

# INSPIRE

RESEARCH AUSTRALIA SHOWCASES HEALTH & MEDICAL RESEARCH

## RESEARCH AUSTRALIA

PUTS DATA  
FRONT AND  
CENTRE IN NSW  
PARLIAMENT  
HOUSE

EXPERIMENTAL  
MEDICINE PROVIDING  
NEW HOPE FOR  
ADVANCED PROSTATE  
CANCER PATIENTS

A NEW CHAPTER IN  
DISEASE DETECTION

RESEARCH  
AUSTRALIA  
CONNECTING • ENGAGING • INFLUENCING



## Message from CEO

The mid-way mark of the year is upon us, and this year it is bringing with it a new level of change, opportunity and excitement. There is much to be enthusiastic about in our sector, not least of all because of the incredible research being produced across our institutions, all of it changing the outcomes for Australian patients and contributing to a one of our greatest opportunities – that of health and medical research driving a healthy population and healthy economy.

Early last month we saw the delivery of the 2018/19 Federal Budget (a full analysis was published on our website on the night, and it makes for good reading), and as always there were winners and losers. Fortunately, health and medical research fared reasonably well. There is concern that funding for the NHMRC is stagnant and declining in real terms and Research Australia will be focusing its advocacy efforts here, having long been a champion in this space. On a positive note, there was a major win when our call for the government to use the Medical Research Future Fund to boost research at the limits of our application of human health science and technology was answered. This was done in the form of a game-changing \$240m investment in a Frontier Health and Medical Research Program. It's a new approach to galvanising the technologies of the future, and with an economies of scale approach it provides an opportunity for Australia to lead in what are ultimately the capabilities of the future. It is recognition that Australia truly does have the best and the brightest with the capabilities of global leadership in frontier technologies.

In this edition of INSPIRE you will discover exactly why there is much to be excited about in the world of health and medical research, both in the work being done at some of our member organisations and here at Research Australia. As part of our mandate to drive HMR narrative, you will read about how we launched the first of our Speaker Series at NSW Parliament House, and you will find details about the big sector event of 2018, the Health and Medical Research Awards, now in their 16th year!

There are also a number of world-first discoveries covered in this issue, showing once again that Australian health and medical research is at the forefront of discovery in this golden age for our sector. One such discovery is the one made by two researchers at the University of Sydney Nano Institute, who have unlocked the path to use cell nanoparticles as biomarkers. Then there are details on the amazing world-first clinical trial of a locally developed experimental medicine for advanced prostate cancer being run by researchers from Western Sydney University and the Ingham Institute for Applied Medical Research.

It is essential that we showcase the best in Australian health and medical research, so we encourage you to share with us your case studies for inclusion in a future edition of INSPIRE Magazine.

Continuing the focus on our place as a global leader in the frontier medical technology space, our next edition of INSPIRE will have a “frontiers” theme, so if you are working in areas like precision medicine, machine learning, the human microbiome, gene and cell-based medicines, epigenetics, robotics or immunotherapy then we would love to hear from you. Enjoy!

**Nadia Levin**  
CEO & Managing Director

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### INSPIRE ONLINE

[issuu.com/researchaustralia](http://issuu.com/researchaustralia)

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### Who can submit articles?

Any current member of Research Australia who would like to share a relevant story that affects their organisation including, philanthropic donations and their outcomes, research findings, and any other related health and medical research topic that affects the Australian population.

### Submission guidelines & deadlines

For information regarding how to submit and publishing deadlines visit the Research Australia [website](http://researchaustralia.org).

**On the cover:** *Closer*, Luke Hammond, Queensland Brain Institute Microscopy Facility, The University of Queensland

Being able to accurately trace neurons (brain cells), including the fine protrusions (spines) where they connect with other neurons is essential to advancing our understanding of the brain. This image was captured using high-resolution spinning disk confocal microscopy and further processed to digitally restore finer, previously obscured details. The combination of these techniques here allows a precise reproduction of two adjacent neurons.

Colour in this image reflects depth in 3D.

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**RESEARCH AUSTRALIA**  
CONNECTING • ENGAGING • INFLUENCING

# NOMINATIONS OPEN!

## RESEARCH ♦

## AUSTRALIA

### HEALTH & MEDICAL RESEARCH

## AWARDS

## NIGHT 2018 ♦

### THURSDAY 8 NOVEMBER 2018

Sofitel Sydney, Darling Harbour

Nominations for the peak industry awards for the health and medical research sector are now open. The 2018 Research Australia Health and Medical Research Awards celebrate the individuals and organisations who have made an outstanding contribution to delivering a better quality of life and stronger economy for all Australians.

**Nominations are now open for the following categories:**

- ♦ The Peter Wills Medal
- ♦ Great Australian Philanthropy Award
- ♦ Health Services Research Award
- ♦ Griffith University Discovery Award
- ♦ Leadership in Corporate Giving Award
- ♦ Data Innovation Award
- ♦ Research Champion Award
- ♦ The GSK Award for Research Excellence

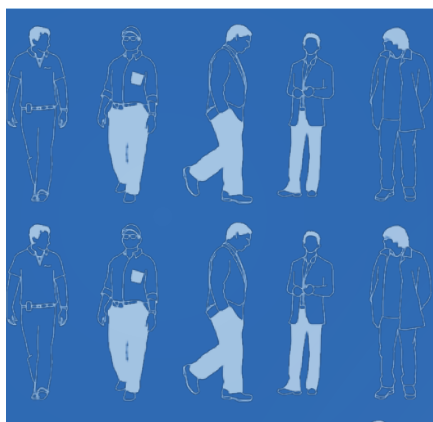
Please visit [www.researchaustralia.org/awards](http://www.researchaustralia.org/awards) for more information on how to nominate.

