



Global networks tackling big problems of human health

Global problems require global solutions. And when it comes to addressing global health issues, international medical research networks are vital. These cross-border collaborations and relationships between scientists, laboratories and research organisations are essential for sharing knowledge, expertise and resources to advance understanding and ultimately find cures for the most pressing diseases of our time.

As New Zealand's centre for immunology research, the Malaghan Institute plays a key role in a number of important networks both in New Zealand and abroad. Our upcoming CAR T-cell cancer therapy clinical trial illustrates the progress that can

be achieved through collaboration. A partnership between the Malaghan Institute and the Chinese Hunan Zhaotai Medical Group, the trial combines cutting-edge CAR T-cell technology, developed in China, with our expertise and capability in cell-based immunotherapy and experience with clinical trials. The collaboration will not only give New Zealanders early access to this revolutionary new treatment, but may ultimately improve the effectiveness of CAR T-cell technology for patients worldwide.

It's not just in the CAR T-cell space that international efforts are transforming our understanding of the immune system – all our research benefits from scientific

collaboration that will shape the future of these exciting programmes.

At the National Institutes of Health in Washington DC, Dr Kerry Hilligan, a member of the Institute's immune cell biology team, is involved in an international collaboration investigating the early stages of allergic disease and how the immune system is shaped by its environment. Working with leading international scientists Dr Alan Sher and Dr Dragana Jankovic, Dr Hilligan is answering the big-picture questions of how this trained immunity may apply to allergic disease, cancer and vaccination strategies.

In a similar vein, a collaboration with the Weizmann Institute of Science
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From the Director



The physical and emotional cost of allergic diseases such as asthma is something particularly upsetting to me. Frustratingly, there is still much about allergic diseases that science simply doesn't know, and the triggers and changes to the immune system in the early days of developing an allergy remain obscured.

However, I am heartened by the hope that with continued investigation of the immune system and its interaction with our changing environment, we are not far off shedding vital light on these diseases, so that we will one day find effective treatments and ultimately cures.

It is with your continued support that we have the freedom to pursue our ambitions of creating a healthier, happier New Zealand.

Thank you

Prof Graham Le Gros
CNZM FRSNZ FRCPA (Hon)
Director

Continued from front cover

in Israel has had great success in tracking the journey of a pathogen through the immune system, helping us understand how the immune system functions on a cellular level.

"By following the individual cells that take up the different pathogens, you can really see the make-up of the immune response," says Professor Franca Ronchese, who led the Malaghan Institute's contribution to the research programme.

"Already by 24 hours you can see the differences between the response to an allergen compared to the response to a bacterial or fungal infection."

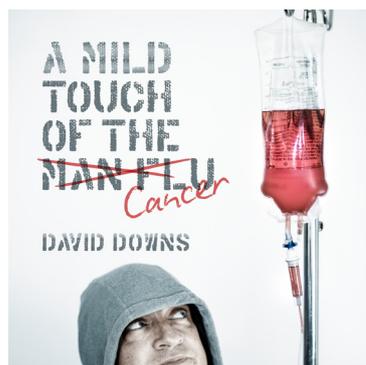
Professor Graham Le Gros says there are many reasons that collaborations are so important to accelerating the pace of medical research, discovery and application.

"These international collaborations plug us directly into the global conversation in the 'white hot' centres around cutting-edge science and technology developments. These collaborations are with people at the very top of their field," he says. "Professor Ido Amit at the Weizmann Institute is the world-leading single cell expert. Kerry is working with the world expert in tuberculosis research at the NIH. The value of having a presence at the table means we're at the forefront of important medical research and developments, and this relationship works both ways. Even though we're a small country on the other side of the world, we've more than proven our capability on the international stage in both the quality of our research and the calibre of our scientists.

"Ultimately, these collaborations internationalise research. They allow a vital interchange of fundamental and applied research across the globe between labs where expertise is shared for the benefit of all. Through insights and findings other organisations need and don't have access to, and vice versa, we can link major fundamental discoveries to effective clinical developments through this network of global science."

