

The  
Westmead  
Institute  
FOR MEDICAL RESEARCH

ISSUE 9 SPRING/SUMMER 2024-2025

# DISCOVERY

# Message from the Executive Director

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I was delighted to recently join with WIMR's research leaders for a very inspiring Strategy Day.

This was an opportunity to review WIMR's strategy and vision for the future; assess our progress; and plan our next steps. As always, our focus was on developing new Precision Medicine approaches for preventing, treating and curing not only cancer but many of the major health issues impacting the health of people here in Western Sydney, Australia and globally.

Throughout the day, we heard updates from our research leaders regarding how recent advances in genomics and big data are helping advance Precision Medicine in patient care.

The high impact of their research and their vision for the future re-affirmed to me that WIMR's reputation as a global leader in Precision Medicine continues to rise.

**The outstanding talent at WIMR, combined with world-leading technology and a clear focus on translating research outcomes into clinical care makes WIMR a desirable location for gifted researchers worldwide to work and collaborate.**

As recognition of our standing in this field, and on behalf of the Westmead Health Precinct, WIMR won a \$3 million-dollar Critical Infrastructure Grant from the MRFF to establish PrecisionGO. PrecisionGO is a collaboration between research and industry partners and aims to develop end-to-end Precision Medicine pipelines accessible nationwide that will streamline research discoveries from the early stages

of a project, all the way through to integrating the findings into patient care. Led by Dr Maggie Wang and myself it is an exciting new initiative to expedite Precision Medicine across Australia.

In the last issue of *Discovery*, I wrote about the exceptional people at WIMR who drive our research discoveries. As we continue to attract and retain some of Australia's leading medical researchers, we are working hard to secure philanthropic support so that we can continue to grow our talent base and provide the latest technology to advance their cause. If you would like to learn more about how you can play a vital role in this endeavour, I encourage you to contact the WIMR Foundation team via [development@wimr.org.au](mailto:development@wimr.org.au).

I often speak proudly of the world leading research undertaken by WIMR's researchers, and I am delighted to share that two of our team were recently recognised with high profile recognition.

Professor James Chong, Co-Director of WIMR's Centre for Heart Research and leader of the Cardiac Regeneration research group was recently awarded the prestigious Jian Zhou Medal by the Australian Academy of Health and Medical Sciences. This medal is awarded annually to a rising star of Australian health and medical science, who is making a significant impact in translational medical science. This is a well-deserved honour for Professor Chong in recognition of his tireless work to improve outcomes for cardiac patients.

Associate Professor Thomas Tu from WIMR's Storr Liver Centre was chosen as a finalist of the Unsung Hero Sydney Award by the Committee for Sydney. He was also nominated for the People's Choice Award.

Thomas' research and passion for developing better preventions, and treatments for people who are living with Hepatitis B is remarkable. However, his dedication does not end there. Associate Professor Tu commits a substantial amount of his personal time and effort to working in the community, advocating for and supporting those living with Hepatitis B.

I offer my sincere congratulations to both Professor James Chong and Associate Professor Thomas Tu.

**Professor Philip O'Connell**  
WIMR Executive Director

**Cover Image** Human melanoma cell line growing in tissue culture.



## Vision researcher focused on glaucoma wins major award



WIMR's Associate Professor Andrew White has been announced as the recipient of the 2024 Glaucoma Australia Quinlivan Research Grant.

Associate Professor White, Director of our Centre for Vision Research is a scientist and ophthalmologist specialising in glaucoma. His innovative project will focus on the development of Irbesartan eye drops, repurposing a medication currently used to treat high blood pressure as a potential therapy in the treatment and management of glaucoma to halt disease progression and prevent blindness.

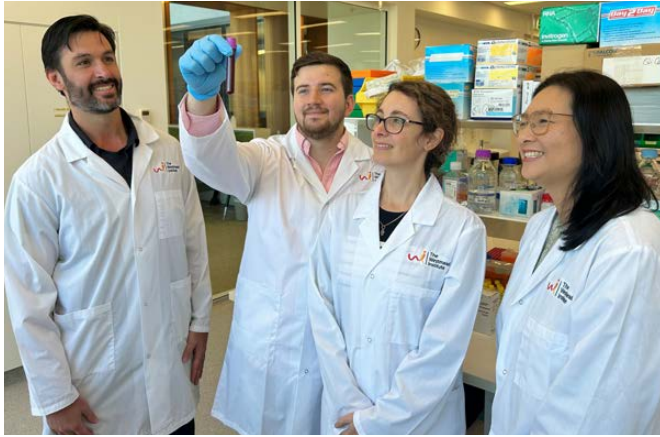
## WIMR researcher receives prestigious HIV/AIDS Fellowship

Congratulations to Dr Gabriel Duette, a postdoctoral fellow from WIMR's Centre for Virus Research, who was recently one of only three people globally to be awarded a Mathilde Krim Fellowship in Basic Biomedical Research.

