection against infectious diseases.

Malaghan postdoctoral researcher Dr Theresa Pankhurst, who is currently working at Dr Michelle Linterman's lab at the Babraham as part of a Te Urungi Churchill College By-Fellowship and a Te Niwha Kia Niwha Leader Fellowship, is leading the collaboration. The vaccines will be tested in younger adult and aged mice, with their protective capacity then assessed after influenza virus infection by measuring if they can prevent lung disease through a method called plethysmography.

"This collaboration brings together the fundamental biology of the germinal centre response in ageing that we've developed at the Babraham Institute, with the Malaghan Institute's mRNA vaccine development platform," says Dr Linterman. "Our combined expertise puts us in a unique position to make and test new mRNA vaccines that we hope will rejuvenate the ageing immune system and promote health in the later years of life."

"Our combined expertise puts us in a unique position to make and test new mRNA vaccines that we hope will rejuvenate the ageing immune system."



INTERNATIONAL COLLABORATION FINDS LINK BETWEEN SKIN INFLAMMATION AND LIPID IMBALANCE

An imbalance of lipids in the skin may be a contributing factor to psoriasis according to a collaboration between the Malaghan Institute and Seoul National University. The findings offer vital clues in understanding the complex relationship between the skin, the immune cells that call it home, and our health.

Previous work from the Malaghan Institute showed skin-resident immune cells also play a much larger role throughout the body, likening the skin to a ‘ground zero’ for the development of these lifelong and often debilitating allergic and inflammatory conditions. This latest research, published in *Cell Reports*, expands on this, demonstrating how reduced chemical signalling molecule IL-13 can lead to lipid imbalance and compromise the integrity of the skin as well as its ability to control inflammation.

“Understanding the skin’s immune responses is essential for treating allergic reactions and other inflammatory diseases,” says Malaghan Institute Research Fellow Dr Sou Ochiai. “This research highlights the broad impact of immune cells and their products on normal skin function, and offers new avenues for developing treatments for skin diseases that could be translated into clinical interventions.”

“Understanding the skin’s immune responses is essential for treating allergic reactions and other inflammatory diseases.”

