The Westmead Institute
FOR MEDICAL RESEARCH

**ISSUE 11** SPRING/SUMMER 2025-2026

# DISCOVERY

# Message from the Executive Director

**As mentioned previously in Discovery magazine, in collaboration with its Precinct partners, WIMR has established a new initiative named PrecisionGO™. This exciting initiative was facilitated by a $3 million National Critical Infrastructure Grant from the Medical Research Future Fund and was further supported by a generous philanthropic donation.**

PrecisionGO™ is housed at WIMR, and brings together facilities and expertise in genomics, proteomics, cytometry, bioinformatics, biobanking, imaging, bioresources, and histology into a one-stop-shop, tailored, precision medicine hub for clinicians and researchers across Australia.

By integrating genomics, bioinformatics, and big data science in one location, as a tailored service available nationwide, PrecisionGO™ will enable more accurate diagnosis of diseases, leading to improved treatment and reduced healthcare costs. It also aims to bridge the gap between research and clinical practice through innovative state-of-the-art technologies promoting collaboration between research groups and clinicians. It is paving the way forward for a new era of personalised healthcare, which will improve patient outcomes and reduce the national disease burden through embedding precision medicine into clinical practice.

Since the grant was awarded, the PrecisionGO™ team has been working hard to deliver this ambitious plan. They have installed six new technologies including advanced high-speed cell sorting that can isolate rare cells from the peripheral blood. It has the most advanced technology for analysing thousands of genes at a single cell level in tissues, called Xenium and Cytassist, as well as the latest high throughput technologies for looking at gene expression in cells and tissues.

Now that PrecisionGO™ is established we are working with research teams at WIMR and across the Westmead Health Precinct to:

- **Streamline Biomarker Discovery**: this will provide insights into disease mechanisms and guide personalised treatments.
- **Advance Clinical Trials**: by identification of new patient subgroups using genomic and environmental data, researchers will be able to develop more targeted and effective clinical trials.
- **Enhance Research Capacity and Capability**: PrecisionGO™ is the ideal environment for fostering collaboration between clinicians based at Westmead Hospital with research groups based at WIMR.
- **Improving Clinical Outcomes**: ultimately a better understanding of disease will lead to better informed clinical trials which is the forerunner to better patient outcomes.

These are exciting times to be involved in medical research and many of the research groups at WIMR are part of a revolution in our understanding of disease. Special thanks go to Dr Maggie Wang and Roshni Sharma who are the driving force behind the establishment of PrecisionGO™. I encourage everyone to visit the PrecisionGO™ web site (https://www.precisiongo.com.au/).

Under the guidance of Associate Professor Joanne Reed, the team is also developing outstanding education programs for health professionals as well as members of the community who are interested to learn about the adoption of precision medicine approaches. Thank you for joining us on this exciting journey and I look forward to bringing further updates from the outstanding research teams at WIMR.

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

**Cover Image**
(R) Genes expressed in response to a vaccine, in this case an inflammatory protein called interleukin-1b (yellow dots) can be visualised in individual cells to build up a detailed picture of how the immune cells respond to a vaccine.

This image was taken by Dr. Van Anh Vo and PhD student Sifan Zhang.

# WIMR in the News

## New study rethink's role of gene in late-onset Alzheimer's and other neurodegenerative diseases

**A genetic variant known as APOE ε4 has, until now, been considered the strongest genetic risk factor for late-onset Alzheimer's disease.** A new study reveals that APOE ε4 functions as a broad immune modulator, creating a built-in vulnerability to a range of neurodegenerative diseases, not just Alzheimer's. This discovery lays the foundation for developing precision biomarkers and targeted intervention strategies for a range of neurodegenerative diseases.

The lead researcher on this study, Dr Caitlin Finney, was recently awarded funding from the Medical Research Future Fund (MRFF) Early to Mid-Career Researchers Initiative for her innovative approach to understanding the development of Alzheimer's disease. Dr Finney was also named the recipient of The Paul and Valeria Ainsworth Precision Medicine Research Fellowship.

## From diagnosis to discovery

**A recent WIMR study conducted by Dr Maryam Shojaei and her team sheds light on the role of an immune response biomarker known as Interferon Alpha Inducible Protein 27 (IFI27).** First identified 12 years ago at WIMR, IFI27 is emerging as a key factor in a range of host immune responses and is potentially implicated in not only infectious diseases, but also cancer, autoimmune disorders and inflammatory conditions. It was recently included in a US rapid blood test that helps clinicians assess infection type and severity, with the goal of improving outcomes and healthcare efficiency.