This highly competitive Fellowship, supported by The Foundation for AIDS Research, facilitates the transition of an exceptional postdoctoral researcher to an independent career in HIV/AIDS research.



## Revolutionising Transplant Medicine – AI driven insights predict organ transplant success



In a groundbreaking study published in *Nature Medicine*, an interdisciplinary team of researchers led by WIMR have, for the first time, identified molecular biomarkers for transplant rejection that are common to all the major transplanted organs: hearts, lungs, livers, and kidneys.

This significant advancement led by Harry Robertson, a PhD student at the University of Sydney, and aspiring bioinformatician at WIMR, uses machine learning to predict transplant outcomes with unprecedented accuracy.

## New discovery explains why lean people are more likely to die from MAFLD

A world-first research discovery from the Storr Liver Centre at WIMR has identified why lean people with metabolic dysfunction-associated fatty liver disease (MAFLD) have higher mortality than their non-lean counterparts.

The research finding provides a new drug target for the development of potentially lifesaving treatments, as well as the potential to increase early detection.

MAFLD affects up to one third of the global population and is the leading cause of end-stage liver disease, liver cancer and liver transplantation. In Australia, the prevalence of MAFLD has been reported to be 20-30% and is the most common liver disease.



## WIMR clinical trials activity funded through more than \$10 million in NHMRC grant awards

This funding highlights the importance of WIMR's research commitment to ensure its research findings can be translated into clinical treatments that ultimately improve outcomes for patients.

Congratulations to the teams from the Centre for Infectious Disease and Microbiology, and Storr Liver Centre at WIMR for receiving NHMRC Clinical Trials and Cohorts Studies funding.

# WIMR continues pioneering advances in precision medicine



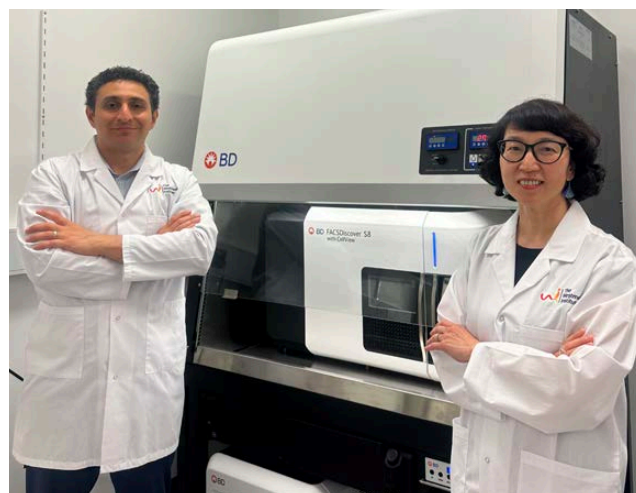
A new precision medicine initiative, spearheaded by WIMR, named PrecisionGO™, aims to develop end-to-end precision medicine pipelines accessible nationwide that will streamline research discoveries from the early stages of a project, all the way through to integrating the findings into patient care.

Dr Xin Maggie Wang, Director of Scientific Platforms at WIMR will oversee the PrecisionGO™ initiative. Dr Wang says, "To address current gaps in the precision medicine research pipeline, PrecisionGO™ will introduce four new technologies. These are high-speed, high-resolution imaging cell sorting; advanced single-cell spatial transcriptomics; high-throughput single-cell partitioning; and high-throughput digital PCR."

Dr Wang and her colleague, Dr Suat Dervish are recognised internationally for their expertise in cytometry (the analysis of cells or particles to determine their molecular properties and characteristics). Cytometry is how experimental treatments are tested to prove they're working.

