The Westmead Institute
FOR MEDICAL RESEARCH

ISSUE 8 AUTUMN/WINTER 2024

DISCOVERY

Message from the Executive Director

One of WIMR's greatest strengths is the exceptional people who drive our research discoveries and it is pleasing to see our younger scientists achieve significant research milestones after many years of hard work. Their enthusiasm, commitment, drive and innovation is what brings so much satisfaction to the more hardened veterans in the institution. They are the future of the Australian healthcare system and it is reassuring to know that our future is in such good hands.

Twenty years ago, in my specialist field of nephrology (kidneys), there were very few people over 65 on dialysis. Only half of the patients who received a transplant survived long-term, and there was only one choice of anti-rejection drugs, which came with considerable side effects. Surgical complications were a lot higher and patients often died of infection.

Now, we have better anti-rejection drugs, better surgical outcomes and post-operative care, and much better treatment for severe infections, especially viral infections. This did not happen by chance. It was medical research, carried out by many institutions and research teams that led to the remarkable outcomes we have today.

Outstanding research at Westmead has meant that we now understand what happens through the lifetime of a transplant and why it can go wrong.

Two decades of research at Westmead, defining the long-term outcomes of a transplant, has led to a paradigm shift in our understanding of transplant rejection. It has spurred new clinical trials, changed anti-rejection protocols, and dramatically improved treatment outcomes for our patients, often adding years to their lives.

This is happening across all fields.

At WIMR, we are undertaking world leading research in genomics and AI in order to achieve more personalised treatments through Precision Medicine. These extremely targeted and effective approaches are only possible because of all the research that was undertaken in the past. In research terms, we are standing on the shoulder of giants. We now have a once in a generation opportunity to rapidly accelerate progress to new treatments and cures for many of the most challenging diseases.

WIMR researchers have had some big wins this year, including several NHMRC and MRFF grant awards. On behalf of this great organisation, I congratulate all of them and applaud their success. I'm sure, as you read about their pioneering work in the following pages, you too will share my pride.

Community involvement is vital to our success at WIMR and we are deeply grateful to all of our supporters. I thank you sincerely for your contribution and all you do to encourage progress. Together we are saving lives and bringing hope through science.

Professor Philip O'Connell
WIMR Executive Director

Cover Image

3D rendered image of bacteriophage.

Funding and awards

$4.9 million in NHMRC Ideas Grant funding to WIMR researchers

WIMR researchers have recently been recognised with significant funding, acknowledging the calibre of our pioneering work and world-class research teams.

$4.9 million in National Health and Medical Research Council (NHMRC) Ideas Grant funding was awarded to WIMR researchers, helping them to continue investigations into treatments, preventions and cures for some of the biggest disease challenges of our time.

Congratulations to:

- Dr Jennifer Li who received funding for her work to advance precision medicine in renal transplantation;
- Dr Najla Nasr whose funding will help to develop therapeutic strategies in the fight against HIV;
- Professor Andrew Harman and Professor Scott Byrne who received funding to help them define the role of antigen presenting cells in Crohn's Disease;
- Associate Professor Guoping Zheng whose work aims to prevent kidney failure in chronic kidney disease;
- Associate Professor Aaron Schindeler whose funding will help him continue to explore gene therapy for Neurofibromatosis types 1 and 2.

NHMRC grants are highly competitive, with only a select number of innovative projects funded in each round. WIMR's success rate this year is far above the national average, highlighting the regard held for WIMR's researchers and their work.

WIMR-led research receives MRFF Grant

A groundbreaking research project, led by WIMR Executive Director, Professor Philip O'Connell, has been awarded a Medical Research Future Fund (MRFF) Genomics Health Futures Mission grant of close to $2.5 million over four years.

The Genomics Health Futures Mission is investing $500 million in genomic research. It will improve testing and diagnosis for many diseases, help personalise treatment options to better target and improve health outcomes and reduce unnecessary interventions and health costs.

This WIMR-led project aims to develop and validate a risk score for kidney transplantation. Incorporated at the time of transplantation, the risk score could identify patients at risk of acute rejection (AR) and long-term graft loss.