**Nominations will close at  
9am Monday 23 July 2018.**



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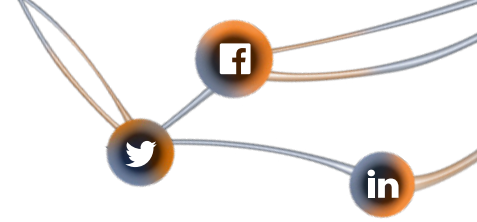


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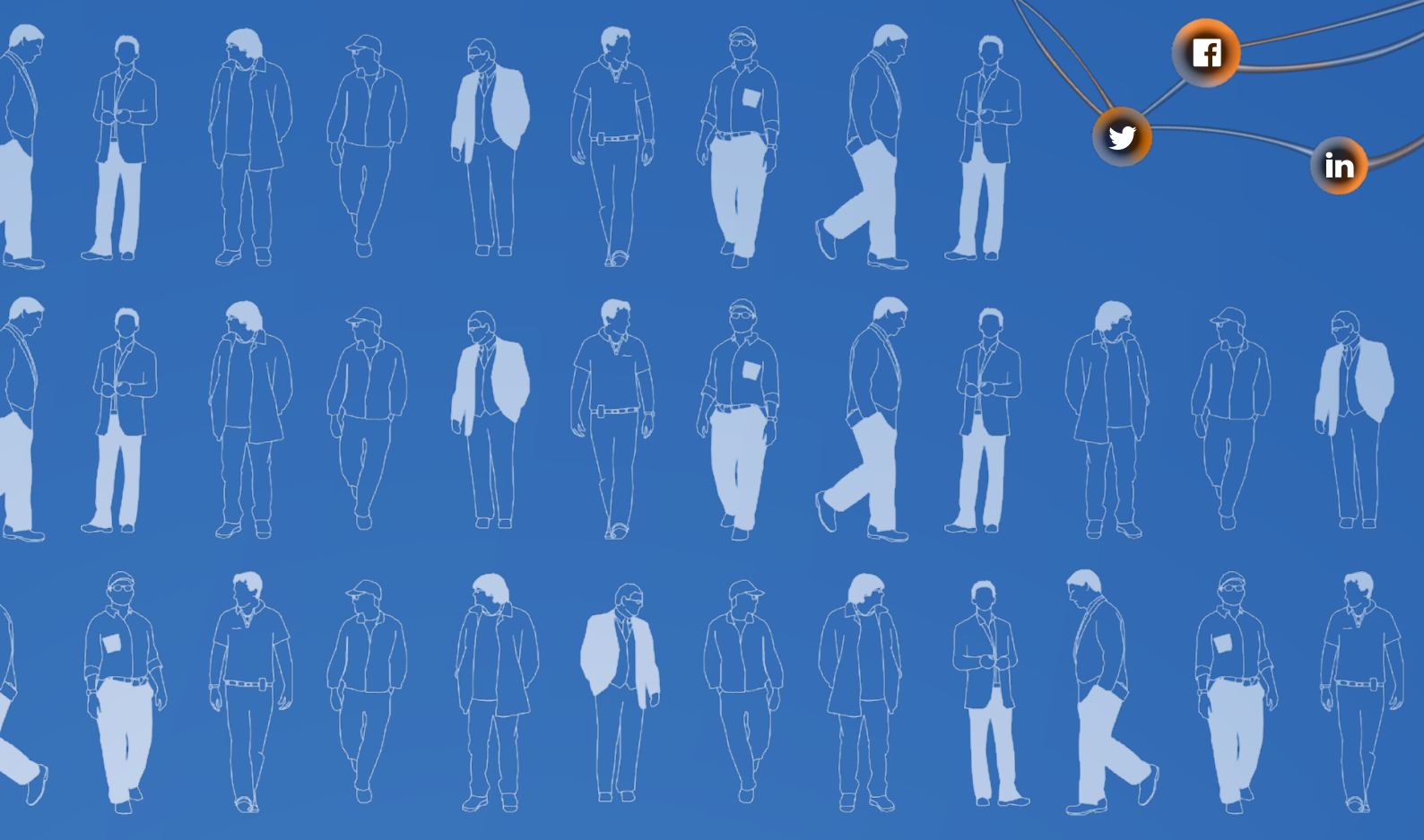




# EXPERIMENTAL MEDICINE PROVIDING NEW HOPES FOR ADVANCED PROSTATE CANCER PATIENTS







# CINE E STATE

Researchers from Western Sydney University and the Ingham Institute for Applied Medical Research are conducting a world-first clinical trial of a locally developed new experimental medicine for advanced prostate cancer.



**I**n Australia, prostate cancer is the most commonly diagnosed cancer in men, killing more than 3000 men each year.

Prostate cancer is generally a slow growing disease. In the early stages there may be no symptoms and the majority of men can live for many years without it spreading and becoming life-threatening. However, once it progresses to an advanced stage, the cancer can very quickly become lethal.

Associate Professor Kieran Scott, from the School of Medicine at Western Sydney University and based at the Ingham Institute for Applied Medical Research, has been working for 15 years on the development of a new, experimental medicine – which is filling a gap in the treatment of advanced prostate cancer.

“Patients with advanced castrate-resistant prostate cancer (CRPC) have a poor prognosis, with a median survival of around 18 months,” said Associate Professor Scott.





The State Member for Holsworthy, Melanie Gibbons MP, and Professor Paul de Souza at the official launch of the Phase 1 Trials Unit at Liverpool Hospital.



(L-R): Professor Paul de Souza; Associate Professor Kieran Scott; The State Member for Holsworthy, Melanie Gibbons MP; Liverpool Hospital General Manager, Robynne Cooke; Professor Les Bokey; and Professor Annemarie Hennessy. At the official launch of the Phase 1 Trials Unit at Liverpool Hospital.

**“No treatments are curative once patients develop CRPC. In this situation, docetaxel, a chemotherapy drug, is often prescribed. But following this course of treatment, survival is only prolonged by around 2-4 months, and patients are often not considered well enough to qualify for clinical trials of experimental therapies.”**

### NEW DRUG SHOWS PROMISE

Associate Professor Scott says there is an urgent need to find novel therapies which are low in toxicity and can offer hope for patients with advanced prostate cancer.

“We have developed a new drug which is showing promise for the treatment of men with CRPC who have failed at least one course of chemotherapy. In lab testing, the drug – known as ‘c2’ – has inhibited tumour growth and inflammation, with no toxicity observed,”

If c2 can do in men with prostate cancer what it has been shown to do to prostate tumours in the lab, it could

save over 1000 Australian lives each year. And this bold declaration has unsurprisingly led to an overwhelming community response.

“There are so many people who are living with or caring for a loved one with prostate cancer. This new treatment has definitely elevated hope in the community, and we have been inundated with expressions of interest, from patients who are hoping to be involved in the trial.”

### A FIRST-IN-HUMAN TRIAL

Professor Paul de Souza, Foundational Professor of Medical Oncology within the School of Medicine at Western Sydney University and Translational Cancer Research Stream leader at the Ingham Institute, said c2 has progressed from a pre-clinical trial in the lab, to a world-first phase 1 clinical trial at Liverpool Hospital.

“In the development of any new drug, the first tests are conducted in the lab and in animals. If the drug is promising at that stage, then research needs to cross the bridge into human trials. These ‘first-in-human trials’ are also called phase 1 trials,” said Professor de Souza.

“These phase 1 trials investigate some of the unknown aspects of the drug, particularly the proper dose; whether



**Associate Professor Kieran Scott speaking at the official launch of the Phase 1 Trials Unit at Liverpool Hospital.**



it acts on the molecular target as projected; and of course, any side effects.”