Dr Wang and Dr Dervish's exceptional skills and depth of experience led US scientific equipment manufacturer BD to invite WIMR to partner with them in the development of a new technology – a high-speed imaging cell sorter. WIMR was allocated one of five prototypes and was the only location in the Asia Pacific region.

Thanks to the support and investment of the federal government for the PrecisionGO initiative, Westmead Hub partners, a generous philanthropist and a wonderful community of supporters, WIMR is excited and proud to have acquired the commercial model of this new equipment, the BD FACSDiscover S8. It is the only one of its type in Australia.



## Thinking about your legacy?

**By leaving a gift in your Will (bequest) to the WIMR Foundation, you can play a vital role in advancing medical breakthroughs and improving the lives of future generations.**

We always recommend that you consult a Solicitor when making or updating your Will to make sure it is legally binding, and your wishes are carried out as you intended. If you don't have a Solicitor, we can refer you to one of our Honorary Solicitors who would be happy to assist you in this process.

You may also wish to consider preparing or updating your Will online.

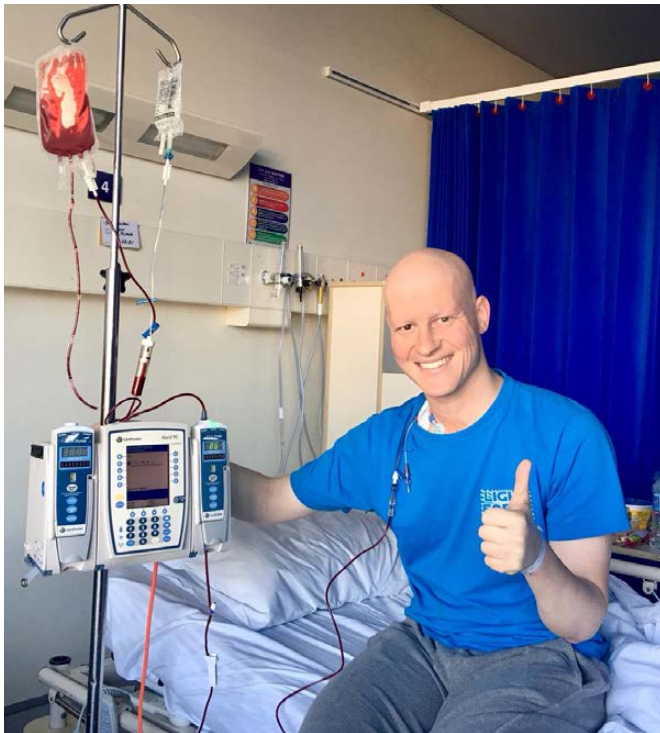
The WIMR Foundation has recently partnered with Australia's top-rated Will-writing platform, Gathered Here – an online platform that provides an easy and free step-by-step Will-writing service, and we are proud to offer this service to our community, completely free.

**You can get started on preparing your Will at [www.gatheredhere.com.au/c/wimr](http://www.gatheredhere.com.au/c/wimr)**

**For a confidential discussion, please email Umesh Paramasivam, Senior Individual Giving Manager [umesh.paramasivam@wimr.org.au](mailto:umesh.paramasivam@wimr.org.au), or give him a call on (02) 8627 3000.**

# The life-saving jigsaw solved by science

**“If I was diagnosed five years earlier, I would not be alive today.”**



**In December 2017, life was good for Joshua Polon. He was a fit 31-year-old man who loved going to the gym and working hard as a sales leader at Salesforce. He was in the best shape of his life.**

Until one day, he woke up with an enlarged lump on his neck about the size of a tennis ball. When antibiotics had little effect, Joshua was sent for a biopsy and the results came back positive for stage 3 lymphoma.

In an average, healthy body, lymphoma can be treated with chemotherapy. However, for Joshua, this approach was not successful.

After the first few cycles of chemotherapy, the tumours had barely shrunk. After intense chemotherapy, the situation for Joshua went from bad to worse. The tumours had still not shrunk and had, in fact, grown and spread.

Joshua's lymphoma was treatment resistant. A traditional bone marrow transplant was planned, but the chemotherapy required to prepare for that treatment was ineffective in controlling his lymphoma.

**The prognosis for Joshua was devastating. He was told that he had a one in three chance to survive five years.**

Instead of giving up hope, Joshua's family began searching for relevant clinical trials. They came across a new clinical trial at Westmead Hospital, led by WIMR's Associate Professor Ken Micklethwaite, and using CAR T cells.