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- PROF LE GROS

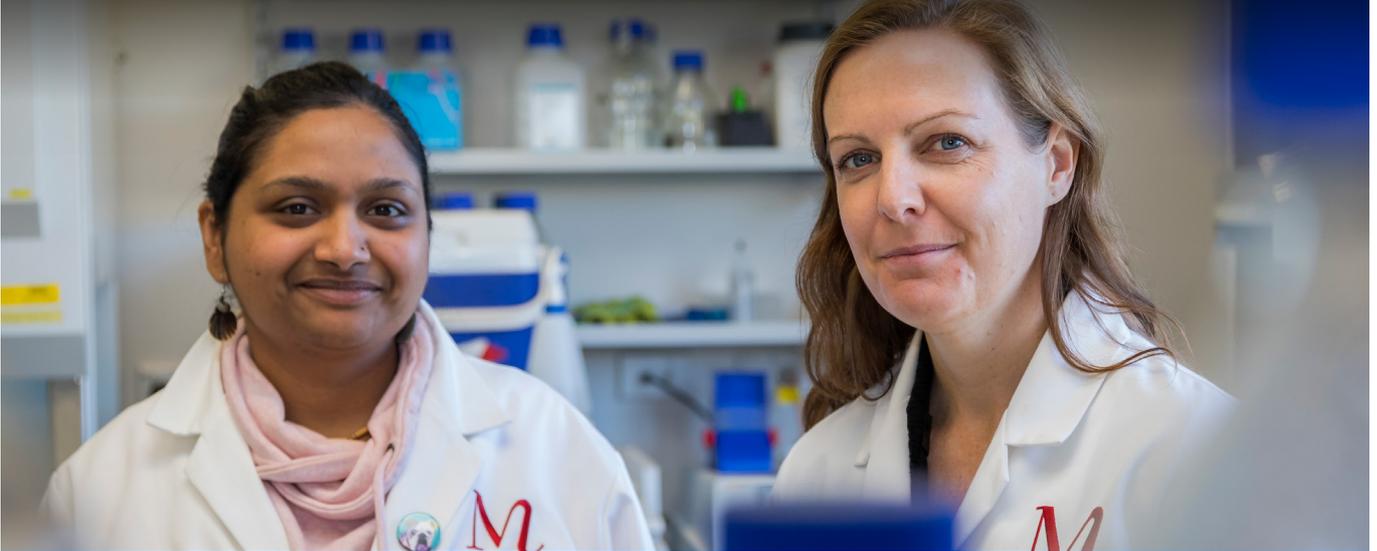


A Mild Touch of the Cancer

David Downs' new book documenting his journey with terminal lymphoma and fairytale outcome following CAR T-cell therapy will be released on 12 August. All profits will go to his Down with Cancer campaign supporting the Malaghan Institute's CAR T-cell programme, and to Leukaemia & Blood Cancer New Zealand.

RRP \$39.95 | AVAILABLE FROM MAJOR BOOKSELLERS OR AT WWW.MILDTOUCH.NZ

Unlocking the secrets behind 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. However, a team of researchers at the Malaghan Institute believe they can shed some light on phototherapy and, importantly, make it more effective for those suffering from allergic skin conditions.

"We believe that we have found the main mechanism behind this therapy," says Dr Olivier Gasser, whose translational immunology programme has been exploring what makes phototherapy outshine other treatment options for allergic skin disease.

Phototherapy involves shining a narrow band of ultraviolet (UV) light on a patient to treat various skin conditions, including eczema. 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. However, while the

causes of this therapeutic effect have borne several scientific theories, little scientific evidence remains as to what's going on at a cellular or biological level. That looks set to change.

Dr Gasser says his team discovered that the breakdown products of folic acid during phototherapy are very good agonists of MAIT cells – they block their function.

"Folic acid is found naturally within the skin. We demonstrated that when you block MAIT cell function, especially at the early stages, you basically have no form of allergic disease. Not only that, but we also found that you can enhance the effectiveness of the therapy by topically applying folic acid to the skin beforehand, to amplify its effects. Our next goal is to attract funding to progress this project and develop novel and exciting ways to apply these findings in relevant therapeutic settings".

Above: Dr Karmella Naidoo and Dr Katherine Woods of the translational immunology team



Above: Proferssor Braithwaite

Prostate cancer under investigation

Expanding the scope of cancer research underway at the Malaghan Institute, Professor Antony Braithwaite is researching prostate cancer, taking advantage of the Institute's world-leading technology platforms.

Prof Braithwaite, who heads the University of Otago's Cell Transformation Laboratory, will be investigating the underlying mechanisms and pathology of cancer cells in prostate cancer.

"We're incredibly excited to have the talented Prof Braithwaite here at the Malaghan Institute," says Prof Le Gros. "Antony is a fantastic scientist, making some real and powerful progress in the prostate cancer space."

International collaboration sensitising brain cancer to treatment

A new way to sensitise difficult-to-treat and aggressive cancers such as the brain cancer glioblastoma to radiation therapy has been unveiled thanks to a collaboration between the Louisiana State University and the Malaghan Institute.

Recently published in the journal *Redox Biology*, the research team found that prior treatment of glioblastoma tumours with sodium sulphide (H₂S) increases its sensitivity to radiotherapy, boosting the radiation-induced killing of the tumour.

Professor Mike Berridge, head of the cancer cell biology team at the Malaghan Institute, says that this work offers an exciting opportunity to improve treatment for this aggressive and treatment-resistant brain cancer.

"H₂S acts a bit like carbon monoxide," explains Prof Berridge. "It binds to respiratory proteins inside cells and affects their behaviour, including the function of their mitochondria, which in turn sensitises them to radiation treatment."

"Moving forward, we hope to develop further therapies that target the mitochondria within cancers and their ability to respire. Our collaborators in Prague are involved in some successful clinical trials at the moment that are targeting this mitochondrial respiration – it's all part of a bigger global picture of trying to direct cancer therapies towards one of cancer's main vulnerabilities."