The phase 1 clinical trial of c2 will be conducted in a new and highly specialised unit within Liverpool Hospital. The ‘Phase 1 Trails Unit’ – which was officially opened by the South West Sydney Local Health District in collaboration with the Ingham Institute in December 2017 – was designed and purpose-built as the home base for such innovative clinical trials.

The unit provides a dedicated space to conduct phase 1 trials of cancer medications, with the ability to provide medication to eight patients at a time – with services including treatment delivery; blood sampling and processing; monitoring (e.g. by ECG, blood pressure); patient and staff education; and patient review and assessment. Close proximity to the Ingham Institute research labs allows fast turnaround time in research investigation of the efficacy of the treatment.

### **BRINGING THE LAB TO THE BEDSIDE**

The unit allows the laboratory to be brought to the patient's bedside.

“In clinical trials, blood samples are usually taken from a

patient and then transported to research laboratories, which could be somewhere else in the world. There is always a delay when samples are shipped, and this can cause deterioration in the samples,” Professor de Souza said.

“In this new, dedicated space, samples can be processed immediately, allowing patients to see and understand what happens to their blood; and allowing researchers the capacity to do more relevant, time-sensitive tests – such as looking at live cancer cells floating in the blood.”

The clinical trial is being funded by a grant from the Prostate Cancer Foundation of Australia, and is administered by Western Sydney University.

The clinical trial is currently underway. For more information, or to express an interest in participating in the trial, email [media@westernsydney.edu.au](mailto:media@westernsydney.edu.au).

**Author: Danielle Roddick, Senior Media Officer, Western Sydney University.**



# RESEARCH ♦ AUSTRALIA HEALTH & MEDICAL RESEARCH AWARDS NIGHT 2018 ♦

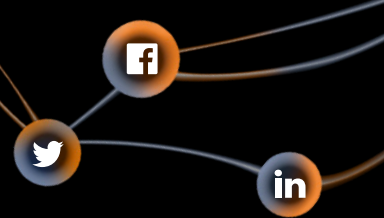


Research Australia Patron, Sir  
Gustav Nossal

When:	Thursday 8 November, from 6.30pm
Where:	Sofitel Sydney, Darling Harbour
Dress:	Black Tie







Research Australia is pleased to announce that nominations are now open for the 2018 Health and Medical Research Awards. The Awards are the pinnacle of health and medical research achievement in Australia, and we are now encouraging members to nominate individuals and organisations who have made an outstanding contribution to delivering a better quality of life and stronger economy for all Australians.

Nominating for a Health and Medical Research Award is easy, and as a Research Australia member there is no cost attached to a nomination. Never has it been so important to highlight the crucial role health and medical research plays in all our lives, so we encourage all members to take the time to nominate those who have made a difference and ensure they get the recognition they deserve.

Previous recipients of the Awards included Macquarie Group Foundation and Volvo Car Australia (Leadership in Corporate Giving); Nicola Forrest and Andrew Forrest AO (Great Australian Philanthropy Award); Prof Michael Barton OAM (Health Services Research); Connie Johnson & Sam Johnson (Advocacy); Sir Gustav Nossal, AC, CBE, FAA, FRS and Prof Sharon Lewin (The Peter Wills Medal) and more.

#### **Nominations are now open for the following categories:**

- ◆ The Peter Wills Medal
- ◆ Great Australian Philanthropy Award
- ◆ Health Services Research Award
- ◆ Griffith University Discovery Award
- ◆ Leadership in Corporate Giving Award
- ◆ Data Innovation Award
- ◆ Research Champion Award
- ◆ The GSK Award for Research Excellence

**Nominations will close at 9am Monday 23 July 2018.**

**Please visit [www.researchaustralia.org/awards](http://www.researchaustralia.org/awards) for more information on nominating.**

*Winners will be announced at the 2018 Research Australia Health and Medical Research Awards Dinner*

**Chris Chapman (Chairman, Research Australia), Nadia Levin (CEO & Managing Director, Research Australia), Professor Peter Leedman (Director, Harry Perkins Institute of Medical Research), Bruce Mansfield (Chief Operating Officer, Minderoo Foundation), The Hon Greg Hunt MP (Federal Minister for Health)**

## **PARTNER WITH US**

The Health and Medical Research Awards Dinner is the premier health and medical research event in Australia, with in excess of 200 of the most influential decision makers, from our sector, in attendance. If you are interested in getting in front of our delegates, then we can tailor a partnership package to suit your needs. Please contact the RA team via email [admin@researchaustralia.org](mailto:admin@researchaustralia.org) for further information.



**Federal Minister for Health,  
The Hon Greg Hunt MP**

# POWER OF PARTNERSHIPS TO DRIVE FUTURE OF HEALTH

*Medical technology sector*

*Pharmaceutical sector*

*Public and philanthropic funding*

*Biotechnology sector*



Innovation requires investment and collaboration to ensure world-class research is translated into viable health and medical technologies and treatments. It is through the immense power of collaborative partnerships between research and industry that we are truly able to realise the potential of innovation to improve health outcomes.



ARC CEO, Prof. Sue Thomas (second from right) officially launches the ARC Research Hub for the Advanced Manufacturing of Medical Devices (AMMD Research Hub) with, from left, Director of the Advanced Manufacturing Growth Centre Mr Michael Grogan, Member for Sunnybank Mr Peter Russo MP, AMMD Research Hub Director Prof. Matthew Dargusch, Cook Medical Australia General Manager Dr. Samih Nabulsi, Director Asia Pacific, VP Cook Incorporated Mr. Barry Thomas and UQ Vice-Chancellor and President Prof. Peter Høj.

**A**ustralia has a long and distinguished track record of health and medical research excellence, and as a nation, we are among the top countries in the world for biomedical research, producing approximately 3% of the world's published medical research.

Australia's success in global markets is often related to an innovation in product performance<sup>1</sup>. For example, the medical device industry in Australia has developed at a rapid rate, taking advantage of advances in materials, robotics, imaging, IT and design through research and collaboration. There is growing evidence of the importance of industry-research partnerships for successful innovation. Neither research, nor industry alone, can hope to achieve what is possible as a collective. Innovation occurs at the intersections—it is the knowledge transfer that comes from taking a collaborative, cross-disciplinary and cross-sectoral approach to medical technology that leads to game-changing innovations that inspire real advances in patient health outcomes.

## ACCELERATING INNOVATION THROUGH INVESTMENT

Commitment of both time and resources by all partners is essential to achieve the desired outcomes. In its 2017 Annual Highlights Report<sup>2</sup>, MTPConnect noted the medical technology, biotechnology and pharmaceutical sector combined, invested around \$1.4 billion in R&D with almost half of that figure coming from industry.