HUGH GREEN TECHNOLOGY CENTRE: A NATIONAL CENTRE OF EXCELLENCE

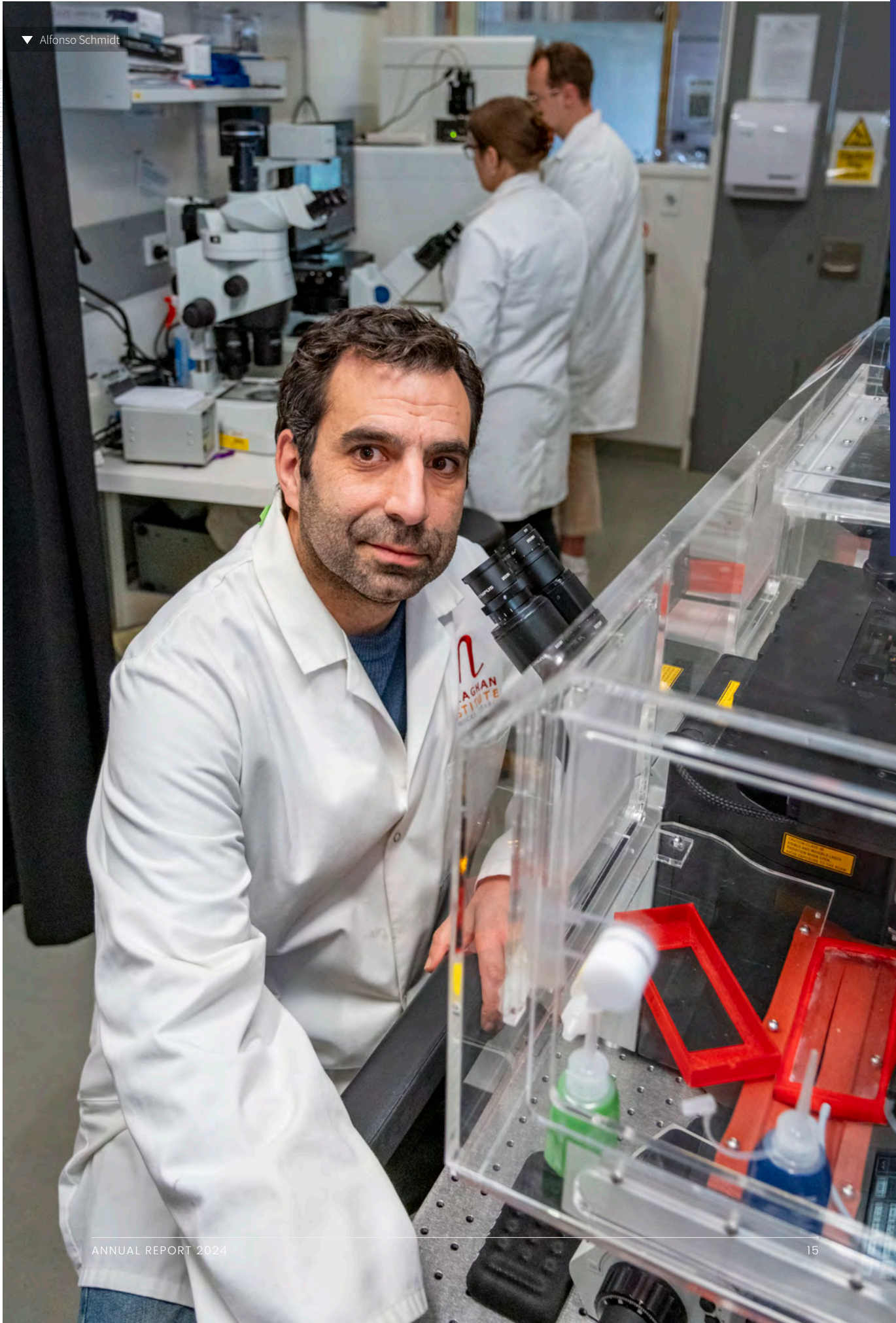
The Malaghan Institute’s research technology hub, the Hugh Green Cytometry Centre, has been renamed the Hugh Green Technology Centre to better reflect the broader capabilities and technologies this world-leading centre provides in supporting cutting-edge research at the institute and across New Zealand.

“Technology lies at the heart of research,” says Malaghan Institute Chief Technology Officer Kylie Price. “Over the past seven years, we have been steadily expanding our horizons and technology platforms to support research at the Malaghan and beyond. We now offer a much wider range of services than just cytometry. The rename is primarily to reflect what we already are: a national technology centre.”

The Hugh Green Foundation, a charitable trust dedicated to improving living standards and social well-being in New Zealand communities, has underpinned the Malaghan Institute’s research technology capabilities for more than 12 years. Initially focused on building capacity and expertise in flow cytometry – a scientific technique used to gain critical information about cells – the centre quickly expanded to include microscopy, genomics and more recently, data science. In December 2023, the Hugh Green Foundation pledged an additional \$15 million investment over the next five years to further expand capacity in flow cytometry and bioimaging, establish integrated capabilities in data science and genomics, and build a national bioanalytical services offering.

“We’re democratising access to cutting-edge technologies to advance medical research and foster innovation across New Zealand,” says Kylie.

▼ Alfonso Schmidt





▲ Takahiro Akagawa

▲ PCPhoto.com

RESEARCH BRIEFS



New research suggests hookworms could offer protection from severe Covid symptoms

Prior infection by a parasitic hookworm was shown to protect mice from severe SARS-CoV-2 disease, offering a potential explanation as to why certain human populations seemed to fare better during the height of the Covid-19 pandemic.

“This work stemmed from an observation that certain regions in the world didn’t fare as badly from the early days of the pandemic as you would expect,” says Dr Kerry Hilligan, who collaborated with colleagues at the National Institutes of Health in the United States on the study, published in *Science Immunology*.



Malaghan and BioOra deliver automated manufacturing to scale up CAR T-cell cancer therapy in NZ

In a significant milestone for New Zealand’s first CAR T-cell clinical trial, partners at the Malaghan Institute and BioOra started the clinical production of CAR T-cells using a new automated process – a shift that is key to scaling up this ground-breaking cancer therapy in New Zealand and “taking it to the people,” says Director Professor Graham Le Gros.

