

The  
Westmead  
Institute

FOR MEDICAL RESEARCH

ISSUE 5    SUMMER 2022

# DISCOVERY



# Message from the Executive Director

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Precision Medicine is the way of the future and The Westmead Institute for Medical Research (WIMR) is a leading institution embedding the concept into medical research.

Precision medicine is the combination of genetic, clinical, and other forms of data to select the best treatment option for each individual patient. At WIMR, we like to say it is a shift from treating disease to treating people.

Recently we have set down our vision and our 10-year plan to accelerate progress towards more effective diagnosis and treatment of the major disease challenges of our time by integrating precision medicine into clinical practice.

WIMR has developed world leading expertise in genomics, not only in cancer but also in other disciplines including mental health, immunology, renal medicine, transplantation, liver disease and infectious disease.

The aim is to link genomic, clinical, and environmental data with the social determinants of disease, in order to develop new disease taxonomies and new treatments.

The challenge over the next decade is to invest in the people with skills in biology, clinical science, clinical trials, genomics, machine learning and artificial intelligence. Our objective is to work collaboratively to integrate a deep understanding of the biology of disease with the mathematics and computational skills required to manipulate large data sets. We can then use this information to develop new innovative clinical trials that will inform clinical practice and medical education into the future.

Already WIMR is utilising these key capabilities. Examples include:

- the INOVATe trial where gene sequencing is used to identify the best treatment options for women with ovarian cancer
- the use of precision diagnostics to select bacteriophages as a treatment for antibiotic resistant bacterial infections
- identifying a person's response to anti-depressant treatments using sophisticated brain mapping from MRI scans
- the use of genomics to select the best treatment for people with rare autoimmune diseases
- the development of predictive diagnostics to identify patients at risk of transplant rejection and graft loss

These types of research breakthroughs don't come by chance. They are the result of hard work by dedicated multi-disciplinary research teams. Everyone at WIMR is deeply committed to pursuing our precision medicine roadmap for the future.

As we shape the breakthroughs that will transform the future of health for generations to come, I encourage you to join us on this exciting journey towards 2030.

**Wishing you good health,  
Professor Philip O'Connell**

## Cover Image

High-powered microscope image of a 3D culture of normal (non-cancerous) breast epithelial cells, stained for various cell type specific markers. 3D cultures are created in the lab to mimic the way cells develop in living tissue. WIMR researchers are comparing how different cell types develop in different conditions, to be able to create tailored precision medicine treatment options for people diagnosed with DCIS breast cancer. Image by honours student Sarah McLucas, from WIMR's Centre for Cancer Research.

# Phage Therapy changes a young life

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Fourteen-year-old Rebecca Palone was one of the first patients in Australia to receive phage therapy developed by the team at the Westmead Institute of Medical Research.

The therapy uses viruses called “phages” that eat deadly bacteria in the body to defend against antibiotic resistance.

“The amazing team, with the help of many people, arranged for the phage to be sent from America to the Westmead Children’s hospital for my daughter, for her to be injected with it every day for 12 months - it takes my breath away” said Rebecca’s mother Trudi. The HITH (Hospital in the Home) team “came to our home, school, my sister’s home and even on Christmas Day. This was an amazing treatment.”



The therapy has become relevant again thanks to Professor Jon Iredell and his team at WIMR. As resistance to antibiotics becomes more prevalent today, phage therapy has become a solution for patients like Rebecca Palone who has suffered from a series of bacterial infections, in addition to cystic fibrosis. Her mum says that phage therapy saved her daughter’s life.





# Shock diagnosis in childhood leads to a passionate search for a cure

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Senior researcher at WIMR's Storr Liver Centre Associate Professor Thomas Tu discusses his passion for research into Hepatitis B, his achievements to date, a very special award, and where to next.

## What drives your research interest in Hepatitis B?

My research story really began when I was 14, when I was diagnosed with Hepatitis B. My family are from Vietnam, where chronic Hepatitis B affects about 20% of the population. In countries with such high levels, people usually get Hep B during birth or from little scratches during childhood if they are not vaccinated.

The positive diagnosis was a shock and upsetting, but at the same time I did not know what it meant. It wasn't something we talked about in my family and I dismissed it and put it in the back of my head.

It did not come back until after high school, when I was sorting out what I wanted to do; I just had no idea. I was thinking psychologist, comedian, being a doctor... seeing as I am not very funny, I ended up picking something in the biomedical field as I could always take up doctoring later.

## How did your scientific and research career develop?

As I progressed, I learnt that the university I was attending (University of Adelaide) had one of the few active Hepatitis B research labs in Australia.