With public and philanthropic funding accounting for the remainder, government organisations play a pivotal role in encouraging and facilitating business-to-business and business-to-research collaboration, such as through their co-investment programs.

But where we at Cook Medical Australia see government influence making a far greater contribution is through inspiring cultural change in industry and research, so that innovation through collaboration becomes the norm for innovation, rather than the notable exception.

The overarching philosophy, regardless of industry or sector, should be 'we are in this together'. Indeed, in considering how to frame its strategy for the future, Innovation and Science Australia (ISA)<sup>3</sup> has recognised that innovation is the product of a collaborative ecosystem and culture.



*Government organisations*

<sup>1</sup> Advanced manufacturing growth centre sector competitiveness plan 2017

<sup>2</sup> 2017 MTPConnect Annual Highlights

<sup>3</sup> Australia 2030: Prosperity through Innovation






Researchers

“

*The overarching philosophy, regardless of industry or sector, should be ‘we are in this together’.*





Cook Medical Australia's  
stent-stent graft  
manufacturing facility.

## ADVANCING PERSONALISED CARE THROUGH COLLABORATION

Drawing on the collective experience is key to increasing the translation of new technology and better outcomes for patients. It is equally important for growth opportunities for the sector, job creation, and increased output and market share of Australian manufactured medical technology.

When a personalised medical device for Endovascular Aneurysm Repair (EVAR) was first considered it took several years for a team of researchers, physicians and experts from a range of industries to design, develop and manufacture the first customised stent graft.

At Cook Medical Australia we continually look at ways we can provide the highest quality product, customised to a patient's unique anatomy more efficiently to improve patient outcomes. Today, this collaborative approach is what continues to drive improvements in both product design and manufacture. Successful ARC Linkage Projects have delivered knowledge and manufacturing practices for less-invasive, low profile stent-graft devices and most recently, the development of a new generation of biocompatible materials and devices.

## PARTNERSHIPS ALIGNED ON OUTCOMES

Partnering with the University of Queensland, Cook Medical Australia has been instrumental in bringing together research partners including the University of the Sunshine Coast, the University of Sydney, RMIT, with industry partners including Robert Bosch (Australia) Pty Ltd.; Heat Treatment (Qld) Pty Ltd. and QMI Solutions Ltd, to establish the Australian Research Council (ARC) Research hub for Advanced Manufacturing of Personalised Medical Devices (*AMMD Research Hub*). The AMMD Hub aims to develop significant improvements in device design and production to deliver medical devices to patients in a timely manner, resulting in better health outcomes. In total, the collaboration includes \$10 million of cash and in-kind funding, including a \$2.8 million contribution over five years from the Australian Government through the ARC's Industrial Transformation Research Hubs scheme.

The AMMD Research Hub aims to make a significant contribution to advancing the medical device industry in Australia through efficiency of processes, materials and technologies, and realise further export opportunities for intellectual property (IP) derived from manufacturing process improvements. The hub engages Australia's best researchers in challenges facing the new industrial economies and training for the future workforce.

From a manufacturing perspective, the AMMD Research Hub represents a critical mass that can take advantage of the synergies and strengths of the individual participants to deliver productivity benefits that would not be realistically achievable outside of this network.

From a patient and treating doctor perspective, the AMMD Research Hub's approach to research and innovation offers the promise of improvements to patient care and clinical outcomes by reducing the complexity associated with manufacturing medical devices.

The AMMD Research Hub highlights the immense power of partnerships between research and industry, with the support of government, to drive innovation in the medical devices sector.

**Author: Dr Samih Nabulsi**, General Manager at **Cook Medical Australia** and Partner Investigator ARC Research Hub for Advanced Manufacturing of Medical Devices.





# DISCOVER TO STAY NEW CH INDISE DETECT





# EVERY RTA HAP TER ASTE TION

Two researchers from The University of Sydney Nano Institute have unlocked the path to use cell nanoparticles as biomarkers. These highly specialised messenger cells, called extracellular vesicles, will assist in disease detection and make it possible to engineer stem-cells for regenerative medicine.



**A**ssociate Professor Wojciech Chrzanowski and Sally Yunsun Kim have established this method which could pave the way for a new approach to the global challenge of early disease detection.

The particles, known as extracellular vesicles, or EVs, are routinely released by cells and play a central role in intercellular communication, sharing vital information such as DNA, RNA and proteins. “This really is at the cutting edge of our knowledge of cellular development,” said Associate Professor Wojciech Chrzanowski, co-author of a new paper on EVs published in the Royal Society of Chemistry’s Nanoscale Horizons. “EVs could not only be used to identify cellular pathologies but because they carry essential information about cell development, we could engineer them for purposes of tissue repair.”

## APPLICATIONS IN DIAGNOSIS AND TREATMENT

Associate Professor Chrzanowski said the ability to identify individual EVs will provide biomarkers for diverse diseases such as cancers, cardiovascular, kidney and liver disease as well as dementia and multiple sclerosis. He said it will also allow scientists to engineer EVs for use in tissue regeneration and help start a new chapter in stem-cell therapies and regenerative medicine. “The human body naturally directs EVs from stem cells to damaged tissue to assist in its repair. By harnessing this knowledge, we could create a new generation of cell therapies.”

Understanding the particular nature of EVs is therefore essential for developing their application for diagnostics and therapeutics. For instance, early-stage cancerous cells release EVs that indicate the presence of malignant tissue in the body.

The study of extracellular vesicles is a relatively new field. It is only in the past decade that it has been known that cells communicate and transfer molecular and genetic

information using EVs. The full potential to harness this knowledge for biomedical use has been hampered due to difficulties in establishing the heterogeneous nature of EV populations. Until now, they have only been analysed as large-scale populations with insufficient sensitivity.

## IDENTIFICATION IS THE KEY

Lead author of the paper, doctoral candidate Sally Yunsun Kim, said:

“*To unlock the true potential of EVs, what is needed is a new approach to unequivocally define nanoscale differences at a single EV level – and that is what we have done.*”

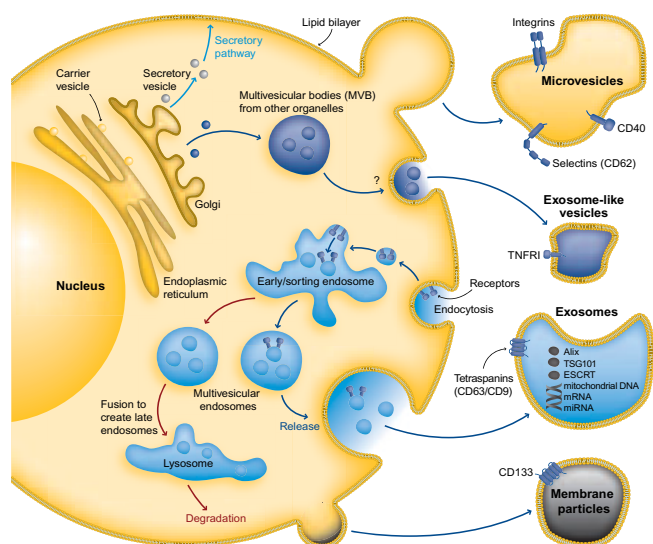
This is because it is the individual nature of the EVs as released by cells – affected by cellular morphology, genetics and environment – that give them their agency in human tissue repair.