Manufacture of patient CAR T-cells now takes place in a closed system – Lonza’s Cocoon cell therapy manufacturing platform – providing significant advantages including increased throughput and lower costs, while maintaining quality.



Making RNA technology and techniques more widely available

The institute’s RNA team published several open access methods relating to the synthesis of mRNA and encapsulation in ionisable lipid nanoparticles in *Current Protocols*, allowing anyone with the right tools to unlock this revolutionary technology.



Study sheds light on why fruit and vegetables are good for gut health

Research from the Gasser Laboratory has offered new insight into how fruit and vegetables might protect against inflammatory bowel diseases. Previous studies looking at individuals with ulcerative colitis have found that their CD4+ T-cells, a distinct population of immune cells, have an altered expression of a molecule called G Protein-Coupled Receptor 15 (GPR15). The role of GPR15 is to help CD4+ T-cells migrate from the blood to the gastrointestinal tract, suggesting that modulating its expression could have some therapeutic benefit for inflammatory bowel diseases.

“We studied specific compounds derived from eating fruits and vegetables, namely polyphenol and glucosinolate metabolites. We showed they can indeed modulate GPR15 expression in CD4+ T-cells, a step forward in uncovering the intricate ways in which dietary compounds might influence our gut health,” says Dr Jeffrey Tang, who led this research.



Scientists identify interferon-gamma as potential SARS-CoV-2 antiviral

Conditioning the lungs with interferon-gamma (IFN-gamma), a natural immune system protein best known for fighting bacterial infections, appears to be a strong antiviral for SARS-CoV-2, in a study led by National Institutes of Health scientists and colleagues.

“Our study suggests that IFN-gamma could be used as a prophylactic option for limiting viral infections in highly susceptible populations, particularly if it is formulated as a nasal spray or similar,” says Dr Kerry Hilligan, who led this research during her time as an international research fellow at the National Institutes of Health.



NZ invention to enhance safety of CAR T and other cell therapies

An innovative ‘safety switch’ for CAR T-cell therapy, designed at the Malaghan Institute and recently patented, has the potential to significantly enhance the safety and accessibility of this cutting-edge cancer immunotherapy and other cell therapies. Developed by Dr Patricia Rubio-Reyes, the safety switch means that in the unlikely event that a patient who receives CAR T-cell therapy experiences severe side effects, a brake can be applied on CAR T-cell activity.



Study shows where MAIT cells live may determine their role in allergic disease

A study by the Gasser Laboratory has shown that a specific subset of immune cells called MAIT cells could both help and hinder the development of allergies depending on where they are found in the body. The research, published in *Allergy*, sheds some light on how researchers might develop future treatments for allergic disease by targeting key immune cells.



Gut permeability altered by chronic hookworm infection

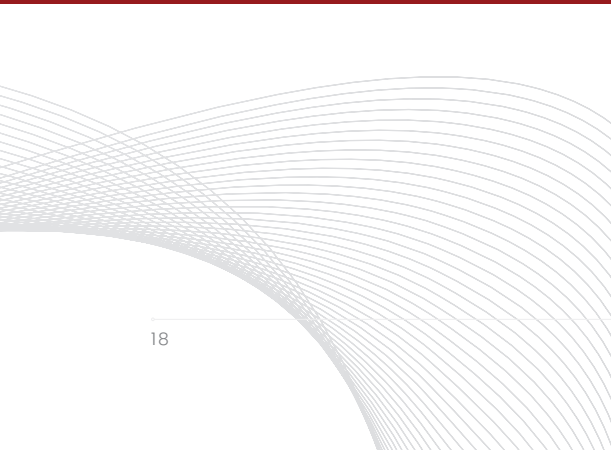
Increased gut permeability or ‘leaky gut’ is closely linked to the development of a range of inflammatory diseases – the same diseases from which intestinal hookworms are proposed to protect their host.

In this study led by Dr Tom Mules as part of his PhD research, changes in intestinal permeability in mice and humans experimentally challenged with chronic helminth infections were examined. Results, published in *Immunology & Cell Biology*, showed that different stages of the hookworm lifecycle affected gut permeability differently, which could have important health implications for humans infected with helminths.