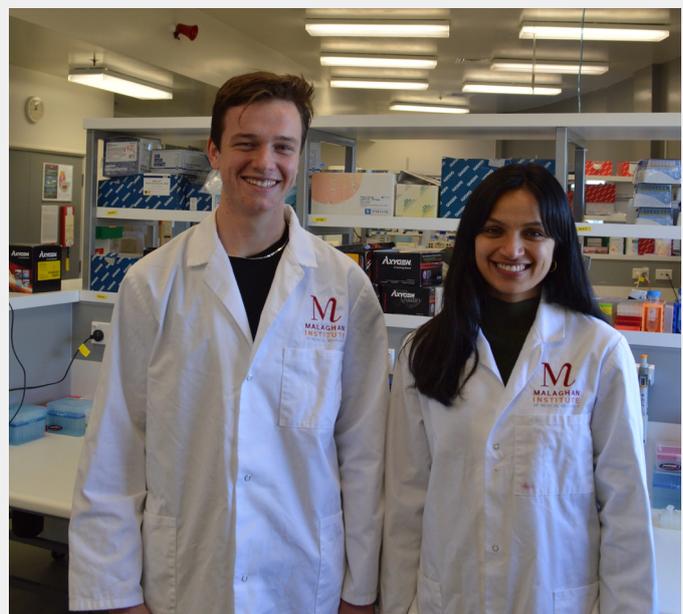
Above: Professor Mike Berridge

Joint award for Maurice Capstick scholarship

Congratulations to Research Officer Palak Mehta and honours student Michael Wilson who were both recipients of the 2019 Maurice Capstick Scholar Award. The annual award provides financial support to encourage the Institute's young scientists to actively seek opportunities to learn new skills and expertise to assist with their professional development.

Palak, part of Prof Le Gros' allergy and parasitic disease research team, will be using her portion of the scholarship to present a talk at the *Parasite and Helminths: New Perspectives in Biology and Infection* conference in Hydra, Greece, and will also visit other research laboratories in Europe.

Michael, who is a member of Professor Ian Herman's cancer immunotherapy programme, is planning a two-week internship at the Guangzhou Institute of Biomedicine and Health in China under the Malaghan Institute's CAR T-cell collaborator Dr Peng Li.



Above: Michael Wilson and Palak Mehta



International road trip: cytometry team presenting on cutting-edge technology

Representing the Malaghan Institute on the international stage, the Hugh Green Cytometry Centre team and fellow Malaghan Institute scientists recently travelled to the CYTO2019 cytometry conference, held in Vancouver this year.

"It was an amazing and busy conference where we were able to clearly demonstrate our expertise and knowledge in the field of spectral cytometry," says Head of Research Technology Kylie Price. "Our team presented on spectral cytometry and high-dimensional data analysis strategies, all which were well received and helped the team make important connections with other international scientists."

Above from left: Sam Small, Kylie Price, Dr Laura Ferrer-Font and Sam Old

Thank you to our partners



The Malaghan Institute wishes to acknowledge the support of the Health Research Council of New Zealand



Upcoming events 2019

Malaghan Institute display at Victoria University Open Day 2019
Victoria University of Wellington, Kelburn Campus
23 August | 8am-3.30pm

Malaghan Institute and Cawthron Institute Research Event
Cawthron Institute, Nelson
26 September | 1.30pm

For more information about these events please contact Gay Keast, Development Operations Manager: gkeast@malaghan.org.nz | 04 499 6914

BEQUESTS: ANOTHER WAY TO GIVE

Leaving a gift in your will to the Malaghan Institute is a personal and enduring investment in the future of biomedical research and discovery.

All gifts in wills, whatever the size, mean a great deal to us and the longevity of our research. You can help us shape advances in medical science and develop treatments that will benefit generations to come.

If you would like more information on how to make a bequest to the Malaghan Institute, or would like us to advise your lawyer, please contact Jenny Sim, Head of Development on jsim@malaghan.org.nz or 04 499 6914 x 811.

Please also get in touch if you have already made a bequest in your will, to let us thank you personally, involve you more in the Malaghan Institute today, and plan for the future.

Recent grants May - July 2019

Infinity Foundation Limited	James Russell Lewis Trust	EM Pharazyn Charitable Trust
Four Winds Foundation	Keith Seagar Research Fund	FH Muter Charitable Trust
Jennifer Smith Family Trust	Rex & Betty Coker Foundation	Florence Petersen Leukaemia Trust

PLEASE UPDATE YOUR EMAIL ADDRESS

Due to Vodafone's planned upgrade of its nationwide email service, a number of old email addresses will no longer be working after 21 August 2019. If you have recently updated your email address, please email fundraise@malaghan.org.nz with your new contact details.

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Please call to inform us of your donation so we can send your tax receipt. Donations over \$5 are eligible for a tax refund of up to 33%.

Or call **0800 MALAGHAN (0800 625 244)** to make a donation over the phone.



Research is our journey. Cure is our destination.