



Auckland Medical
Research Foundation
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Empowering Researchers Transforming Lives

2025
December

Associate Professor Amy Chan's commitment to respiratory research and understanding the severity of asthma is underscored by her own experiences. Four years ago, Amy was rushed to an emergency clinic during an asthma attack, something that quickly escalated into a life and death situation.



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Medical Research

From AMRF Fellowship to Global Impact: A Research Career

AFTER MANY YEARS of dedicated asthma research, and through an AMRF sponsored Senior Research Fellowship at the University of Auckland, Amy and her team have developed a revolutionary risk prediction tool.

Their innovative approach involved gathering real-time data from 300 individuals with asthma, using cutting-edge digital sensors, including smart inhalers and wearable devices like smartwatches. This data, combined with comprehensive health and environmental metrics, will be analysed with the aid of artificial intelligence to identify the precursors of asthma attacks.

In a recent conversation with Amy her trademark passion was evident.

"Respiratory diseases, particularly asthma, exact such a heavy toll on our community, yet with timely intervention, many of these attacks are preventable and that is what we are aiming for!"

The AMRF sponsored Senior Research Fellowship provided Amy and her collaborators with the

resources to conduct a clinical trial, with randomised patients who receive either the predictive alert system or conventional care. This trial not only validated the efficacy of their tool but also paves the way for widespread adoption in clinical settings.

Now Amy's career has been propelled forward with her appointment as Head of the University of Auckland's School of Pharmacy. Her contribution to this internationally ranked pharmacy education and research institution will no doubt ensure its, and her, continued success. But Amy's search for research excellence doesn't stop here.

This year Amy was awarded an AMRF Gavin and Ann Kellaway Travelling Fellowship, enabling her to meet with the University of Oxford Wearables Research Group in 2026 and explore 'Advancing digital therapeutics and clinical risk prediction using wearable data'.

"The ability to analyse vast amounts of wearable sensor data through advanced analytical techniques,

including machine learning, is critical to further the area of digital therapeutics," says Amy.

"This collaboration with international experts allows me to explore applications of digital and wearable technology in respiratory health and disease management. I'll also learn and develop methodologies for wearable data integration into large-scale studies relevant to New Zealand.

"I'll be able to enhance digital health capabilities in our NZ research group by translating learnings into new clinical and research applications and health interventions. I'm excited to begin a new collaboration and long-term partnership between New Zealand and Oxford.

"Thank you AMRF for the immense support and for creating these amazing opportunities to grow my academic career – none of my achievements would have been possible without the critical funding from AMRF supporters and I'm so grateful and proud to be the AMRF Senior Research Fellow."



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Partnering in 70 years of progress

AUT is Aotearoa New Zealand's University of Technology – a place where innovation, creativity, and real-world impact come together. Times Higher Education ranks AUT in the top 1% of universities worldwide and among the top 300 for medical and health studies. These rankings reflect our focus on delivering research and teaching that not only creates knowledge, but also makes a tangible difference in people's lives.

THIS YEAR, AUT is proud to celebrate a remarkable milestone with one of their most valued partners – Auckland Medical Research Foundation (AMRF) – marking 70 years.

Since the beginning, AMRF has provided the vital support that enables researchers at institutions, such as AUT, to pursue bold ideas, accelerate discovery, and deliver solutions that improve health outcomes across Aotearoa and beyond. The advances in medical and health science achieved through AMRF-funded research is a powerful testament to the Foundation's enduring importance in the research ecosystem.

"At AUT, we share AMRF's commitment to research for a reason. Our mission is to push the boundaries of knowledge and turn research into impact – improving lives, strengthening communities, and shaping a healthier future," says Professor Mark Orams, Deputy Vice-Chancellor Research.

"Our partnership with AMRF will help us to undertake the kind of research that inspires and transforms people, communities, and environments. These partnerships grow our place in the world.

"As AMRF and AUT's relationship continues to grow, we look forward to more opportunities to partner on research projects across a range of medical and health science fields that pursues our mutual goal of making a transformational difference in the lives of all New Zealanders.

"We warmly congratulate the Auckland Medical Research Foundation on an extraordinary 70 years of impact. We look forward to many more years of partnership, discovery, and innovation – ensuring that today's research continues to create tomorrow's solutions."



Professor Mark Orams

"AMRF and AUT shared important milestones this year – AMRF celebrating 70 years and AUT commemorating 25 years as a university. This served to deepen our relationship and we welcomed AUT as a 70th partner. As part of our growing partnership, I had the privilege of attending the official opening of AUT's Cognitive and Computational Neuroscience Lab in September. This state-of-the-art facility enables world-leading research in concussion, brain injury, and women's brain health: a truly remarkable initiative."