New research deepening understanding of elusive eosinophils

Research undertaken by PhD student Sophia Noble has deepened understanding of the diversity of eosinophils, a type of immune cell involved in a range of diseases from parasitic infections to cancer. The study, published in *Immunology & Cell Biology*, helps further understanding of how immune cells protect us from disease.





▲ Tyler Johns

Publications

Oyesola OO, Hilligan KL, Namasivayam S, Howard N, Clancy CS, Zhao M, Oland SD, Kiwanuka KN, Garza NL, Lafont BAP, Johnson RF, Mayer-Barber KD, Sher A, Loke P (2023). Exposure to lung-migrating helminth protects against murine SARS-CoV-2 infection through macrophage-dependent T cell activation. **Sci Immunol.** 8(86):eadf8161.

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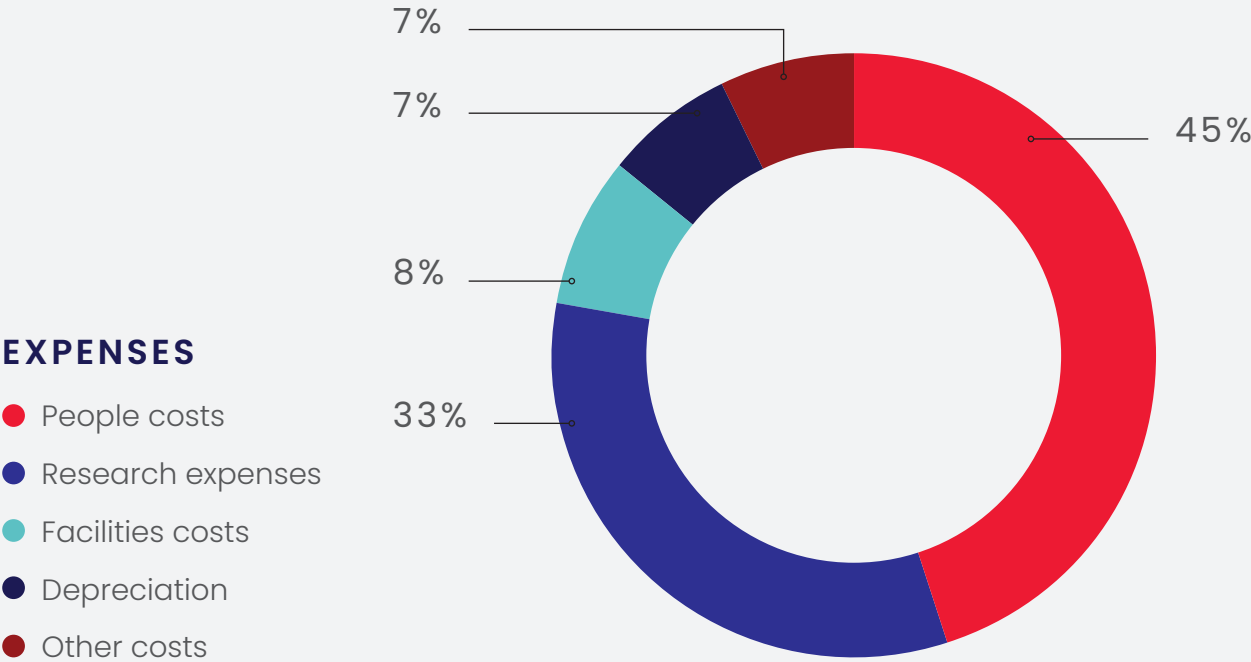
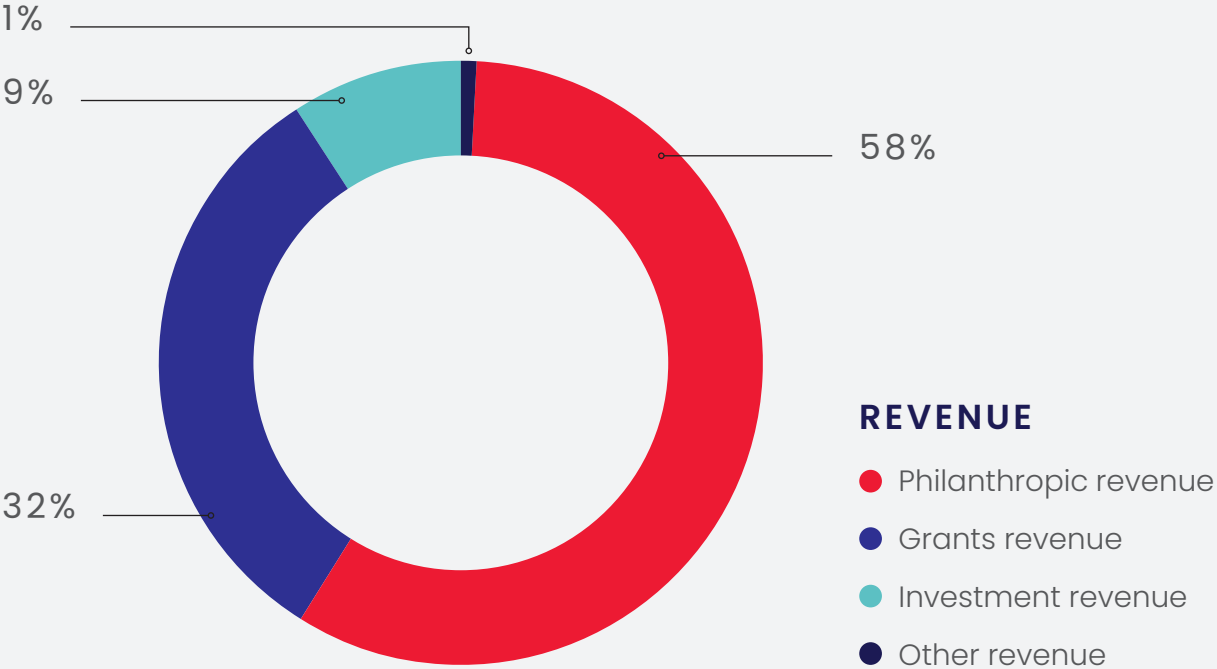
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Financial performance