WIMR in the news

Funding and awards

$2.6 million NHMRC Investigator Grant awarded to Associate Professor Joanne Reed

Our new Centre Director for Immunology and Allergy Research, Associate Professor Joanne Reed, has been awarded a $2.6 million Investigator Grant from the National Health and Medical Research Council (NHMRC).

NHMRC Investigator Grants support research across the four pillars of health and medical research: biomedical, clinical, public health and health services, and researchers at all career stages. The scheme aims to allow flexibility for researchers to pursue important new research directions, to form collaborations, and foster innovative and creative research.

Associate Professor Reed's successful project aims to use genomics to transform the diagnosis and treatment of autoimmune disease.

Professor Wayne Hawthorne

New research funding to make life-saving treatment a reality for more type 1 diabetics

WIMR's Professor Wayne Hawthorne and his team recently received a grant for $3.5 million over three years from JDRF, the leading supporter of type 1 diabetes (T1D) research globally.

This vital funding will allow Professor Hawthorne to continue his groundbreaking pancreatic islet transplantation research, with the aim of making this treatment available to more people suffering from T1D in Australia, and around the world.

WIMR research student wins prestigious Fulbright Future Scholarship

Harry Robertson, a research student and aspiring bioinformatician studying at WIMR, has been awarded a Fulbright Future Scholarship (Postgraduate) hosted by Harvard University. This scholarship allows Harry to advance his research at Harvard University.

Harry's Fulbright study is focused on discovering biomarkers for organ transplant health through advanced imaging. Traditional biomarkers rely on costly sequencing, often inaccessible to many. By pioneering new machine learning methods to analyse this imaging data, Harry aims to offer a universally available, non-invasive diagnostic tool for transplant recipients.

World first: AI-based test to predict life-threatening bacterial infections in COVID-19 patients

WIMR researchers have developed a world first test which aims to identify which COVID-19 patients will need urgent, lifesaving medical treatment.

The test needs a few drops of blood to predict, with near-perfect accuracy, which COVID-19 patients will develop potentially deadly secondary bacterial infections, such as pneumonia.

Another step closer to a breakthrough treatment for heart damage

Professor James Chong and his team in WIMR's Centre for Heart Research are pioneering a game-changing new treatment for heart failure. They're using specially cultivated stem cells to grow new heart muscle that could be injected directly into the heart to regenerate an area damaged when someone suffers a heart attack.

In an exciting development, they have now proven that already available drugs can be used to ensure that the newly injected cells beat in time with the heart they're delivered into. This is a vital step that is a critical component of success for the new treatment strategy.

There is more work to be completed in the laboratory, but with research now well advanced this new heart regeneration treatment could progress to clinical trials in just two to three years. Professor Chong and his team are pleased that their drug discovery takes them one step closer to trials commencing, and, ultimately, their heart regeneration therapy becoming available to all those who need it.

Did you know?

1 in 5 Australians will experience mental health issues this year

1 in every 20 people are living with a diabetes diagnosis

1 in 50 people in Australia will suffer with cancer each year

The **WIMR WALK** to save lives will shine a light again on health and wellbeing encouraging us all to get out and improve our own health simply by taking a walk. Walk with a friend, a colleague or your family. Walk around the street, in your lunch hour, take the dog for a walk in your local park, go for a bush walk or along the coast - it's up to you!

You will not only be helping to improve your health but the health of people around the world!

Funds raised will help to accelerate the work WIMR Researchers do in their quest to discover new treatments, diagnostic tools and cures for some of the most prevalent diseases of our time.

We hope you will join us!

Join us this June

For the WIMR WALK to save lives

Scan the QR code to join us

The Rise of Superbugs: using phage therapy as a promising solution.

By WIMR's Adjunct Professor Ruby Lin and Professor Jon Iredell

Our reliance on antibiotics is facing a significant challenge. Antimicrobial resistance (AMR), commonly known as the rise of "superbugs," has become a pressing global concern. Scientists are exploring phage therapy as an intriguing solution.

As seen on the recent SBS documentary, "Last Chance to Save a Life", which showcased one of the patients we treated at the Westmead Health Precinct, we take this opportunity to describe our ongoing efforts to harness the power of phage therapy in the battle against antibiotic resistance.

Antimicrobial resistance occurs when bacteria develop the ability to resist drugs that were once effective in treating them. This renders traditional antibiotics less effective, and in some cases, completely ineffective. It's a global health concern because common infections can become life-threatening without effective treatment options.