Sue Brewster | AMRF Executive Director



Our 70th year celebrated seven decades and \$100 million in funding awarded to medical research

Highlights included:

- Presentations by award-winning researchers – neuroscientist Professor Donna Rose Addis and cardiovascular scientist Professor Robert Gourdie
- Over \$1 million raised towards our Futures Fellowship Fund

Thanks to the contributions of our volunteer board, medical committee, supporters and our 70th partners: Auckland University of Technology, Shaw & Partners (formerly JMI Wealth), the University of Auckland, and our print partner, BlueStar.

ABOVE: The 1956 logo, gifted by A.J.C. Fisher, the Principal of the Elam School of Art, symbolised "a man in an aspiring attitude towards light and life". This sentiment has carried through, embodying the spirit of discovery, courage and hope that continues to guide us today.

Changes to Fellowships lead to more

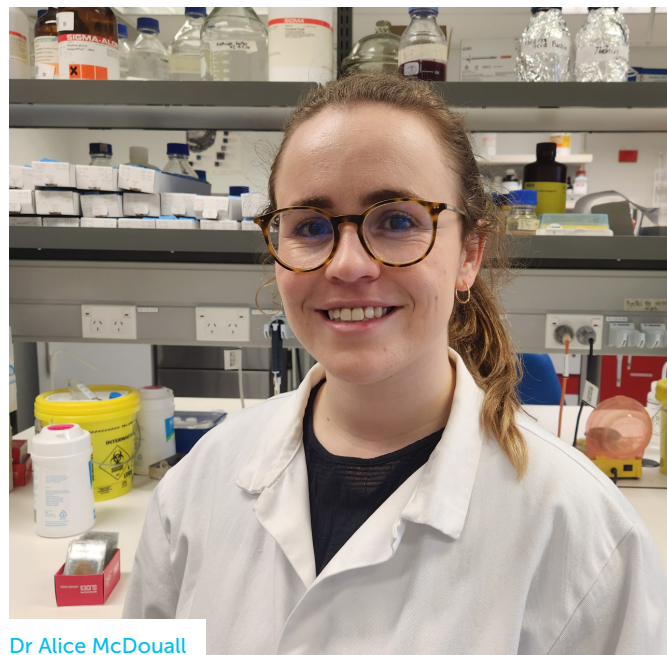
This year we introduced two new levels of postdoctoral fellowships to better support researchers at critical stages of their careers:

The **First Fellowship** for those who are within two years of completing their PhDs, and the **Career Advancement Fellowship** for researchers three to five years post their doctorate degrees.

This was clearly a much-needed demarcation for the two levels of researchers eligible to apply for postdoctoral fellowships with AMRF, as applications more than doubled from 20 to over 40.

While this created extra work for our dedicated Medical Committee, they welcomed the challenge, knowing it would lead to stronger outcomes for our award recipients.

Equally, the Committee observed that the increased quantity of applications did not diminish the quality. Having to decide on only one recipient for the First Fellowship and two for the Career Advancement Fellowship was a challenging decision to make.



Dr Alice McDouall

DR ALICE MCDOUALL, THE INAUGURAL RECIPIENT OF AMRF'S FIRST FELLOWSHIP, PROVIDED OVER A TWO-YEAR PERIOD.

ALICE IS a perinatal brain injury researcher and is driven by wanting to help newborns who suffer mild oxygen deprivation at birth—a condition known as mild hypoxic ischemic encephalopathy. While severe cases receive treatment, babies with milder forms are often left without medical intervention, despite growing evidence that they may still face long-term brain damage and developmental challenges. Alice's research is focused on finding a solution for these vulnerable infants.

During her PhD, Alice discovered that a drug called tonabersat could help protect the brain if given shortly after injury. Her experiments showed that it reduced brain tissue loss and inflammation in newborn rats and helped key brain cells survive.

Now, with support from an AMRF First Fellowship, she's taking this research further. She's testing whether the benefits of tonabersat last into adulthood and whether the drug still works if given later - closer to the time a baby would realistically receive treatment in a hospital. Her work could lead to a breakthrough therapy that gives these babies a better start in life.

Alice's project uses a well-established animal model and includes detailed behavioural and brain function testing as the animals grow. If successful, her research could fast-track tonabersat into clinical trials and offer hope to families whose babies face uncertain futures. It's a powerful example of how early-career researchers, with the right support, can make a lasting impact.

than double the applications



Dr Priyanka Agarwal



Dr Molly Swanson

DRUG DELIVERY RESEARCHER, DR PRIYANKA AGARWAL, IS ONE OF TWO RECIPIENTS AWARDED AMRF'S FIRST CAREER ADVANCEMENT FELLOWSHIP FOR A TERM OF THREE YEARS.