Ms Kim, Associate Professor Chrzanowski and their team have developed a way to identify individual EV nanostructures, through examination of human placental stem cells provided by co-author Dr Bill Kallionis from the Royal Women’s Hospital in Melbourne.

In the Nanoscale Horizons paper, the team details a new method to identify the nanoscale composition of EVs using “resonance-enhanced atomic force microscope infrared spectroscopy” (AFM-IR). This involves isolating singular EVs, thermally agitating them and then reading the particular signal or ‘fingerprint’ from this thermal activity using a 20-nanometre-wide detector.

Ms Kim, said: “We can do this using small amounts of human material, such as blood or urine samples. When cells create EVs they are spread throughout the body.” Associate Professor Chrzanowski said this ability to determine the particular nature of EVs will also allow scientists to continue fundamental research into how and why EVs are created by cells. “This is a new and exciting field for biomedical research. And Australia is playing a leading role in this area.”

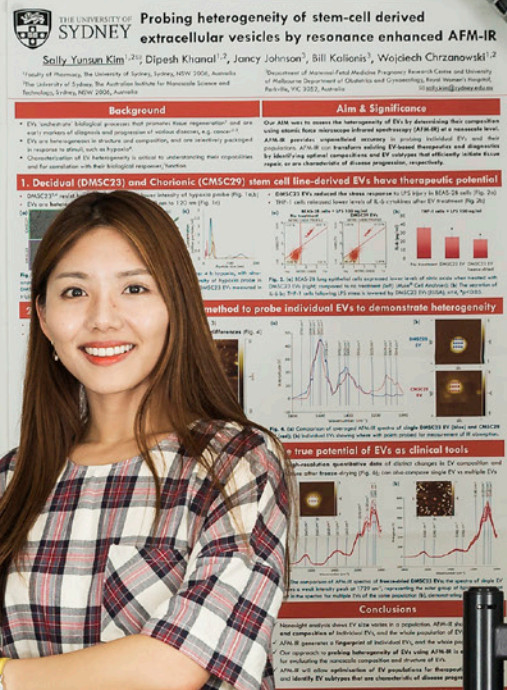
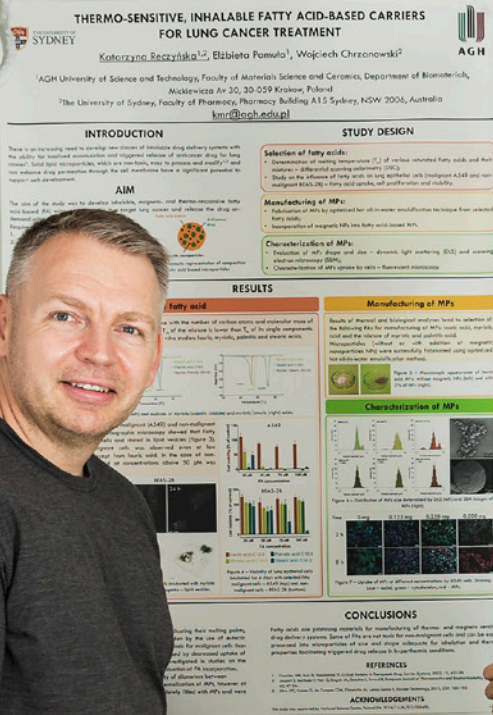
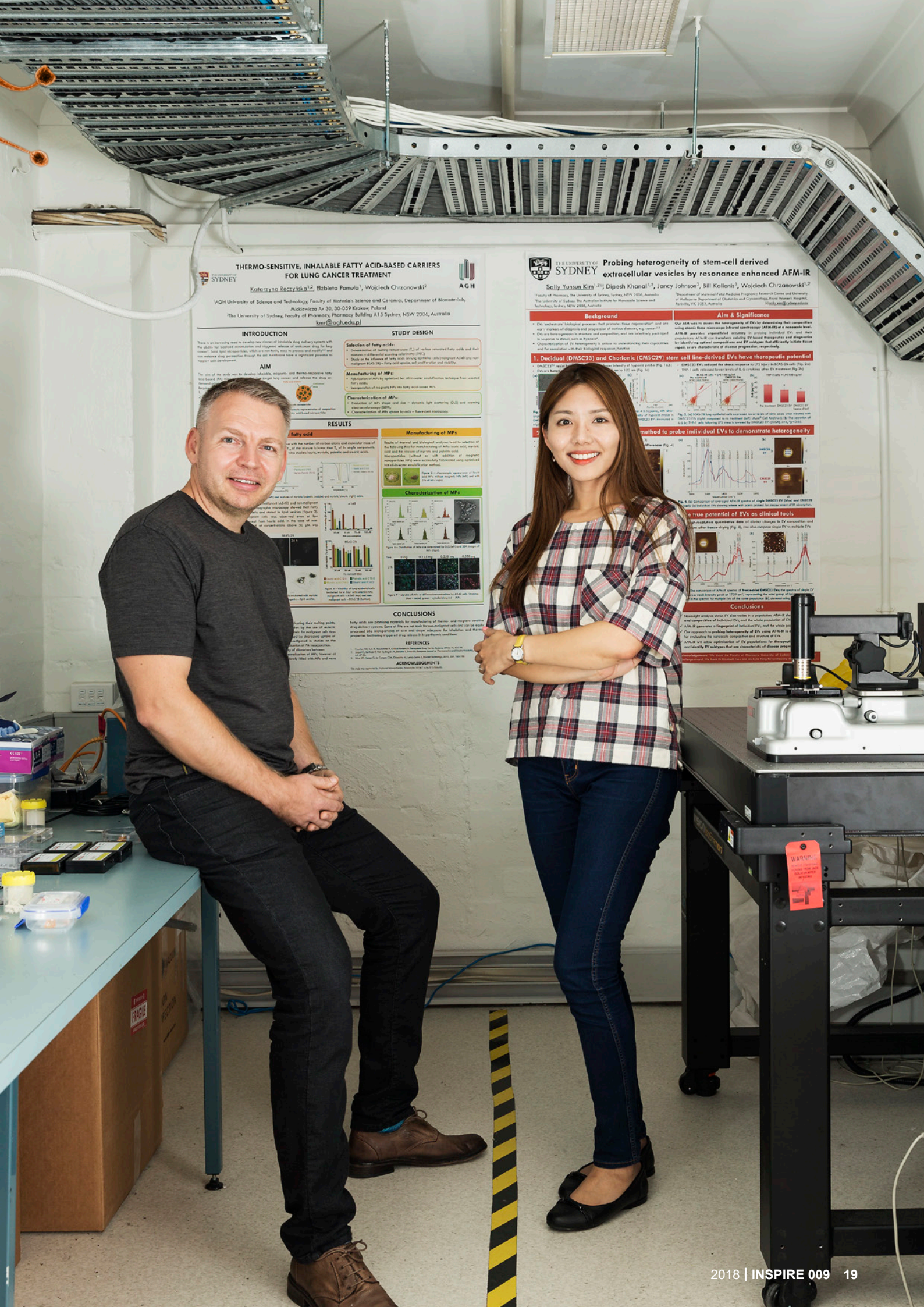
Do you want to be a part of the future of EV research and its possibilities? Associate Professor Chrzanowski is a joint organiser of the [Australian Extracellular Vesicles Conference](#) in November this year. “The best people in the world will be here sharing their knowledge in a field with such promise for biomedical treatments,” he said.