From second year on, I focused on getting into that lab. My diagnosis came back to the forefront of my mind and I saw that I had the potential to change things.

I then finished my PhD, post-doc'd at The Centenary Institute, then a famous Hep B lab in Heidelberg, Germany. Hep B was always in my sights.

I made the move from Germany to WIMR specifically because Westmead Hospital serves the highest number of people with Hep B in Australia. I knew I wanted to help people directly and really to bring back that world-class expertise and build up Australia's Hep B infrastructure.

## What is your research focus now?

Our group focuses on how the virus establishes a chronic infection. If we can find out how the virus stays in the liver, then we can try to make drugs to reverse this and cure the infection. This would be the simplest way to stop the liver disease.

The other focus of our group is how the virus causes cancer. We use novel molecular assays to understand how the particular forms of the virus drive cancer. This work will get us closer to finding out how to prevent liver cancer in people with Hep B. This is important because even if someone is on antiviral treatment, the risk of liver cancer is still there.

## What are you hoping to research in future? What's next?

I want to continue to try to develop a cure for Hepatitis B and stop liver cancer from taking hold in those affected by the disease.

This is a huge issue; a person dies every minute due to Hep B and anything that can decrease that is worthwhile.

The science however is limited in what it can do. We have no cure, and the major thing limiting us is time and resources. We have such passionate, experienced, and smart scientists looking at this; we just need the support to make it happen. We know that funding for research like this is an investment that may take time to mature, but it's an investment well worth making.

## Outside the lab you're also a great advocate for the Hep B community. What are the achievements you're most proud of?

I was recently awarded the NSW Young Tall Poppy Science Award by The Australian Institute of Policy and Science, which recognises the combination of scientific research and communicating that to the greater public. I'm especially proud of this because it brings together both my research work and community advocacy.

I was fed up with the lack of resources and support networks for people with Hep B, so two years ago I started a website myself called HepBcommunity.org. We have scientists and doctors answering people's questions 24/7 as a completely free volunteer service and have now supported more than 1,000 people on the site.

One of our goals now is to spread the awareness of our community and help more people during that vulnerable time, people who have just been diagnosed and seeking

more information, advice, and experience they can trust. And nothing garners trust more than a community of people that you know has been through the same thing as you.

**What's next for you as you keep working towards a cure?**

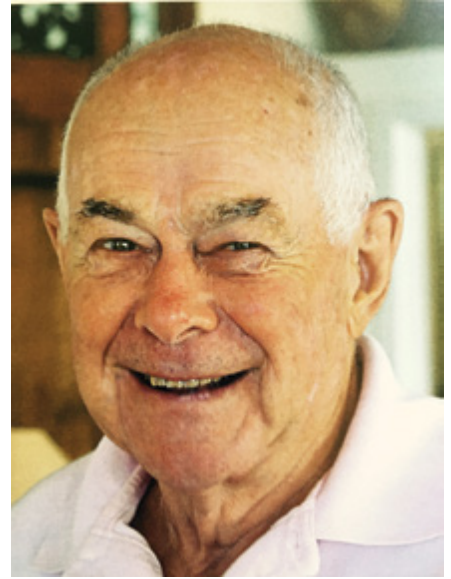
Recently, with others with lived experience of Hepatitis B, I have started Hepatitis B Voices Australia, an independent non-profit which seeks to advocate, support, accurately represent, and amplify the voices of those affected by Hepatitis B. We will focus on furthering the interests of the affected communities in all aspects, including in community health, scientific, clinical, and policy spheres.

We are now partnering with everyone who wants to engage with the affected community and shares our passion for eliminating the impacts of chronic Hepatitis B. Bringing those voices into research and letting them define the most important issues that need to be addressed is key to high impact research and will definitely shape my future directions.





# Presenting The Peter Tosi Fellowship



Amyloidosis is a general term used to describe a diverse group of diseases caused by proteins that accumulate in vital organs, including the heart, kidneys and liver. If untreated, amyloid deposits can cause tissue damage and organ failure and can significantly reduce life expectancy. Across the spectrum of amyloid diseases there is an urgent need for better diagnosis and treatments.

In 2022, The Peter Tosi Fellowship was established in honour of Peter Tosi whose life was sadly cut short by amyloidosis. It has been made possible thanks to generous contributions from Peter's past colleagues and staff at Macquarie Group, The Macquarie Group Foundation, members of the Whale Beach community, the Tosi family and other friends.

After an international recruitment drive, WIMR is proud to announce the appointment of Associate Professor Joanne Reed as The Peter Tosi Fellow.