FINANCIAL PERFORMANCE

For the year ended 31 July 2024

	2024	2023
Revenue		
Grants revenue	9,775,986	11,265,978
Philanthropic revenue	* 17,728,439	** 26,478,779
Investment revenue	2,623,512	1,437,276
Other revenue	209,224	131,871
	30,337,160	39,313,903
Expenses		
Depreciation	1,869,203	1,660,881
Facilities costs	2,004,416	1,907,850
Research expenses	8,861,306	9,130,708
Other costs	1,902,068	1,947,571
People costs	12,017,251	11,302,231
	26,654,245	25,949,241
Surplus / (Deficit)	3,682,916	13,364,663
Share of surplus/(deficit) of associates	–	–
Total comprehensive revenue and expenses	3,682,916	13,364,663

FINANCIAL POSITION

As at 31 July 2024

	2024	2023
	Consolidated	Consolidated
Assets		
Current assets	27,416,345	24,387,272
Non-current assets	21,515,649	24,124,318
	48,931,994	48,511,589
Liabilities		
Current liabilities	5,150,557	8,413,068
	5,150,557	8,413,068
Net assets	43,781,437	40,098,521

*In 2024 funds have been received in advance but are committed to science programmes in 2025 and beyond.

**In 2023 we received a significant bequest which is committed to future cancer research.

Without these income streams we essentially operate at a break-even level.

Thank you

Thank you to everyone who has supported the Malaghan Institute this last year. As a charity, support from the community underpins everything we do. We warmly acknowledge our Friends groups and those who have supported us financially and through sharing their expertise, time, stories and experiences, helping raise awareness of the Malaghan Institute and the importance of life-saving medical research in New Zealand.

A YEAR OF GENEROSITY AND IMPACT

This year, we had our best-performing annual appeal yet, with more than \$430,000 donated towards the research and development of better, kinder, accessible treatments for diseases that affect us all.

A special thank you to Kate Twigg, whose courage in sharing her personal cancer journey deeply resonated with our community. Her story was a powerful reminder of why we urgently need more effective and gentler treatments for diseases like cancer.