Extracellular vesicles such as exosomes transport vital information between cells. Image courtesy of Abcam.com

**Authors: Associate Professor Wojtek Chrzanowski MSc, PhD, DSc, Ms Sally Yunsun Kim, B Pharm, MPhil, PhD Candidate.**







# RESEARCH AUSTRALIA PUTS DATA FRONT AND CENTRE IN NSW PARLIAMENT HOUSE

Researchers, policymakers and politicians discussed some of the most topical issues around the use of data in health and medical research, diving in to the complex issues of data safety, how data can be used to make Australian's lives better and exactly why the research community wants your data.





**T**he Hon Catherine Cusack MLC, NSW Parliamentary Secretary for Digital Inclusion, welcomed attendees to the first in a series of events designed to highlight some of the most topical issues facing the sector today.

Facilitated by ABC's National Medical Reporter, Sophie Scott, the panel discussed the topic of "Is New South Wales ready to harness the transformative power of data in health and medical research?". The panel included Dr Jean-Frédéric Levesque (CEO of the NSW Agency for Clinical Innovation), Professor Emily Banks (Scientific Director of the Sax Institute's 45 and Up Study), Dr Avi Ratnanesan (CEO of Energesse) and Harry Iles-Mann (Patient/Consumer Advocate).

With the Australian Digital Health Agency's creation of a My Health Record for all Australians, by the end of the year the discussion focused on the collection, use and protection of consumer data in the health system. The audience was taken on a health consumer's journey through the eyes of Harry Iles-Mann, who shared the good and bad of his experiences and why he is so passionate about engaging the public in the future of health and medical research.

Dr Levesque spoke to the audience about where NSW is heading regarding data-centric projects that will impact health consumers, and how the state is placed compared to other health systems through the lens of his time in senior positions responsible for publicly reporting information in the Canadian health system.

The crowd included representatives from the Australian Digital Health Agency, NSW Ministry of Health, Australian Institute of Health and Welfare, NSW Department of Premier and Cabinet, Austrade, the Australian Red Cross Blood Service, the Centenary Institute, Ingham Institute

and Bupa Health Foundation.

The 45 and Up study run by the Sax Institute is the largest ongoing study of healthy ageing in the Southern Hemisphere, following a group of more than a quarter of a million people. This placed the study's Scientific Director, Professor Banks, in a unique position to share insights on how important data is to researchers whilst Dr Ratnanesan described how his company translates the voice of the consumer to healthcare providers.

**“The discussion's focus on data was no coincidence, with Research Australia advocating “Data as a national resource” as a key strategic objective. The focus of this being harnessing the transformative power of data to accelerate advances in health. For more insight into this strategic focus, [click here to read the Collaborative Strategy](#).**

The event was made possible by very health and research focused event partners, the Vodafone Foundation and the Garvan Institute of Medical Research. Dan Lloyd, Vodafone Foundation Chief Strategy Officer, was on hand to talk about the DreamLab app which uses smartphones to donate data to download tiny research problems, calculate them, and then send the result back to the research team at Garvan.

Stay tuned to the [Speaker Series page](#) on the Research Australia website for more information on upcoming Speaker Series events.



An aerial photograph of a road intersection. A white sedan is driving through the intersection. The road has white dashed lane markings and a solid white stop line. There are traffic lights at the intersection. A pedestrian is visible on the sidewalk. The text "DRIVER BEHAVIOUR A FOCUS IN TEST OF COOPERATIVE VEHICLE TECHNOLOGY" is overlaid on the right side of the image.

# **DRIVER BEHAVIOUR A FOCUS IN TEST OF COOPERATIVE VEHICLE TECHNOLOGY**

Consortium aims to boost  
Australian road safety.







**T**echnology such as connected cars shows promise in improving road safety and contributing to a reduction of road deaths and injuries. An important consideration for planners and policy-makers is driver behaviour, acceptance and adoption.

The considerations form an important part of research being conducted as part of the iMOVE Cooperative Research Centre, a consortium of 44 industry, government and research partners engaged in a 10-year effort to improve Australia's transport systems.

The Queensland Department of Transport and Main Roads (TMR) is delivering an on-road test of a number of Cooperative Intelligent Transport Systems (C-ITS) technologies fitted to about 500 public and fleet vehicles in Ipswich from late 2019.

### **QUT MULTIDISCIPLINARY RESEARCH TEAM**

Professor Andry Rakotonirainy is leading a QUT study as part of the TMR test, managing a team that spans QUT's Institute of Health and Biomedical Innovation and the Centre for Accident Research and Road Safety – Queensland.

Professor Rakotonirainy brings to the consortium his expertise in human factors and road safety, complementing QUT project manager Dr Andy Bond's focus on the future of transport, new technology and patterns of use based on work in road safety, law and robotics.

Another 10 QUT researchers contribute their expertise, covering disciplines such as psychology, human behaviour and communications, mathematics, traffic engineering, statistics and computer science.

Professor Rakotonirainy said the collaboration would consider multiple aspects, including planning and design of future transport networks and services; driver behaviour and responses to the technology and warnings; and strategies for enhancing driver acceptance and adoption. The technologies include warnings that alert drivers to upcoming hazards involving other vehicles on the road network. They include vehicles braking hard some distance ahead, pedestrians or cyclists crossing at an intersection, hazards on the road such as water or debris, road works, a change to speed limit and congestion that is not visible to a driver.