Associate Professor Reed has established a new research group at WIMR, comprising four early career researchers - a PhD student, a research assistant and two postdoctoral research scientists.

Associate Professor Reed has laid out an ambitious five-year research plan, with two main aims:

1. advancing diagnosis of amyloid diseases; and
2. uncovering disease processes to enable precision medicine-based treatment.

This program will provide new knowledge into why amyloid proteins suddenly develop in previously healthy people and identify strategies to target and reverse the cause of disease. It will enable early intervention, provide an alternative to invasive tissue biopsies, and achieve better outcomes for patients and their families.

With so little known about amyloidosis, this research program is set to transform the way the disease is diagnosed and treated.

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**The Peter Tosi Fellowship represents a significant opportunity to advance our understanding of, and pursue a cure for, a complex disease. WIMR researchers have achieved several Australian and World Firsts, and we are deeply proud to now welcome The Peter Tosi Fellow Associate Professor Joanne Reed into our fold. We look forward to celebrating Jo's achievements and successes over the years ahead. Our most sincere thanks go out to the visionary individuals whose generosity and support has made The Peter Tosi Fellowship a reality.**

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– Professor Philip O'Connell,  
Executive Director of WIMR.





## Associate Professor Joanne Reed – Pursuing a Cure for Amyloidosis

Associate Professor Joanne Reed has joined WIMR to take up The Peter Tosi Fellowship in our Centre for Immunology and Allergy Research. She comes to WIMR with an impressive track record that makes her perfectly placed to pursue pioneering investigations into amyloidosis.

Associate Professor Reed says:

“While studying an undergraduate science degree at Flinders University I became fascinated by immunology because there were so many unknowns, and the immune system seemed to be involved in most complex human diseases. For these reasons, I did my PhD in immunology, focused on the autoimmune diseases, lupus and Sjögren’s syndrome.

My post doctorate studies then took me to New York University, Australian National University and then the Garvan Institute for Medical Research, where I developed genomic technology to investigate patient samples.

As a next step, I wanted to lead my own research lab and team.

The Peter Tosi Fellowship was an incredible opportunity to expand my research program into amyloidosis. Just twelve months before the Peter Tosi Fellowship was announced, I had received a grant where I used amyloidosis as a model disease for protein aggregation disorders caused by autoimmunity.

WIMR was attractive because of the deeply embedded translational research focus and relationship with Westmead Hospital, which reminded me of New York University and Flinders University, where research teams had access to patient cohorts through large, nearby hospitals.

One of the highlights of my research career to date is identifying the rare circulating cells that are responsible for severe autoimmune pathology. My team were the first group in the world to isolate these “disease-causing” cells. We discovered that these cells accumulated mutations, like those found in cancers, which enable the cells to initiate inflammation in the skin and

kidneys. Importantly, our detailed genomic analysis revealed therapeutic targets unique to the disease-causing cells that were absent in healthy cells within the patient.

The next steps are identifying targeted treatments that can specifically eradicate the disease-causing cells, whilst preserving healthy cells. Future research in my team is focused on identifying the underlying cause of disease so as to enable more targeted therapy that is tailored to individuals, as opposed to treating symptoms.”

“

**I am absolutely thrilled to be awarded The Peter Tosi Fellowship. Not only does the award give me the opportunity to do what I love, research complex human diseases, but it also enables me to mentor young scientists. I am incredibly grateful to the donors who made it possible.**

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# Neville Gallard: Leaving a gift of hope for cancer patients



Neville Gallard knows all too well the devastating impact of cancer. His granddaughter Gabrielle "Gabi" Grace Gallard was taken by a rare type of liver cancer (fibrolamellar hepatocellular carcinoma) just before her 21st birthday.

"She was very young, under 21 and she got cancer and died, so I just thought I would take an interest in who was doing research and that is how we came to have contact

with Professor Jacob George and the researchers at the Storr Liver Centre at The Westmead Institute for Medical Research. I am just an ordinary guy, but we just wanted to do what we could. This touched us very personally, so we just wanted to help," says Neville.

Neville's eldest son, Graeme Gallard, also sadly passed away from a gastrointestinal stromal tumour at the age of 56. The impact of Gabi and Graeme's deaths inspired Neville to leave a gift in his Will to WIMR to support the work of Professor George. Professor George and his team are working hard to understand the molecular and cellular mechanisms that drive liver diseases and cancer. The group's ultimate goal is to develop new and effective treatments to help cure these diseases.

"We were supporting church and other charities and I said to my wife Anne, (now deceased) we really should leave some of our money to support cancer research because of our family experience."