PRIYANKA IS INVESTIGATING a hidden danger in intensive care units. Even though mechanical ventilators are life-saving machines that help patients breathe when their lungs are failing, ironically, they can also cause serious damage to the lungs – a condition known as ventilator-induced lung injury (VILI).

This damage can trigger widespread inflammation, leading to organ failure and even death and Priyanka's research is focused on finding a way to prevent this.

She's developing a new drug delivery method for tonabersat, a compound that blocks harmful cell signalling linked to inflammation. While tonabersat has shown promise in lab tests, it's hard to deliver effectively to the deepest parts of the lungs.

Priyanka's solution is to package the drug into tiny fat-based bubbles called liposomes and turn it into a mist that can be inhaled. This approach could allow the drug to reach the lungs directly and work more efficiently.

Her project will test how well this new formulation works, how the drug spreads through the body, and whether it can reduce lung damage in preclinical models.

If successful, it could lead to a new treatment that helps critically ill patients recover faster, spend less time in intensive care, and avoid long-term complications.

OUR SECOND INAUGURAL RECIPIENT OF THE AMRF CAREER ADVANCEMENT FELLOWSHIP IS NEUROSCIENTIST, DR MOLLY SWANSON.

MOLLY IS EXPLORING a powerful but often overlooked part of the brain's immune system – cells called microglia. These cells normally act as caretakers, keeping the brain healthy and protecting nerve cells from harm. But in diseases like motor neuron disease (MND), microglia can change into a harmful state that then contributes to the death of nerve cells. Molly's research is focused on understanding how and why this happens, and whether it can be prevented.

Her project aims to find out if harmful microglia – called disease-associated microglia (DAMs) – can be "reprogrammed" back into their helpful state. To do this, Molly is using cutting-edge lab techniques to mimic the conditions of MND and observe how microglia respond. She'll identify the key genetic switches that control this damaging transformation and test whether turning those switches off can help protect nerve cells. This involves using advanced tools like CRISPR gene editing and studying real human brain tissue to confirm her findings.

Molly's work is laying the foundation for new treatments that could slow or stop the progression of MND – and potentially other diseases like Alzheimer's and Parkinson's. By building a research platform in Aotearoa New Zealand, she's helping grow our national expertise in neurodegenerative disease and opening the door to future therapies that target the brain's own immune system. It's a bold and hopeful step toward improving the lives of people affected by these devastating conditions.

PhD students: aiming for more personalised breast cancer therapies and removing barriers for neurodivergent youth

Back in 2021, Dr Emma Nolan was awarded the prestigious AMRF Douglas Goodfellow Repatriation Fellowship. Since coming home, Emma has gone on to establish the Cancer Modelling and Discovery Lab at the University of Auckland – a vibrant new research group that continues to grow as she attracts talented staff and students.



Janneke Grundemann



Josephine Tait

ONE OF THOSE STUDENTS IS JANNEKE GRUNDEMANN, A YOUNG SCIENTIST AND A RECIPIENT OF ONE OF OUR AMRF DOCTORAL SCHOLARSHIPS.

AS PART OF Emma's team, Janneke is investigating a powerful but poorly understood group of immune cells called tumour-associated macrophages (TAMs). These cells are found in large numbers around breast tumours and her research focuses on how they behave and change across different stages of breast disease – from early warning signs in high-risk individuals to invasive cancer. Her goal is to find clues that could help predict how breast cancer progresses and how patients respond to treatment.

To do this, she's using advanced imaging and genetic tools to map where these macrophages are located, how they interact with other cells, and what makes each type unique. By comparing healthy, pre-cancerous, and cancerous breast tissue, she hopes to uncover patterns that reveal how these immune cells evolve as cancer develops. This could lead to new ways of identifying which patients are at higher risk and help avoid unnecessary treatment for those with low-risk conditions like DCIS (ductal carcinoma in situ).

Janneke's work also involves testing how different types of macrophages affect tumour growth using 3D models made from real breast cancer tissue donated by New Zealand patients. These experiments will help her explore ways to 'reprogram' macrophages to fight cancer instead of helping it grow. Her research could pave the way for new treatments that target these immune cells, offering hope for more effective and personalised breast cancer therapies in the future.

JOSEPHINE TAIT IS OUR SECOND RECIPIENT WHOSE LEADING A STUDY INTO THE EXPERIENCES OF NEURO-DIVERGENT YOUTH IN AOTEAROA NEW ZEALAND.

BUILDING ON HER background as a paediatric occupational therapist, Josephine's research aims to understand the challenges these children and young people face – especially in education, health, and wellbeing – and to uncover what helps them thrive.

Neurodivergence is often linked to poorer outcomes, and her work seeks to highlight the systemic gaps and early life experiences that contribute to these difficulties.

Josephine's study will unfold in three phases. First, she will review how neurodivergent youth have been defined and studied in past research.