Bacteriophages, or phages for short, are viruses that specifically target and infect bacteria. They can be thought of as "natural predators" of bacteria. In phage therapy, we isolate specific phages that can infect and kill the targeted bacteria. These phages multiply and destroy the bacteria, effectively eliminating the infection.

Phage constantly evolve alongside bacteria, continually adapting to outsmart them. This makes them a potential long-term solution against evolving and resistant bacteria.

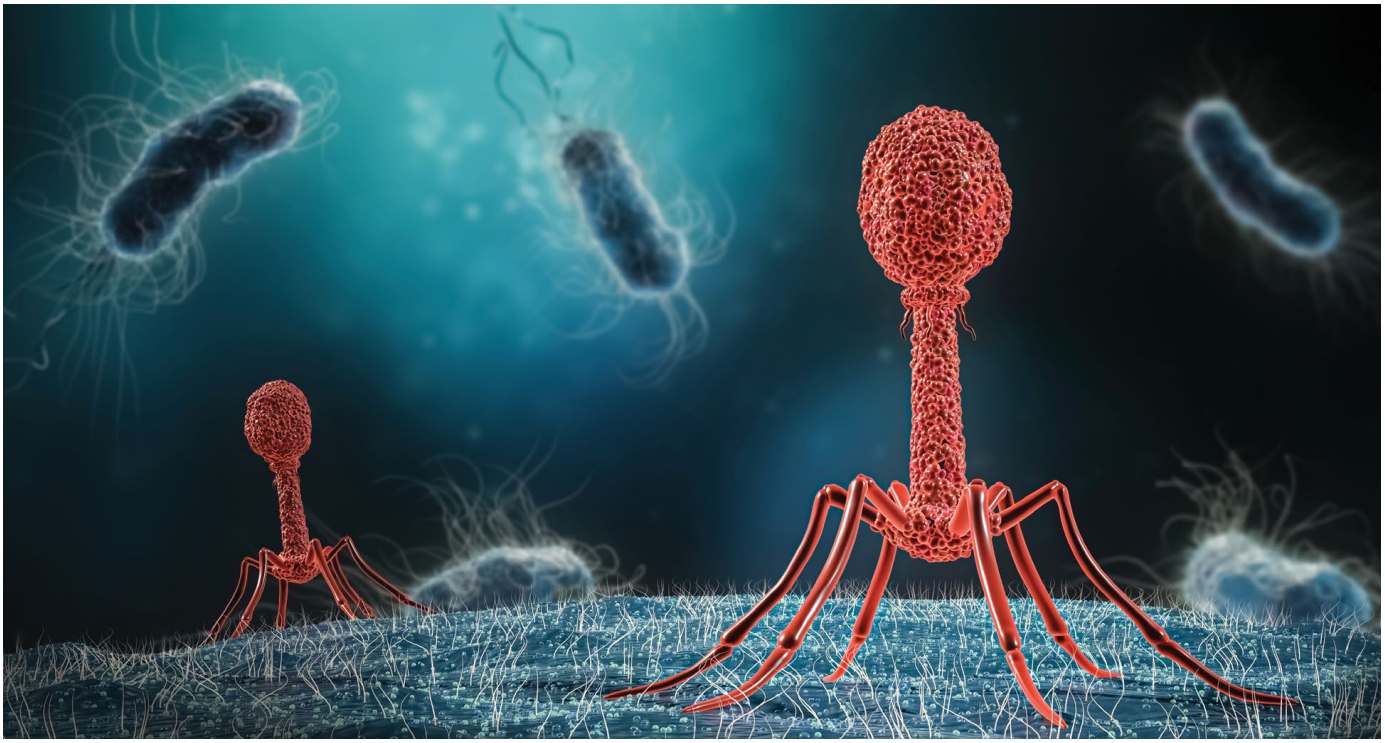
The remarkable precision of phages in targeting specific bacteria is an incredibly efficient approach for developing personalised therapies within the realm of precision medicine.

Phage therapy has been used for more than a century, in some countries, particularly in Eastern Europe, to treat bacterial infections.