WIMR's Cell Therapies Group, who were involved in Joshua's treatment, is led by Professor David Gottlieb, working alongside Associate Professor Micklethwaite and Associate Professor Emily Blyth who are senior research leads.

CAR T cell therapy involves taking a patient's own immune cells, reprogramming them in the laboratory to respond to a specific protein that is on the cancer cells. These cells are then infused back into the patient where they attack only the specific cancer cells.

Joshua was accepted into the CAR T cell clinical trial, but before this revolutionary treatment could commence, the medical team had to gain some control over Joshua's tumours. To do this, they treated Joshua with another round of incredibly strong chemotherapy. Simultaneously, the team were preparing Joshua's cells for CAR T cell therapy.

"I ended up in intensive care and I didn't come out for five weeks," recalls Joshua.

At the end of the cycle, for the first time since his diagnosis, Joshua's tumours had finally shrunk. It was now safe enough to start the CAR T cell therapy.

**The four-month regime of CAR T cell therapy worked, and Joshua's tumours slowly shrunk to only a few spots but did not completely disappear. Joshua went on to have radiation therapy and immunotherapy that finally brought his disease into remission.**

Throughout his treatment, Joshua's doctors had been investigating why his lymphoma was resistant to treatment. They discovered Epstein-Barr Virus (EBV)

in Joshua's tumour sample, and this was likely the main cause of the development of the cancer. EBV would also make a relapse of lymphoma very likely.

To remain completely cancer-free, Joshua needed something more. The team decided to try a second bone marrow transplant done differently from the first and specifically targeting the Epstein-Barr Virus in Joshua's lymphoma cells. The three biggest dangers for patients undergoing transplant are infection, disease relapse and a condition called graft versus host disease where the immune system from the donor attacks the patient and can make them unwell. The team at Westmead have been working on ways to address each of these risks separately, and painstaking clinical trials have been performed.

Understanding the high stakes for Joshua, Professors Gottlieb, Blyth and Micklethwaite worked together to design a bone marrow transplant procedure that specifically targeted all the risks that Joshua faced using innovative cell therapy that has been developed at WIMR over decades.

This included the last part of the puzzle which was to target the EBV. The team used tumour targeting immunotherapy, taking EBV-specific immune cells from Joshua's bone marrow donor, his sister, and growing and strengthening them in the lab, before treating Joshua. This will hopefully keep the EBV driven cancer in remission.

Despite many challenges, including more time in intensive care, the bone marrow transplant was a success.



Associate Professor Emily Blyth is a clinical and laboratory haematologist, blood transplant and cell therapies physician and the clinical lead for the Immune Effector Cell Service at Westmead Hospital. She is a research lead with the WIMR T Cell Therapies Group. Associate Professor Blyth said, "I am so happy that, in Joshua's situation, we were able to put all the pieces of this intricate jigsaw together.

"We're at the stage now where we can link each of those technological advances together to create a patient specific transplant procedure. We need larger trials, but we are hopeful that this approach will prove to be a much safer and more effective way of treating these cancers."

Since March 2020, Joshua has been in remission and remained healthy. He is active and working full time, while planning for his upcoming wedding to his fiancée, Rachel.

**Despite many hurdles, Joshua is incredibly grateful for WIMR's CAR T cell and stem cell therapy research that made his survival possible.**

"If I had been diagnosed five years earlier, I would not be alive today," said Joshua.

"I am so unbelievably lucky that I was able to access exactly what I needed at the exact point in time of human history that it was available for use."

Associate Professor Blyth said the research that saved Joshua's life requires more funding so it can continue to save many more lives.

"Funding is crucial. There's such a long way to go to improve outcomes for patients. Every patient is an individual, and we want to give each of these people the best chance of a healthy, cancer free future."

# The eye-opening link between sleep and cancer

When someone is ill, well-wishers often share encouraging thoughts like, “rest up”, or “a good night’s sleep will work wonders.” However, what if a person’s sleep patterns are actually contributing to, or perhaps even causing their illness?

Associate Professor Kristina Kairaitis leads the Sleep and Cancer Research Group at WIMR, where she is seeking to understand the interactions between sleep disorders and various forms of cancer, including breast and endometrial (uterus) cancers, and melanoma.