## New funding helps bring stem cell-derived heart muscle closer to the clinic

**Professor James Chong has been awarded funds from the Medical Research Future Fund's Stem Cell Therapies Mission.** The project aims to develop heart muscle grafts that have been created from stem cells. This project builds on the WIMR team's previous work, creating and improving new heart muscle using stem cells, with the aim of using these cells as grafts to repair damaged heart muscle. The project also adds to our understanding of patient requirements so that the grafts can progress to the clinical trial stage.

# WIMR in the News

## Funding opens door to new treatments for autoimmune blistering disease

**The Danish-based LEO Foundation awarded funding to WIMR's Associate Professor Joanne Reed and her team, which will seek to uncover the causes of treatment resistance in autoimmune blistering disease**, with the aim of improving treatment outcomes and monitoring of patients with autoimmune skin diseases. The funding will allow the WIMR team to access patient biopsies from volunteers treated at Westmead Hospital, and to use cutting-edge technology from WIMR's PrecisionGO™ to uncover the molecular mechanisms that drive individual patient responses to therapy.

## Discovery opens door for new antifungal drug

A recent study by Associate Professor Julie Djordjevic and her team has established that an inositol polyphosphate kinase (IPK) inhibitor, DT-23, could be the key to creating a new class of urgently needed antifungal drug that works differently to current therapies. When used with existing drugs, DT-23 could help to reduce their toxicity. Invasive fungal infections are a major health concern globally, affecting more than 6 million people worldwide each year and resulting in approximately 2.5 million deaths annually.

Read more about these and other WIMR news stories at wimr.org.au

# WIMR's Sleep Lab Set to Rise and Shine

**Many medical research projects had to be put on hold or stopped completely during the COVID-19 lockdown, and some are only now returning to full capacity. WIMR's Sleep and Cancer project is one example.**

As the lockdown began, sleep studies being carried out at WIMR had to cease and the sleep laboratory was shut down. In preparation for the studies to recommence, the laboratory has had to re-start its processes to ensure it operates at the previous exceptional standard.

Ms Anne Drury, WIMR's Sleep Research Facility Manager says, "We have recommenced studies and analysed the data, and our team has met the exceptional standard of pre-COVID data. After successful overnight studies, we have data that will be presented at the upcoming World Sleep Conference.

**"In designing the lab, we have focused not only on the state-of-the-art equipment but also ensuring the comfort of our volunteers. They will be with us in the lab for many hours, so we have tried to create an environment that is more like a bedroom than a lab. This optimises the comfort of the participant, as well as the potential for a good night's sleep and good results from the study. The forward-thinking design of the sleep lab means it is a place where many different sciences can intersect with our state of the art laboratory."**

The fully equipped sleep laboratory can perform overnight sleep and circadian rhythm studies and is currently a vital tool in a research project that examines the link between circadian rhythms and breast cancer.

Associate Professor Kristina Kairaitis leads the Sleep and Cancer Research group at WIMR. Explaining this project, she says, **"Sleep is a real issue for those who have a history of breast cancer. Our research project aims to identify how and why circadian rhythms might be abnormal following breast cancer treatment."**

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 controlled lighting (lux) environment: dim light <1 lux (the equivalent of one candle) and a brighter light environment 100 lux (the equivalent of 100 candles).

The study has commenced with participants in the 'dim light' setting, to accurately measure the strength and timing of their circadian rhythms. This is done by measuring their nocturnal melatonin secretion.

In an upcoming study, the team will build on this study by assessing patients in both dim and brighter light settings, to further understand how their circadian rhythm operates.

Professor Kairaitis explains, "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.

**"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."**

For more information on WIMR's Sleep Laboratory, visit:

# Adjuvants: A Booster-Shot for the Future of Vaccines

**Many of the world's most deadly diseases have been almost eliminated thanks to vaccines – diseases like polio, smallpox and even measles. However, there are still many deadly and debilitating diseases prevalent around the world. So, how do we ensure vaccines continue to be safe and effective?**

Dr Kerrie Sandgren co-leads the Vaccines and Adjuvants research group at WIMR, alongside Professor Tony Cunningham AO. The purpose of the group is to understand how vaccines and adjuvants work, which is essential for the future of effective vaccines.