More recently, there have been successful cases of phage therapy being used to combat drug-resistant infections, such as those caused by superbugs like MRSA (Methicillin-resistant Staphylococcus aureus). Research is ongoing, and clinical trials are being conducted to further explore its potential.

Like all advanced therapies, phage therapy faces its own set of challenges.

The process of matching the appropriate phages to target specific bacteria can be intricate. Moreover, regulatory processes and ensuring the safety and



Phage Infecting bacteria

effectiveness of phage products require further focus. At the Westmead Health Precinct, we are actively addressing these challenges.

We co-founded Phage Australia with the goal of seamless integration of phage therapy into clinical services. This visionary initiative unites clinicians, infectious diseases physicians, phage biologists, researchers, scientists, and regulatory and biomanufacturing experts from both national and international domains. Through this collaborative effort, we are actively propelling the progress of phage therapy as a prospective clinical service within the public sector.

Since December 2021, patients in Australia have gained access to bacteriophage therapy through the Therapeutic Goods Administration (TGA) Special Access Scheme, with a permissive and supportive stance from the TGA. This pathway enables patients to receive this innovative treatment under the standardised treatment and monitoring protocol known as STAMP (Standardised Treatment and Monitoring Protocol). This significant development has opened doors for patients to benefit from phage therapy with the necessary oversight and support from regulatory authorities.

WIMR's phage therapy program so far

Prior to STAMP, between 2017 and 2021, at Westmead, we treated 19 patients (16 adult and three paediatric patients).

Since national approval of the STAMP protocol in December 2021, and at the time of publication, we have received 82 requests for phage susceptibility testing, and 15 patients have been treated.

Of the 15 enrolled patients (9 male, 6 female; aged 8-81 years), infections were found in various sites, including bone/joint, pulmonary, sinus, endovascular, urinary tract, intra-abdominal, and disseminated.

Under STAMP, a total of 23 batches of fourteen phages were used, either individually or in combination, after conducting phage susceptibility tests. These phage preparations were administered through different routes, including intravenous, topical/instillations, nebulised, and oral.

> **We are proud to say that 93% of patients had their phage preparations produced at WIMR.**

Clinical responses to the treatment varied with most patients (73%) experiencing clinical responses ranging from clinical cure to partial improvement two weeks after phage therapy. In some cases, phage neutralisation activity in the patients' serum was

Phage Australia team

detected, indicating the presence of antibodies against the phages. We are delighted to say that no serious adverse events related to the treatment occurred.

In Australia, we have achieved a significant milestone by treating a cohort of 34 patients using phage therapy, which marks the highest number of patients treated to date. This accomplishment underscores our commitment to advancing the field of phage therapy and providing innovative treatment options to patients in need. The utilisation of the STAMP protocol has further enhanced the standardisation and monitoring of these therapeutic interventions, ensuring optimal patient care.

This progress in phage therapy highlights its potential as an alternative approach to combatting antimicrobial resistance and treating difficult-to-treat infections. Ongoing research and clinical experiences will continue to shed light on the safety, efficacy, and broader applications of phage therapy in the future.

> **Addressing antimicrobial resistance is an urgent global concern, and it is imperative that we explore alternative solutions such as phage therapy. Advancing our knowledge of phages and their potential applications is crucial for developing effective treatments against highly resistant bacterial strains.**

> **Staying abreast of the latest scientific advancements and providing support to research endeavours are pivotal in shaping the future of medical interventions. We express sincere appreciation to our funders and donors for their invaluable contributions to this scientific pursuit (NSW Health, OHMR, MRFF Frontiers grant, Hopper Shaw Foundation).**

Heart-felt thanks for a life saved

Akeke Kavana attending WIMR Annual Golf Day 2023

One Spring evening in 2014, Akeke Kavana left home, as usual, to go to work. By the next afternoon, Akeke was in a life-threatening condition in Westmead Hospital, under the dedicated care of Professor James Chong.

Akeke is a crane driver in the construction industry and was working long nights. It was during one such night when Akeke says he started to feel pain in his chest.

"It was very painful, but I continued working and finished up at about 5am. I drove home and, usually I would then drive my partner to work, but this day, I was in too much pain to drive her.

"I tried to sleep, and then I went to see my GP. She did some tests and said she would call me with the results. She sent me home, but later in the afternoon she called and told me to go straight to hospital because I was having a heart attack.