## Why do we sleep?

There are a number of biological and neurological reasons why we need to sleep, including:

- Conserving energy
- Maintaining normal metabolic, cardiovascular and immune function
- Clearing waste from the Central Nervous System or, quite literally, brain washing
- Synaptic downscaling: Clearing unnecessary information so we don’t exceed the brain’s available energy and space
- Helping our brains to retain information.

There are a number of sleep disorders that reduce the quality and quantity of sleep and, in turn, can impact our health. These include:

- Disorders that relate to breathing, like sleep apnea
- The inability to go to sleep or stay asleep (insomnia)
- Excessive sleepiness and the inability to stay awake during the day
- Circadian rhythm sleep disorders – when the body’s internal clock, which is set by exposure to sunlight and tells us when it’s time to sleep or wake, is out of sync with the environment
- Sleepwalking and talking
- Sleep-related movement disorders like restless leg syndrome, leg cramps, and clenching and/or grinding of teeth.

## Are sleep disorders associated with some cancers?

Associate Professor Kairaitis says that there is increasing evidence that patients with cancer have some of these sleep disorders.

“Our team spoke with people who have a history of breast cancer, endometrial cancer and melanoma and asked them about their quality of sleep, symptoms of sleep disturbance and the severity of these symptoms.

“We discovered that endometrial cancer patients seemed to have equal representation across a range of symptoms. Breast cancer patients were more likely to experience insomnia and severe sleep dysfunction, and melanoma patients were more likely to have sleep apnea-type symptoms.”

**This raised the question, what are the interactions between cancer and sleep? Does having a sleep disorder cause cancer, or does it make your cancer worse?**



Associate Professor Kristina Kairaitis in the Ludwig Engel Centre for Respiratory Research sleep lab at WIMR.





## Sleep apnea and cancer

Previous studies have investigated a link between the severity of sleep apnea and the likelihood of being diagnosed with cancer, and the severity of cancer. The studies found that if you have untreated severe sleep apnea, the chances of being diagnosed with cancer, and dying of cancer, are higher.

Associate Professor Kairaitis explains, "We think this is due mostly to the lack of oxygen rather than the sleep disturbance. When we break down the amount of time patients have low oxygen saturation while they sleep, it correlates with a much higher likelihood of developing cancer.

"My team and I conducted sleep studies on women with a history of breast and endometrial cancer, and we found that a lot of the study participants had moderate to severe sleep apnea.

"The good news is, in these women, we were unable to find any link between the severity of an individual's sleep apnea and the severity of their cancer."

However, in melanoma, researchers discovered that there does seem to be a link between the severity of a person's sleep apnea and the severity of their melanoma. Studies in Spain showed that oxygen deprivation, similar to that experienced with severe sleep apnea, led to increased growth and severity of melanoma. There is also evidence that treating patients with melanoma who have severe sleep apnea reduces the likelihood that they will have a melanoma recurrence.

**The WIMR team is conducting studies investigating the link between oxygen delivery and the melanoma site in patients with sleep apnea and melanoma. This will help us understand which melanomas are particularly susceptible to fluctuating oxygen levels in the skin.**

## Circadian rhythms and breast cancer

Associate Professor Kairaitis says, "Sleep is a real issue for those who have a history of breast cancer. Up to 65% report poor sleep, specifically falling asleep, staying asleep and the overall quality of sleep. Sleep is determined by a combination of behavioural impacts and circadian rhythms.

"Circadian rhythms impact more than just our sleep. Every cell has a circadian rhythm, and these peripheral rhythms are controlled by central circadian rhythms. There is evidence that disrupted central circadian rhythms increase the likelihood of breast cancer, with night shift workers more likely to develop a range of cancers including breast cancer. What is not clear is whether there are disrupted circadian rhythms in women with a history of breast cancer."

**The WIMR research team has now begun a study to identify how and why circadian rhythms might be abnormal in women after they have been treated for breast cancer.**

"There are a number of possibilities. Could it be that the breast cancer caused abnormal circadian rhythms? Could it be that the abnormal circadian rhythms predated the person's cancer diagnosis? Could it be due to the individual's sensitivity to light exposure? Could it be environmental light exposure, for instance if they spend a lot of time in a dimly lit room?"

To find the answers, Associate Professor Kairaitis and her team are conducting a study where women who have been treated for cancer spend a set amount of time in a dark room and then again in a well-lit room.