## What is an adjuvant?

**An adjuvant is an immune stimulant – an ingredient that is added to a vaccine to trigger the immune system into producing a stronger response that targets the virus, and to improve the vaccine's effect.**

Traditionally, vaccines include a harmless version of the virus (or part of it). When introduced to the body, the vaccine teaches your immune system to recognise the pathogen and develop defences to fight it. This helps to prevent future infections and illness without exposing a person to the full effects of the virus.

Unfortunately, older adults typically don't respond as well to vaccines as younger people due to the natural decline in their immune system, but researchers believe that adjuvants could be the key.

Dr Sandgren explains, "Adding the immune provoking power of adjuvants has proven to be a game changer for vaccines. The beauty of it is that we can make sure we're eliciting just the right kind of immunity to fight that specific pathogen.

"I'm very interested in a particular adjuvant called AS01 that has, so far, been used in successful vaccines for older adults, including the shingles and RSV vaccines.

"We have a lot of information from previous research, including clinical trials of these successful vaccines. However, it's important to understand why this adjuvant works so well in this group of people. Once we do, we can make sure that future vaccines tick the right boxes to ensure the good responses are replicated."

WIMR's location at Westmead offers the research team a unique relationship with some cancer surgeons at Westmead Hospital. Using lymph nodes donated by people being assessed for breast cancer, Dr Sandgren's team have developed a unique model to study how vaccines work.

Lymph nodes are the command centre for immune responses and Dr Sandgren says, "We are incredibly grateful to these brave people that are going through such a stressful time. They are willing to contribute to our research by providing us with these vital samples – the actual lymph nodes that first interact with a vaccine – and that is an incredibly valuable donation."

The team also has access to WIMR's world-class technologies. For example, a new state-of-the-art tool called the Xenium spatial transcriptomics platform, which is a cutting-edge addition to WIMR's research technology, offers the researchers an extremely detailed picture of how the tissue is responding to the adjuvants being tested.

Dr Sandgren and her team are very grateful for funding from the Peter Weiss Foundation, which continues to be vital to the successful progress of this project.

*Continued from page 6*

## The future of vaccines

**This adjuvant research has the potential to be applied to several other vaccines.**

"We are thinking about how adjuvants can help mRNA vaccines, like the COVID vaccines, to induce longer-lasting immune responses, and reduce the need for frequent boosters.

"Research in the mRNA field is expanding rapidly to protect us against all sorts of infectious diseases, and looking at ways it can be used to induce certain pathways in cells to combat cancer."

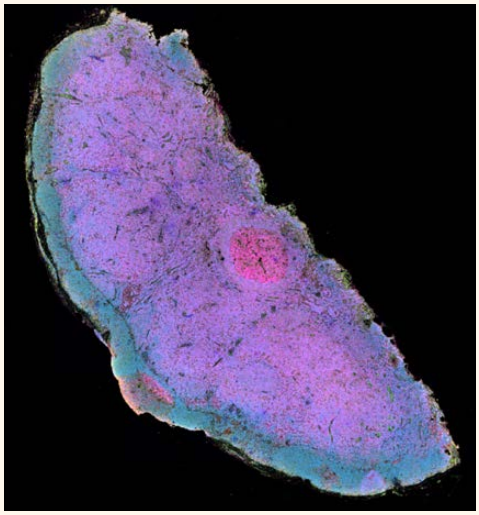
## Researchers outside the lab

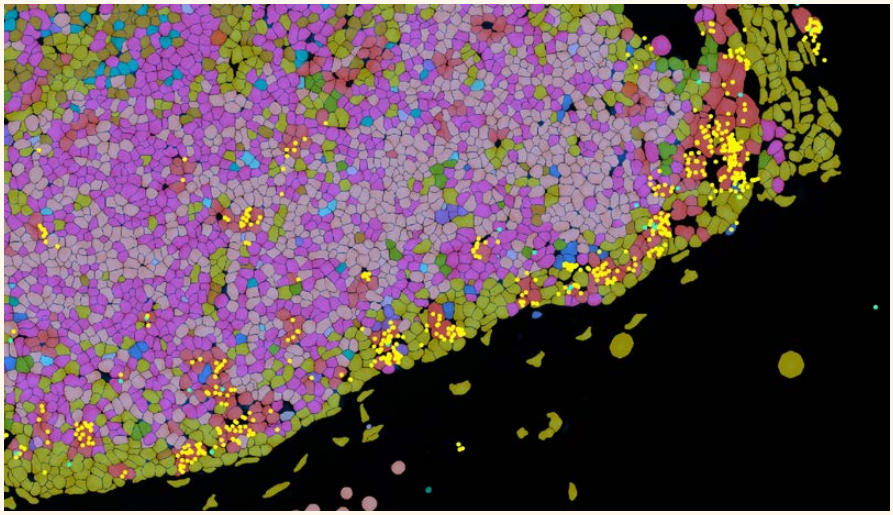
Science is a serious, and sometimes stressful business, and it's important for researchers to maintain a good work/life balance. Away from the lab, Dr Sandgren's life revolves around her three children, all of whom love dancing, gymnastics and physical culture.