"When I arrived, they rushed me straight in. I was in hospital for a couple of days before they put in two stents. That was a very weird experience because I was awake during the procedure, and able to watch what they were doing on the monitor."

Akeke responded well, and only one week later, he was back at work. Not long after, he was also back playing golf, a pastime he loves.

Akeke admits that, even after the heart attack, he was leading a hectic lifestyle. He wonders if this may have contributed to what happened next.

On a hot January day in 2019, Akeke had just finished working another long shift driving cranes.

He explains, "I got home and I was in the kitchen and had just put the jug on to boil when I suddenly collapsed."

Akeke was having a stroke. An ambulance rushed him to hospital, and he was there for six weeks.

"This was a very confronting time for me. In the beginning, I wasn't allowed to sit up – I had to stay flat. I couldn't speak for a while, and that was scary and frustrating. My partner tried to explain everything to me and keep me calm.

"In hospital, I kept asking myself, "Why me?" I do think my lifestyle played a part. Some days, I was living on four hours sleep. After a 10-minute nap, I felt like I could go another 24 hours. I felt like Superman. So, when I was in hospital, I kept saying to myself, "You stupid boy!"

Though he was quickly back to work and normal life after the heart attack, recovering from the stroke took longer. It was seven months before Akeke got his car licence again and was able to get to the golf club to play golf, and 10 months before he was allowed to get his construction licences again so that he could return to work.

Further tragedy followed when Akeke's beloved partner passed away from a heart condition a year and half a after his stroke. She was only 52.

Akeke says that, after her death, there was a period where he struggled to find a reason to live.

"I wanted to live, but it was hard."

"A year and a half later, my life changed again when my grandson was born. Now, at 61, I've found a new lease on life. Now I want to live until I'm 100!"

Together, these events have changed Akeke's outlook on life.

"Now, I'm always telling my family and friends to look after themselves, especially the young ones. I've changed what I eat. I don't drink soft drinks or alcohol anymore, and I try to avoid ice cream and cake (although that is hard). In hospital they also told me not to drink cold water. So, I've trained myself to only drink warm water."

Akeke still sees Professor James Chong regularly for check-ups. One evening, while watching the nightly news, Akeke was happily surprised to see Professor Chong on television.

Professor James Chong is Co-Director of WIMR's Centre for Heart Research and Head of WIMR's Cardiac Regeneration Laboratory, as well as being an interventional cardiologist at Sydney's Westmead Hospital. When Akeke saw Professor Chong on the television, he was being interviewed about his research at WIMR, where he is developing new and more effective treatments for repairing and regenerating the heart.

"I saw James on the television talking about his research and I was excited to see my cardiologist on TV. I remember hearing about his research and its potential to help patients, and thinking, "Pick me James!" It was very exciting.

> **"I am incredibly grateful to Professor Chong, and I'm astounded by his talent and dedication to work as a cardiologist and as a researcher. How many people can go inside the body and manipulate an organ like the heart? It's incredible. He is so smart!"**

Henry and Inge's inspiring legacy

Henry and Inge Heinl's story is a testament to the power of resilience, hard work, and the pursuit of a better life. Henry and Inge emigrated from Germany to Melbourne in 1955 with their young family, Hellmut aged 4, and 18-month-old Angela with just 20 Pounds to their name. Henry had been a Master Pastrycook in Germany, so they quickly set out to create a good life for their family in their new home. From these modest beginnings they built Melbourne's beloved cake shop chain, "Henry's Cakes".

Life, however, presented its share of challenges. Daughter Angela received a diagnosis of endometrial/ovarian cancer at the young age of 31. With treatment she returned to good health but, sadly, her beloved brother Helmutt succumbed to liver cancer at only 60. These experiences influenced Henry's decision to support cancer research through a gift in his Will.

After researching various medical research institutes around Australia, Angela made the decision, as Executor, to direct this gift to WIMR. Angela explained, "During my research I found that WIMR is a leader in ovarian and liver cancer research. I know my father would have been very pleased to contribute directly to research in the areas which had so much impact on our family."

We extend our deepest gratitude to Henry and Inge and their family for their generous spirit and desire to help other families touched by cancer.

Arrival to Australia circa 1956

From L: Angela Heard, Inge Heinl, Heinrich (Henry) Heinl and Helmutt Heinl

Thinking about your legacy?