"We will be measuring their melatonin output, which is the best measure we have of circadian rhythms. We will then compare these results with those of women who have not been diagnosed with breast cancer.

"I think, if we can understand how sleep interacts with cancer, not only will we improve quality of life for people with cancer, we will also have a better understanding of the fundamental reasons why cancers develop in the setting of night shift work."

**To learn more,  
please scan here:**



# WIMR Out and About

## Discovery Partners

The Discovery Partners High Tea has become one of the WIMR Foundation's signature annual events. Guests at this year's gathering in May were fascinated to hear from Associate Professor Joanne Reed, Director of the Centre for Immunology and Allergy Research.

Guests were entertained by opera singers and chatted with like minded friends committed to leaving a legacy for future generations.



## The joy of trains comes alive at the Galston 500!

The Hornsby Model Engineers, and their volunteers, hosted the annual Galston 500 event to raise vital funds for Dr Grant Parnell and his global research into multiple sclerosis.

Particular thank you goes to organiser Allie Thackray for her continual hard work and commitment to WIMR.

## WIMR WALK to save lives

The WIMR WALK to save lives saw many supporters get out and about in June to raise funds for our life-saving research. Special thanks to our event partners Coleman Greig Lawyers and Dooleys Lidcombe Catholic Club for their enthusiasm and support. Some of our researchers joined the Coleman Greig Lawyers Parramatta team who finished their fundraising efforts with a fun BBQ picnic in Parramatta Park!



## Sydney Science Week

This inspiring event at WIMR in August saw a diverse audience, including many schools and members of the general public, eager to learn from two WIMR researchers about phage therapy and the relationship between sleep and some cancers.

## Teal We Find a Cure

Wonderful Monica Matak-Evans and husband Peter, had one of their best events yet to raise awareness and funds for Ovarian Cancer research here at WIMR. It was a huge success as guests heard from leading WIMR researcher Professor Anna DeFazio AM whose INOVATe initiative is achieving results and offering hope to the many who live with this difficult diagnosis. A big thank you to Monica and Peter for all their efforts getting prizes and rallying everyone to make it such a lovely day!



## Abal Banking

Abal Banking again hosted its highly successful World of Wonders Brunch. For many years, Abal Banking has demonstrated unwavering commitment by generously contributing to Associate Professor Eddy Kizana's groundbreaking heart research.

As always, Maureen Rizk OAM, Raghida Younes and their talented team went above and beyond, making the day a resounding success. Together, the attendees raised close to \$100,000 for WIMR research, a testament to their incredible generosity. What makes this achievement even more impactful is that \$50,000 has been matched by The National Stem Cell Foundation of Australia (NSCFA) instantly doubling the funds available to accelerate progress.



## Breakthrough Meet the Researcher Seminar and Morning Tea

In September, Professor Anna DeFazio AM and Associate Professor Emily Blyth presented their pioneering work developing precision medicine treatments for ovarian cancer and blood cancers, including updates about how their new therapies are already achieving transformational impacts for patients. Guests enjoyed the opportunity to chat with the researchers and enjoy morning tea together.



## Join us for Racing for Research

Saturday  
8 February,  
2025 at  
Royal  
Randwick



# Outstanding research requires exceptional people

You don't have to be a medical researcher to make a difference.

Support WIMR today to help improve treatments, prevent, and cure some of the most serious health issues affecting Australians and people around the world.



Visit our website to donate now. Simply hover your phone over the QR code or visit [wimr.org.au](http://wimr.org.au)



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## I would like to receive information and occasional updates from WIMR.

- Yes, via email please
- Yes, via mail please
- No thank you. Please do not send me any regular correspondence.

## I would like to donate the following amount to help fund vital breakthroughs at WIMR:

\$25  \$50  \$100  \$250  \$500

Another amount: \$ \_\_\_\_\_

I would like to make this a regular, monthly donation.

Donations of \$2 or more are tax deductible.

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To find out how your support can make a difference, contact the WIMR Foundation team at [development@wimr.org.au](mailto:development@wimr.org.au) or phone 02 8627 3000.

A gift in your Will, "in memoriam", and in celebration of special events are wonderful ways to support our life-changing research here at WIMR.

**For a confidential conversation please contact the Foundation at [giftsinwills@wimr.org.au](mailto:giftsinwills@wimr.org.au)**