We were also thrilled to partner with Chubb Life, who generously pledged their 2024 donation as matched funding for our appeal. During the matched giving week, we saw remarkable generosity, raising more than \$100,000 with 279 matched gifts. Even more encouraging, \$62,000 of this came from new donors, highlighting the growing support for the Malaghan and our mission.



A SPECIAL THANK YOU TO:

Anonymous donors	Health Research Council of New Zealand	Merrilees Family Charitable Trust
Aotearoa Gaming Trust	Hugh Green Foundation	Ministry of Business, Innovation & Employment
BEA Trust	Jarden	New Zealand Community Trust
Betty Stoker Charitable Trust by Trustees Executors	John and Margaret Hunn Education Trust	Norman and Marion Allright Trust
Chubb Life	Just Paterson Real Estate Ltd	One Foundation
Coker Charitable Trust	Just Property Management Limited	The Paddy Brow Charitable Trust
Colin Williamson Charitable Trust	Keith Seagar Research Fund by Perpetual Guardian	The Parnell Hotel and Conference Centre
DJ and GN Price Trusts Partnership	KIA Taylor Trust	Pelorus Trust
David Levene Foundation	Kinetics Group Ltd	Polmadie Charitable Trust
The Dines Family Charitable Trust	Leukaemia and Blood Cancer New Zealand	Rex and Betty Coker Foundation by Trustees Executors
Edith Rose Isaacs Estate by Perpetual Guardian	Lexus New Zealand	Sandi Young
EM Pharazyn Charitable Trust	LifeBlood Trust	Securecom
Estates of Ellen, Sinclair, Barbara and Alison Wallace	The Lion Foundation	Spy Valley Wines
FH Muter Charitable Trust	Lois and John Roadley	The Thompson Family Foundation Inc
Freemasons New Zealand	Lois McFarlane Charitable Trust	Walker & Hall Trust
Frimley Foundation	Margaret Ann Tibbles Charitable Trust by Public Trust	Walter and Rana Norwood Charitable Trust
The Giltrap Trust	The Dr Marjorie Barclay Charitable Trust	Warren and Anne Plimmer Foundation
Glenpark Foundation	Maurice Capstick Medical Trust Fund	Zephyr
Grassroots Trust Central Limited		

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The Malaghan Institute trust board provides governance to the organisation, representing a balance of commercial and scientific expertise. The principal functions and operations of the board are to provide guidance and direction for the institute's key strategic and operational goals.



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| CHAIR

KNZM, BCA, ACA



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MBA, BCom



DR MAIA BREWERTON

MB ChB, FRACP, FRCPA



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MSc (Otago), PhD (CU), FRSNZ



PROFESSOR DAVE HARPER

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Distinguished trustees are recognised for their invaluable contribution to the organisation. Many continue to stay involved and give counsel to trustees.



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(to April 2024)
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(Hons), PhD (Auck)



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BSc (Hons) Otago, PhD (Massey)

Retired trustee recognised for tireless advocacy

Dr Dianne McCarthy has been made a Distinguished Trustee of the Malaghan Institute, recognising her service for and enduring relationship with the institute.

Appointed as a trustee in 2015 and most recently Chair of the Advocacy Committee, Dr McCarthy retired in early 2024. Malaghan Institute Chair Sir Paul Collins says the Trust Board unanimously supported her appointment as Distinguished Trustee.

“Di has been tireless in her advocacy for the institute’s work and its scientists. This is by no means a farewell to Di as I have no doubt she will continue to be a strong advocate for the Malaghan.”

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Trustee 1991-2023 (d 2023)

JOHN CARTER
Trustee 2003-2021 (d 2021)

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Trustee 2001-2014

DAN WILLIAMS
Trustee 2005-2020 (d 2023)

Te Urungi Māori

Te Urungi: the steering paddle of the waka which supports the work of the kaihoe by guiding the course.

Te Urungi Māori is an integral yet independent group at the Malaghan Institute, providing advice to the leadership team, with an overall approach of equitable health outcomes for Māori as a result of our research and clinical activity. The advisory group also provides guidance on engagement with and implementation of the articles of Te Tiriti o Waitangi and Vision Mātauranga.



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Dip Tchg



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