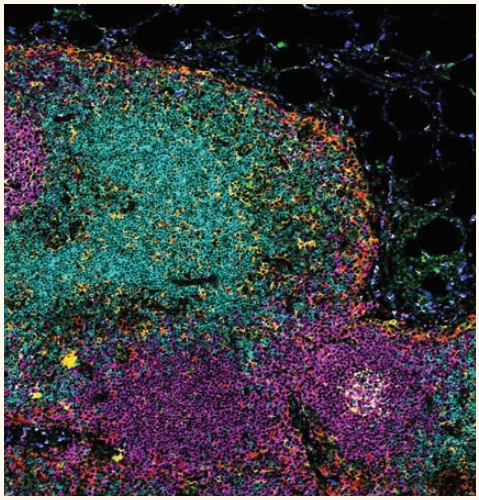
Dr Sandgren explains, "This week I will be attending my eighth, ninth, and tenth concert for the month. I literally go from work to a practice of some description, or a show or some performance that they're in and I love it."

Dr Sandgren has also participated in physical culture, or "physie" as it is known, since she was a child, and recently won a medal competing for the Como Physie Club.

"I go along, and I see people that I've been friends with since I was five years old. We have a great laugh and it's very life affirming."







**ABOVE:** Xenium

(L) A human lymph node imaged on the Xenium Spatial Transcriptomics Platform.

(R) Genes expressed in response to a vaccine, in this case an inflammatory protein called interleukin-1β (yellow dots) can be visualised in individual cells to build up a detailed picture of how the immune cells respond to a vaccine.

*These images were taken by Dr Van Anh Vo and PhD student Sifan Zhang.*

**LEFT:** The intricate structure of a lymph node is revealed by Imaging Mass Cytometry. This is an image of part of a human lymph node. Each type of immune cell is shown in a different colour and all act in concert to produce an immune response.

*This image was taken by PhD student Elizabeth Dunn.*

# Spotlight On Philanthropic Impact: WIMR'S New Senior Philanthropy Manager, Kim Hill, Interviews Long Term Major Donor John Sheather, The Director Of The Neil & Norma Hill Foundation.

When I joined WIMR, what really stood out to me is the calibre of research here, world-leading work with real potential to transform lives. Equally inspiring is the way philanthropy fuels that research. Donors aren't just giving money; they're directly accelerating discoveries that can change how we prevent, treat and one day cure diseases. One of the first donors I was lucky enough to meet was John Sheather, who is the Director of the Neil & Norma Hill Foundation, a wonderful coincidence with the same name but no relation!

James Grellman and John Sheather from the Neil & Norma Hill Foundation

**KH:** The Neil & Norma Hill Foundation has been supporting WIMR for many years. Can you share what has motivated you to continue your support over time?

**JS:** I was drawn to supporting WIMR because of its diverse range of medical research activities led by a totally dedicated team. I say team because I have seen first-hand how researchers will 'cross support' each other's work maximising productivity. Other reasons are WIMR being located in Western Sydney, its excellent relationships with CMRI, Children's Hospital and Westmead Hospital etc.

A few words I think summarise the researchers and support team....Clever, humble, dedicated, genuine, determined and grateful.

**KH:** Are there any particular areas of medical research at WIMR that you feel especially connected to, and why do they resonate with you?

**JS:** Asthma, Alzheimer's, Macular Degeneration, Glaucoma, Crohn's disease, Heart Disease and Sleep Apnoea are areas that have impacted family and friends. It is heartening that WIMR has expert researchers in these areas as both Norma and Neil suffered from Alzheimer's in later life, Norma also suffered greatly from Macular defects. I am proud to have meaningful relationships with all the researchers we support.

**KH:** Looking back, what impact do you feel your support has made?

**JS:** Hill Foundation 'seed funding model' was instrumental in gaining a $1.5 million grant for Professor Andrew Harman's Crohn's research.