WIMR Partners with "Gathered Here" online wills platform

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

We are very grateful to those who are considering leaving a gift in their Will to the WIMR Foundation and we welcome the opportunity to discuss your legacy further.

For a confidential discussion, please email Hilary May Black, WIMR's Gifts in Wills Manager, or give her a call on (02) 8627 3027.

WIMR out and about

Over the last few months WIMR has been busy hosting events to help familiarise people with the work we do, friend raise and fundraise to support our research. Here are some of the highlights. If you would like to hold a fundraising event, please contact Diane Humphries at diane.humphries@wimr.org.au

We would love to hear from you!

Welcoming Community Members to WIMR

We're always delighted to welcome members of community organisations and service clubs here at WIMR. Members of Parramatta Rotary (pictured here) recently enjoyed a tour of WIMR with a presentation by Professor Natasha Rogers, Deputy Director of WIMR's Centre for Transplant and Renal Research, a tour of WIMR's laboratories and afternoon tea with the researchers. For more information about club tours contact: Hilary May Black on hilary.mayblack@wimr.org.au or (02) 8627 3027.

WIMR Showcase Luncheon

Professor Natasha Rogers and Dr Isabella Breukelaar spoke at a fabulous luncheon hosted by a generous family of committed WIMR supporters. They highlighted the opportunities and challenges faced by female researchers.

WIMR Annual Golf Day

Ray Hadley, Professor James Chong and Akeke Kavana

In November, our WIMR Annual Golf Day at Castle Hill Country Club was a resounding success.

Following a fun day of golf, the evening event was hosted by Ray Hadley, who also served as the auctioneer, keeping everyone entertained.

Guests heard from Professor James Chong and his patient Akeke Kavana about the lifechanging breakthroughs on the horizon and the potential of stem cells to rejuvenate a damaged heart.

Save the date for our next Golf Day! Mark your calendars for Tuesday, 26 November 2024!

Racing for Research at Royal Randwick

In February, our inaugural Racing for Research at Royal Randwick event was a tremendous hit.

Attendees enjoyed a delightful three-course lunch while mingling with friends and gaining insights into our pioneering work in breast cancer and phage therapy. Fashions on the Field added some fun to the day with two lucky winners taking home some great prizes.

Business event

In February we welcomed Raman Bhalla, the President of Sydney Investors, Professionals and Business Networking Group Incorporated (SIPBN), alongside his fellow Directors and their lively membership group. Professor Jacob George, Director of WIMR's Storr Liver Centre, took centre stage, delivering an eye-opening talk on liver disease. SIPBN's monthly pitch session followed, with young innovators and entrepreneurs presenting their game-changing ideas to a captivated audience of potential investors. The business concepts were diverse, and the presentations were highly professional, eliciting a lot of interest on the night.


Melanie Mac WIMR PhD Student

WIMR PhD Students training the budding scientists of tomorrow

WIMR Foundation has been involved with The King's School again this term with PhD student researcher Gaitan Njiomegnie working with The Future Project and students enjoying a tour and presentation by Professor Eddy Kizana on heart health. In addition, a presentation by PhD student Melanie Mach at the Prep School saw students looking through microscopes and using pipettes to learn about basic science procedures in a lab.

"We are deeply grateful at the Prep School for the opportunities the students were provided for learning about active scientific research occurring with leading specialists in the fields. Building positive, practical scientific experiences such as these will have enduring impact on their interest in science," Mr Peter Allison Head of Preparatory School said.

ABAL Bank

Thanks go to Abal Bank who held their annual Golf Day at Twins Creek Golf & Country Club Luddenham in November, in support of the Centre for Heart Research. Guests enjoyed a round of golf followed by lunch and a presentation from Associate Professor Eddy Kizana discussing his innovative approach to gene therapies for heart disease as an alternative to pacemakers.

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**

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Name: _____

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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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PO Box 412
Westmead NSW 2145
Australia

Ph: 02 8627 3000
Website: wimr.org.au
ABN 90 141 847 634

To find out how your support can make a difference, contact the WIMR Foundation team at 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.

Contact our Gifts in Wills Manager on (02) 8627 3027
Email: hilary.mayblack@wimr.org.au