Findings from QUT's research will be used by local, state and federal transport agencies to support the investment in infrastructure, both digital and physical, that meet the emerging C-ITS need, Professor Rakotonirainy said.

"The ultimate goal is to conduct evidence-based research to inform government about the benefits of C-ITS deployment," Professor Rakotonirainy said.

iMOVE CRC Managing Director Ian Christiansen said the newly-established research centre was delighted to be working with such a large number of stakeholders on such a promising field trial.

Professor Andry Rakotonirainy brings advanced expertise in human factors and road safety to a consortium focused on improving Australia's transport systems.



"During the coming decade, vehicle-to-vehicle and vehicle-to-infrastructure connectivity will enable the development of a smarter and more productive transport system in Australia and worldwide," he said. "This will make it safer and easier for people to move around, as well as boost productivity for business and industry."

The research has funding from the iMOVE CRC and support from the Cooperative Research Centres program, an Australian Government initiative.

It recognises that driving remains one of the most dangerous activities a person can perform, despite a decline in road deaths each decade in Australia.

During the 12 months ended December 2017, there were more than 1200 road deaths in Australia.

Although that is a 6.4 per cent decrease compared to the total for the 12-month period ended December 2016, serious injuries continue to increase. More than 6000 people in Queensland are taken to hospital each year due to road trauma, with each hospitalised casualty costing the Queensland community more than \$500,000.

Hospital admissions involving brain and spinal injuries cost the community an estimated \$8 million per injury and have lifelong repercussions for the patients.

The C-ITS pilot project is part of the larger Cooperative and Automated Vehicle Initiative (CAVI) being delivered by TMR to help prepare for the arrival of new vehicle technologies with safety, mobility and environmental benefits on Queensland roads.

The CAVI project will also include the testing of a small number of cooperative and highly automated vehicles on South East Queensland roads, as well as investigate options for using emerging technologies to benefit pedestrians, cyclists and motorcycle riders.

**Author: Erik de Wit, Communications Program Coordinator, Institute of Health and Biomedical Innovation, QUT**



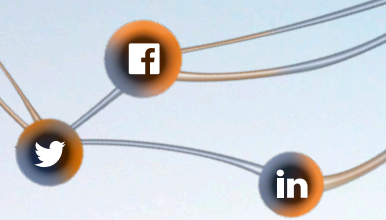
“ During the coming decade, vehicle-to-vehicle and vehicle-to-infrastructure connectivity will enable the development of a smarter and more productive transport system in Australia and worldwide











**Royal Far West**  
Children's health, country-wide

# IMPROVING DEVELOPMENTAL HEALTH OUTCOMES FOR RURAL AND REMOTE KIDS

Royal Far West, working with the University of Sydney, NHMRC, and Murdoch Children's Research Institute's The Centre for Community Child Health, has delivered research findings which are contributing to improved service models, an extended reach, better health outcomes for rural and remote children, and a strong platform for advocacy and policy change.



**“ RFW is a not-for-profit with a commitment to early intervention and service access, providing developmental health services to children with complex needs in rural and remote Australia. Its multi-disciplinary teams supported over 5,500 children, families and educators in 2016/17, either on-site in Manly, NSW via telecare into schools and homes, or through community based programs.**

Royal Far West  
supports children's  
health, country-wide



**A dedicated research unit with a focus on collaborative research projects is playing an important role in propelling 94 year old charity Royal Far West (RFW) into the forefront of digital health and telecare.**

RFW is a not-for-profit with a commitment to early intervention and service access, providing developmental health services to children with complex needs in rural and remote Australia. Its multi-disciplinary teams supported over 5,500 children, families and educators in 2016/17, either on-site in Manly, NSW via telecare into schools and homes, or through community based programs.

RFW's long history belies a modern, evidence-based approach to service delivery, capacity building and advocacy. An organisational reform and refresh in 2012, led by CEO Lindsay Cane, made the commitment to demonstrating efficiency and effectiveness of all services. RFW began piloting its Telecare (aka telehealth) program in 2013 to expand its reach, with evaluation in partnership with University of Sydney. Since then RFW specialist paediatric developmental, behavioural and mental health services have been provided via telecare in over 120 rural and remote schools.

Research initiatives are now a strategic priority at RFW, with the internal team working closely with funding, academic and other research partners. This includes partnership on a five-year NHMRC funded research project led by Professor Mark Dadds through the Child Behaviour Research Clinic at the University of Sydney. This research focused on a randomised control trial of Access EI, an early intervention program for Conduct Disorders adapted for on-line delivery, compared to in-person delivery, which has shown positive results.

More recently RFW has partnered on a mixed methods evaluation of RFW Telecare (Telehanced) under a two-year NHMRC funded Translating Research into Practice (TRIP) fellowship. Led by Associate Professor Alexandra Martiniuk from the University of Sydney, embedded at RFW for the duration of this fellowship, Alexandra says 'I cannot overstate the value of having research so closely tied with real life, especially in the digital health space, where things are changing so rapidly' Kim Casburn, RFW's Head of Research and Service Innovation explains 'The RFW Research team is constantly improving the way that we translate new knowledge into practice. Our diverse partnerships play an important role in this process'.

## RESEARCH INFORMING PRACTICE AND POLICY

In 2016, recognising a gap in child development indicators for rural and remote areas beyond the Australian Early Childhood Development Census (AEDC), RFW commissioned the Murdoch Children's Research Institute's The Centre for Community Child Health to research the state of country children's health and

development in Australia. This resulted in the Invisible Children Report which has led to a series of town hall style meetings in regional communities to discuss the findings. Buoyed by the impact this research has had on decision makers, policymakers and funders, RFW has strengthened its research program and links to industry, population and clinical research and evaluation. Research-informed service design and delivery, as well as policy and advocacy priorities for system-wide change, are now fundamental to how RFW conducts business.

This body of work has led to a 2017 partnership with Charles Sturt University (CSU), commencing with a 12-month research and development project to build a business case for a National Paediatric Telecare Service. A separate partnership led by Southern NSW Local Health District (LHD) has been funded by the NSW Health Translational Research Grants Scheme, to be implemented in partnership with Murrumbidgee LHD and RFW. The Telehealth Approach to Getting on Track in Time (Got It!) aims to understand the feasibility of adapting an early intervention program for behaviour challenges for delivery via telehealth for rural and remote schools who may otherwise not receive this intervention.