Sponsorship of Dr Olaitan (Ola) Temitope Ogunbodede (WIMR researcher and now Doctor at Blacktown Hospital). Dr Ola was awarded 2023 International Student of the Year Higher Education for research on the immune system's role in complex diseases.

Not to mention, many and various publications attributed to the Neil & Norma Foundation.

**KH:** What has been the most meaningful for you in your relationship with WIMR, whether that's meeting researchers, hearing patient stories, or seeing discoveries made?

**JS:** The genuine relationships I have made with the researchers and staff have been incredible, so very rewarding for me. I take a very keen interest in the people we support; I follow their work and applaud success and, more importantly, embrace failure. I believe failure is a necessary step towards great success (at least we know what doesn't work)!

**KH:** What would you say to someone who is considering becoming a donor to WIMR? Why do you believe this kind of philanthropy matters?

**JS:** There is a saying 'money doesn't make you happy', well I can tell you that's totally wrong! All you have to do is give it away and you will feel happier than ever.

Philanthropy bridges the gap between what's possible and what's achievable right now. Government grants are vital, but competitive and can be hard to come by in the early to mid-career stage for a researcher. Donor support like that of the Neil & Norma Hill Foundation gives our researchers the freedom to innovate, whether it's pioneering immunotherapy for cancer, advancing treatments for heart disease, or finding new ways to tackle chronic illnesses that affect millions. It often provides a platform that will then elevate the researcher to get the big grant which takes them to the next level and ultimately make a difference to lives of many people for generations to come.

**If you feel inspired to learn more about how you could make a difference to our life changing research, please contact Kim:**
**E-mail: Kim.Hill@WIMR.org.au**
**Telephone: +61 2 9843 9070**

# This Was Alena's Promise to You

**Alena was born in Scotland and immigrated to Australia with her parents and brother. From a young age, her compassion and determination were clear. She pursued her dream of becoming a veterinarian and later earned a Master's in Public Health. Her life was guided by a deep commitment to current affairs, social justice, and the rights of both animals and humans.**

Alena was extraordinarily multi-talented. She had a gift for the arts, a beautiful singing voice, and natural athleticismm – especially in long-distance cycling and hiking. Her brilliance behind the camera took her across the world, capturing breathtaking images that reflected her unique perspective on life and nature.

One day, while boxing – a sport she enjoyed – Alena found herself out of breath. Concerned, she visited the hospital, where she received the devastating diagnosis of stage four ovarian cancer, which had already spread to her lungs. At the time, she had been physically and emotionally exhausted from caring for her elderly parents and preparing their home, unknowingly overlooking the signs of her illness.

With immense courage, Alena began intensive treatment. Her cancer, caused by a rare genetic mutation, offered limited options, but her strength and perseverance never wavered. She faced each challenge with a determination that inspired everyone around her.

The emotional weight of this journey was profound, especially during the isolating months of the COVID-19 lockdowns. Yet, Alena was never truly alone. Extraordinary friends and neighbours surrounded her life – many of whom were doctors, veterinarians, and mental health professionals. They formed a close-knit circle that cared for her with unwavering love and dedication.

True to her nature, Alena remained in control throughout. Her intelligence, resilience, and deep sense of grace were present every step of the way. Even in illness, she uplifted others, giving so much of herself despite her own suffering.

After a two-year battle, Alena passed away peacefully at her beloved home. Her radiant smile, infectious laugh, and beautiful spirit leave an enduring mark on everyone who knew her.

**Her legacy lives on not only in the hearts of those who loved her, but also through her generous gift to The Westmead Institute for Medical Research. This was Alena's promise – that even in her absence, she would continue to help others, ensuring that advances in ovarian cancer research bring hope and better treatments to those who follow.**

Alena's courage and her love for others will live on through her generous gift.

**Every legacy, no matter the size, is a seed of change that will continue to grow for generations. Will your legacy shape the future of health?**

For more information about leaving a gift in your Will to WIMR, please contact Veena Singh at WIMR on 02 9843 9377 or email veena.singh@wimr.org.au.

**Learn more:**
**wimr.org.au/make-a-gift-in-your-will**

# WIMR Out and About

## Honouring our Discovery Partners

The Annual WIMR Discovery Partners High Tea was a heartfelt celebration of those who have pledged a gift in their Will to support the future of medical research at WIMR. We also celebrated our Community Partners, donors and volunteers who raise awareness and vital funds for causes close to their hearts.