Neville believes that, by leaving a gift in his Will, he is supporting the expertise of researchers like Professor George and his team well into the future.

Leaving a gift in your Will, like Neville, is a wonderful way to honour your loved ones.

**Hilary May Black, WIMR's Gifts in Wills Manager**, can help you dedicate a gift in their memory. Contact Hilary for a confidential chat at [hilary.mayblack@wimr.org.au](mailto:hilary.mayblack@wimr.org.au) or (02) 8627 3027.

## Discovery Partners Bequestor's Club High Tea

Supporters of The Westmead Institute for Medical Research recently celebrated the launch of the Discovery Partners Bequestor's Club at a special High Tea held at Lachlan's Old Government House in Parramatta Park. The Discovery Partners is a club for those who have decided to make a lasting contribution to the health and well-being of our community and beyond, by making a gift in their Will to support medical research at WIMR.

Guests enjoyed a delightful High Tea as they heard from WIMR Executive Director Professor Philip O'Connell and researchers Dr Dinny Graham, Gemma Ward, and Dr Zoe Clayton about their vision for the future of medical research at WIMR using precision medicine techniques.

Guest and long-time community supporter Bev Museth later wrote to say:

“

Many thanks for the most enlightening few hours, last Wednesday. What an uplifting experience it was, meeting all of you and hearing about the outstanding work that is going on at the Institute, as each one of you plays such an important role. Jill and I both felt on a "high" for some time afterwards. We are spreading the word about WIMR as often as possible!

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# Fairfax & Roberts Unveils New Taia Cufflinks

WIMR is honoured by our ongoing partnership with Fairfax and Roberts, Australia's oldest jewellery house.

The Taia collection was first inspired by a visit to WIMR and learning about the world-leading research taking place. The design represents that breakthrough moment, when inspiration hits, when clarity and healing is found.

The latest addition to the collection is a pair of stunning cufflinks designed in the Fairfax and Roberts

Irene Deutsch, Managing Director, Fairfax and Roberts comments:

“

Our partnership with The Westmead Institute for Medical Research is a wonderful opportunity to give back in a meaningful way. We are so delighted to partner with WIMR to help raise awareness and directly support its broad research mandate.

”

workshop. Hand-crafted from sterling silver, the Taia Cufflinks feature a star motif set with white diamonds surrounded by pavé-set black spinel gemstones. The black element is a metaphor for the uncertainty felt when faced with illness, and the darkness of a life-threatening diagnosis. The bright, white light shines through the darkness, it's strong and clear. It's the knowledge that brilliant minds are at work, fighting the good fight for everyone in need. **From the darkness, comes the light** is engraved on the underside of the cufflink, offering a message of hope.

Profits from the sale will be donated to WIMR in the pursuit of making life-changing breakthroughs in medical research and to apply these discoveries to some of the world's most challenging diseases. RRP \$690. A bracelet is also available. For further details visit [www.fairfaxandroberts.com.au](http://www.fairfaxandroberts.com.au)



## The John & Anne Leece Family Prize 2022 – Winner Announced



Dr Adrian Lee has been announced as the winner of the inaugural John and Anne Leece Family Prize.

The prize will be presented annually to a high achieving PhD candidate or early career researcher at WIMR, whose work represents an innovative and

original contribution to resolving an important problem related to a specific disease or health condition.

Dr Lee is a researcher clinician who is training to become a specialist immunologist. He is completing a PhD with the University of Sydney within the Amyloidosis and Autoimmunity Lab in WIMR's Centre for Immunology & Allergy Research.

From a very close field of candidates, the selection panel unanimously agreed that Dr Lee stood out with an impressive academic track record and a research plan that has great potential to stimulate future high value research.

Winning the prestigious John and Anne Leece Family Prize will allow Dr Lee to focus on new investigations into Sjögren's syndrome, a common but under-researched autoimmune disease. He will use new genomic techniques to determine whether identifying the genes that are used to produce autoantibodies serve as better predictors of disease symptoms than tests currently used. Dr Lee has established a Sjögren's syndrome biobank at Westmead Hospital and intends to now expand this further.

The John and Anne Leece Family Prize has been made possible by generous philanthropists John Leece AM and Anne Leece.

# Learning from Israel's Covid-19 Response

Professor Tony Cunningham AO, Co-director of WIMR's Centre for Virus Research, was a member of a delegation of Australian COVID-19 experts that visited Israel in September 2022, sponsored by AUSiMED. The delegation met with officials and experts from the Ministry of Health, research institutions, hospitals, primary care clinicians, and more.