In the second step, she will analyse data from the "Growing Up in New Zealand" longitudinal study to explore how disability affects 12-year-olds, comparing those with and without diagnoses. This phase will help identify hidden disabilities and highlight urgent health needs.

To conclude her research work, she will track how life experiences shape disability over time and identify the protective factors that lead to better outcomes.

By taking a long-term view, Josephine's research aims to untangle the barriers neurodivergent youth face and promote fairer, more responsive support systems. Her findings will help shape early intervention strategies, improve access to services, and influence policy – ultimately supporting the wellbeing of neurodivergent young people in New Zealand and contributing to global disability research.

Inspiration through collaboration



Sryana Sukhdev



Zainab Bandukwala



A/Prof Anna Serlachius

ONE OF AMRF'S SCHOLARSHIPS WAS CREATED BY A GENEROUS DONOR, HELEN GOODWIN, TO SUPPORT OUR MOST PROMISING EARLY CAREER HEALTH AND MEDICAL RESEARCHERS, INCLUDING SRYANA SUKHDEV.

EMPOWERED BY GENEROUS DONORS, ADVANCED MEDICAL STUDENT ZAINAB BANDUKWALA ATTENDED THE 2025 NZ MEDICAL STUDENT ASSOCIATION CONFERENCE – 'VĀ', IN ŌTAUTAHU CHRISTCHURCH.

AMRF CREATED THE ANNUAL RESEARCHER NETWORK FOR EARLY CAREER RESEARCHERS IN RESPONSE TO REQUESTS FROM SCHOLARSHIP AND FELLOWSHIP HOLDERS.

STROKE RESEARCHER and PhD student Sryana Sukhdev is currently in the UK having used the travel portion of her Helen Goodwin Doctoral Scholarship to work on neuroscience experiments at the University College of London and attend international conferences.

At the recent International Union of Physiological Sciences (IUPS) conference in Frankfurt, Germany, she presented her studies entitled, "Harnessing nebulised nitrite to protect the brain during ischaemic stroke in the aged spontaneous hypertensive rat" to an audience of her peers.

"My work shows that nebulised nitrite provides neuroprotection after ischaemic stroke. One mechanism of benefit appears to be reducing reactive oxygen species, or 'free radicals', accumulation and alleviating reperfusion injury, suggesting its potential as a therapeutic strategy," Sryana shared. The positive feedback from this international audience was well received.

"In addition to engaging questions from researchers in my field, the conference itself had a really engaging atmosphere, a mix of lively discussions, interesting sessions and plenty of chances to connect informally.

"I also had the opportunity to attend lectures by Nobel Laureates, which made a strong impression on me. I also enjoyed the collaborative environment – was great to feel a real sense of enthusiasm for each other's work."

"AS MEDICAL STUDENTS, we will inherit the health system of tomorrow, and it's essential that we are equipped to lead with empathy and justice. I feel truly honoured to have been selected as a recipient of your scholarship and grateful for the opportunity to attend this formative event in my journey as a future health professional," she says.

The conference brought together students, clinicians, and researchers to discuss some of the most pressing issues facing healthcare today, from climate change and digital health to cultural safety and youth wellbeing.

"I upskilled my trauma medicine skills and learned important and practical te reo phrases for my clinical use."

Through all the talks, workshops and new friends, Vā has inspired me to be an advocate – through connecting, learning and uplifting each other. More than before, I want to incorporate advocacy as part of my future work.

"In a competitive field where excellence is constantly expected by both ourselves and our peers, it was a powerful reminder to think about why we are doing this," Zainab recounts.

"Increasing appreciation for the promise and pitfalls of technology in health communication and care delivery, and emphasising the importance of creating safe, inclusive spaces for rangatahi in Aotearoa New Zealand, valuing Vā – the relationships between us – is key to delivering equitable care."

AFTER THE FIRST HUI, we handed over the reins to our researchers so they could spearhead each annual event – making it a day that suits their interests and reflects their ever-changing challenges at this career stage.

This year, journalist and founder/director of the Aotearoa Science Agency, Damian Christie, provided a powerful presentation on media literacy. Feedback was enthusiastic, with many noting the value of his experiences and advice for their career development through the access of both traditional and social media.

A/Prof Anna Serlachius, e-health researcher and previous recipient of AMRF funding, spoke about her health psychology research. Her work to create evidence-based wellbeing technology (smart phone apps) for struggling young people light on human-centred research that many lab-based scientists appreciated.

Creating research collaborations, connecting with other like-minded researchers and establishing peer and mentor relationships have been the aims and natural outcomes of the annual hui, and testament to the gap in career development programmes that this event fills.

Each year the AMRF Researcher Network Hui evolves and improves by building on the input and insights from past and present AMRF award winners as they navigate their research and academic careers.