Guests heard from Associate Professor Stephen Milne who presented his pioneering lung disease research from WIMR's Ludwig Engel Centre for Respiratory Research.

## Technology accelerates discovery

Representatives from the ACMA Charitable Trust, The Wayin Network, and the Australian Chinese Jockey Club visited WIMR to receive updates from Scientific Platforms staff. Dr Maggie Wang and Suat Dervish described how various technologies enable researchers to advance their work. Thank you for your ongoing support!

## Karaoke fun to help fund diabetes research

In May, the Australian Chinese Medical Charitable Trust organised a Karaoke night in support of Professor Jenny Gunton, Centre Director of Diabetes, Obesity and Endocrinology Research at WIMR. The event successfully combined enjoyment with fundraising, generating essential support for research aimed at improving the lives of individuals living with diabetes. We sincerely appreciate the continued generosity of this group.

## Another successful year for the WIMR Walk – thanks to the incredible support of Coleman Greig Lawyers

For the third year running, our valued corporate partner, Coleman Greig Lawyers, has gone above and beyond in its support of the annual WIMR Walk.

A vibrant launch event, saw staff gather to learn more about WIMR's groundbreaking work. Senior Research Assistant, Stephanie Lynch, was invited to speak about the promising advances in Phage therapy and the urgent issue of antibiotic resistance.

To celebrate their steps and fundraising efforts, Coleman Greig Lawyers hosted a fantastic finale event at Parramatta Park. Thank you to the staff and supporters!

## Full steam ahead for MS Research: Galston500 breaks records in 2025

We were excited to be part of another incredible annual event hosted by the Hornsby Model Engineers at the Galston500 this August. The event once again drew strong support from all corners including club members, local families, and a wonderful turnout from local, state, and federal representatives.

The commitment of the Club members was on full display as they tirelessly completed 500 laps – an extraordinary effort to raise vital funds for the Multiple Sclerosis research team at WIMR, led by Dr Grant Parnell. Grant and his team thoroughly enjoyed the day, and as always, Grant couldn't resist jumping behind the controls for the final lap – a much-loved tradition!

Thanks to the generosity and hard work of everyone involved, with a special thank you to Allie Thackray, whose passion and dedication are truly the backbone of this event each year.

## A wonderful day on the green in support of life-changing research

Our incredible supporters, Abal Banking, once again hosted a spectacular Golf Day at the impressive Luddenham Golf Club, bringing together generosity, good company, and a shared commitment to advancing heart research whilst raising vital funds for Professor Eddy Kizana and WIMR's Centre for Heart Research.

We are truly grateful for the unwavering generosity and the passion of Abal Banking in support of our life changing research, thanks to Raghida Younes and the team for organising this fabulous event.


## Breakthrough Meet the Researcher Seminar and morning tea

Guests had the opportunity to listen to Associate Professor Joanne Reed who is the Principal Research Fellow and head of the Autoimmunity and Amyloidosis Laboratory at WIMR. Joanne and her team's current research focuses on using genomics to improve the prognosis and treatment of autoimmune and amyloid diseases. This event coincided with Include a Charity Week, a movement transforming lives through the power of legacy giving. Thanks also to Erin Dawson from our Honorary Solicitor Coleman Grieg Lawyers for speaking on the importance of Estate Planning.

# 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/donate**

## Easy ways to donate

### You can make a donation in any of the following ways:

- **Cheque** – Enclose a cheque in an envelope payable to The Westmead Institute for Medical Research Foundation, add your contact details, and post to us at:

  The Westmead Institute for
  Medical Research Foundation
  PO Box 412
  Westmead NSW 2145 Australia

- **Online** – Scan the QR Code above or visit wimr.org.au/donate and make a secure credit card donation.
- **Direct Payment** – Make a direct payment from your bank account to:

  Account Name: The Westmead Institute for Medical Research Foundation
  BSB: 032-278
  Account: 76 76 16

- **Phone** – Simply call one of our Foundation team members on (02) 9843 9000 and we'll be happy to assist you.

Donations of $2 or more are tax deductible.
ABN 90 141 847 634

### Thinking about your legacy?

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

We encourage you to first discuss your wishes with your loved ones, and to consult a solicitor when making or updating your Will to ensure it is legally binding and truly reflects your intentions. If you don't have a solicitor, we can connect you with one of our Honorary Solicitors, who would be pleased to assist you.

**For a confidential discussion, please contact:**

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