The group gained invaluable insight into Israel's response to the COVID-19 pandemic. This included the rapid development and local manufacture of technologies to aid medical care, as well as different models of care, such as home-based care, which could be particularly, relevant and useful

for Australia's rural and remote populations.

Professor Cunningham says, "Israel utilised an innovative and impressive approach to health data and digital health infrastructure, resulting in rapid and timely advice to government and publication of world first

COVID clinical and vaccine response data. There was also an impressive culture of emergency response amongst Israel's people and institutions. This has lessons for Australia whereby aspects of their model of rapid pandemic response might be applied to our own in future, including their rapid mobilisation of research data."



## Visualising HIV transmission interactions

HIV (human immunodeficiency virus) transmission has intrigued clinicians as nobody has been able to directly visualise the first moments of HIV transmission as the viruses are so small. This is a big knowledge gap. In order to develop a vaccine and a cure, we need to understand the first cells of the immune system which interact with this virus.

Researchers led by Professor Andrew Harman from WIMR's Centre for Virus Research have developed a technology and an analysis pipeline to not only visualise HIV transmission, but also how to accurately quantify it. Furthermore, by developing partnerships with surgeons at Westmead Hospital, researchers

can infect human tissues (in our laboratories) within 15 minutes of their removal from the human body. This is a great example of how collaboration between frontline clinicians and medical researchers can generate unique insights, in this case the creation of a map of early HIV transmission.

Arising from this collaboration, our researchers have revealed three exciting and important new insights into the way HIV is transmitted. Firstly, that a specific immune cell called a dendritic cell is the first to take up HIV. Secondly, that HIV causes other specialised immune cells (CD4+ T lymphocytes) to physically interact with dendritic cells so that the virus can infect them. These are

the cells that HIV kills leading to the onset of AIDS. Thirdly, that dendritic cells traffic HIV into the deeper tissue layers where it infects macrophages, which are white blood cells that help the immune system by aiding the removal of foreign substances from the body. These cells protect HIV from the drugs used for treatment, which is part of the reason why HIV therapy is lifelong.

Professor Harman says:

“**This represented 5 years of hard work by Heeva Baharlou during the course of his honours year and PhD. It has allowed us to witness and measure the dynamics of HIV transmission in a real-world setting.**”



# WIMR Out and About

## Sydney Science Festival

WIMR was excited to partner with Powerhouse Museum for the Sydney Science Festival in August.

Professor Jon Iredell presented his leading phage therapy research which is fighting the threat of superbugs and antibiotic resistance. Dr Zoe Clayton, Project Coordinator with Associate Professor James Chong's team explained how stem cells hold the key to rejuvenating damaged hearts, and Professor Sarah Palmer discussed how breakthroughs in HIV research assisted with the Covid-19 vaccine developments. These were free, in person presentations and it was great to see so many members of the public, including students from Newington College, welcomed to WIMR again.

Save the Date:  
WIMR Corporate Breakfast  
30 March 2023  
hosted by Deloitte.

## City2Surf 2022

WIMR participated for the first time in the annual City2Surf in 2022. There were 25 runners and walkers who together raised over \$27,000! Thank you to all who participated and donated in support of WIMR.



## Abal Banking Golf Day

After days of rain, the skies cleared in time for a wonderful annual golf day held at Twin Creeks Golf and Country Club at Luddenham. Hosted by Abal Banking, players included their wonderful corporate supporters and suppliers who enjoyed the day and a delicious lunch. Everyone had a great time with some taking home generously donated prizes and many a funny story! The golf day is a wonderful fundraiser for Associate Professor Eddy Kizana and the Centre for Heart Research and raised close to \$30,000 to ensure Eddy and his team continue their life changing work!

**Nicola Tuck, WIMR's Strategic Partnerships Manager** says:

"Thanks to Raghida and her team for all their hard work to make the day such a success!"

## Galston 500

On this one-of-a-kind family fun day, hosted by the Hornsby Model Engineers Co-Op Ltd, 5" Scale Model Locomotive teams from clubs all over Sydney challenge each other to complete a combined total of 500 laps of the picturesque 1km track at the Galston Valley Railway in just one day. After a two year hiatus it was great to see the trains hitting the tracks again, full steam ahead! The day raised over \$13,000 for MS Research at WIMR.

"Huge thanks and congratulations to organiser Allie Thackray and all involved", says **Jayne Wasmuth, WIMR's, Philanthropy Manager.**



# 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 [westmeadinstitute.org.au](http://westmeadinstitute.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

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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.

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