## KEY RESEARCH THEMES

RFW's current research priorities focus on improved outcomes for children:

- Ensuring that existing RFW services are evidence based;
  - Creating new evidence demonstrating outcomes of RFW Telecare;
  - Early intervention for childhood mental health concerns;
  - Strategies to increase parental capability; and
  - Exploring the impact of early childhood trauma experiences.
- Underpinning research at RFW is the importance of an evidence base to support solutions for isolated communities which currently have little or no access to services. RFW's CEO, Lindsay Cane is determined to 'continue to explore, ask the hard questions and go to hard places in order to create solutions for children and communities that deserve the same service access as other Australians.'

More details on RFW's Research and Advocacy platform are available at [Royal Far West](#).

**Author: Edith Hurt, Policy and Advocacy Manager, Royal Far West**

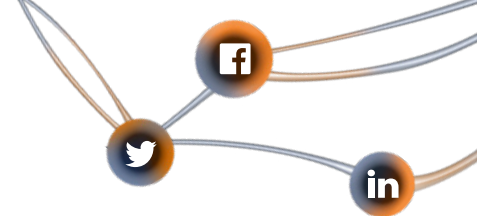


# RESEARCHER FOC REDUCING THE TH ANTIBIOTIC RESIST WINS BUPA HEALTH FOUNDATI



# FOCUSSED ON GREAT OF DISTANCE ON AWARD

Dr Amanda McCullough, Bond University Research Fellow, was announced as the recipient of the Emerging Health Researcher Award for 2017.







L-R: Dr Paul Bates, CMO Bupa ANZ, Chair Bupa Health Foundation Steering Committee, Dr Thushara Perera, Bionics Institute, Dr Rae-Anne Hardie, Australian Institute of Health Innovation, Macquarie University, Dr Bridianne O'Dea, Black Dog Institute, Dr Amanda McCullough, Centre for Research in Evidence-Based Practice, Bond University, Dr Emma Beckett, The University of Newcastle, School of Medicine and Public Health, Dr Jaqui Hughes, Menzies School of Health Research and Royal Darwin Hospital, Ms Annette Schmiede, Executive Leader Bupa Health Foundation

**The \$25,000 prize will go towards furthering Dr McCullough's research career, and help drive her crucial work that aims to stop the spread of antibiotic resistant bacteria by reducing antibiotic prescription among general practitioners (GPs).**

Annette Schmiede, Bupa Health Foundation Executive Leader said that the potential impact of Dr McCullough's work was huge.

"Dr McCullough's contribution in this area of research could be far reaching, and help us address a global health challenge. Ultimately, finding strategies to overcome antibiotic resistance can save lives – in Australia and around the world."

Antibiotic resistance happens when bacteria can resist being killed by antibiotics – medications that are used to help the body fight off bacterial infection.

"By 2050, around 10 million people each year could be dying because of antibiotic resistance" said Dr McCullough. The more antibiotics are used unnecessarily, the faster the world will be overcome by bacteria that no longer respond to our medicines.

Her research has shown that Australian GPs prescribe nearly 6 million antibiotics annually, which Dr McCullough has demonstrated is 4 to 9 times higher than what is recommended by Australian guidelines.

As part of her research, Dr McCullough has been reviewing the evidence on why GPs and members of the public use antibiotics, and how this could be reduced for common conditions such as coughs, colds, the flu and ear infections.

To help change prescribing behaviour, she is also involving a psychologist in her work. "It's different to what's often done in these things. So, I guess that is where my work is quite different in that I've set the benchmark, and now I'm trying to close the gap."

Dr Chris Del Mar, Professor of Public Health at Bond University, nominated Dr McCullough for a Bupa Health Foundation Emerging Health Researcher Award in recognition of her driving ambition, hard focus and potential.

### **MORE INFORMATION ON THE BUPA HEALTH FOUNDATION AND EMERGING RESEARCHER AWARDS**

The Bupa Health Foundation is one of Australia's leading corporate foundations dedicated to health. We are committed to improving the health of the Australian community and ensuring the sustainability of affordable healthcare through collaborative partnerships.

The Bupa Health Foundation was established in 2005 and has invested more than \$30 million to support over 120 projects in real health and care improvements.

The Emerging Health Researcher Awards is celebrating its sixth anniversary after being established in 2012.

For more information please visit [www.bupa.com.au/about-us/bupa-health-foundation/about](http://www.bupa.com.au/about-us/bupa-health-foundation/about)



**“Dr McCullough’s contribution in this area of research could be far reaching, and help us address a global health challenge. Ultimately, finding strategies to overcome antibiotic resistance can save lives – in Australia and around the world.”**



Professor Del Mar said the importance of Dr McCullough’s research lies in the seriousness of antibiotic resistance, and the potential harm it could cause people all around the world.

“If we can’t be sure that antibiotic cover is effective then all of our lifesaving treatments – hip replacements, chemotherapy for cancer, stents in the heart – will be too dangerous to do. Medicine will be retreating back to the 1930s,” said Professor Del Mar.

The prize money from this prestigious award will allow Dr McCullough to expand her work to change antibiotic prescribing practices nationally.

“To my mind, there is actually no point in doing research if you can’t get it into practise so that it improves health. So, that’s really my driving force, I guess,” adds Dr McCullough.

“The Bupa Health Foundation is proud to recognise the work of early career researchers who are not only doing important research, but are also focused on translating the results to ensure improvement in the wellbeing of the community”, said Ms Schmiede.

In addition to Dr McCullough, five additional outstanding health researchers have been acknowledged as finalists and have been awarded \$5,000 to continue their research that is driving changes in health policy and practice in Australia.

**Alana Fisher, Operations Manager, Bupa Health Foundation**

## **BUPA HEALTH FOUNDATION 2017 EMERGING HEALTH RESEARCHER AWARD FINALISTS**

**Dr Amanda McCullough, Centre for Research in Evidence-Based Practice, Bond University**

**Area of research:** ‘Reducing antibiotics prescribing in general practice’

**Nominator:** Dr Chris Del Mar, Professor of Public Health, Bond University

**Dr Bridianne O’Dea, Black Dog Institute**

**Area of research:** Using technology and social media to identify, treat and prevent mental illness and promote wellbeing in youth

**Nominator:** Professor Helen Christensen, Chief Scientist, Director, Black Dog Institute

**Dr Emma Beckett, The University of Newcastle, School of Medicine and Public Health**

**Area of research:** Gene-nutrient-environment interactions

**Nominator:** Associate Professor Mark Lucock, Associate Professor and Program Convenor (Food Science and Human Nutrition)

**Dr Jaquelyne Hughes, Menzies School of Health Research and Royal Darwin Hospital**

**Area of research:** Reducing rates of chronic kidney disease (CKD) in Indigenous communities

**Nominator:** Professor Alan Cass, Director of Menzies School of Health Research

**Dr Rae-Anne Hardie, Australian Institute of Health Innovation, Macquarie University**

**Area of research:** Enhancing quality of pathology testing in general practice

**Nominator:** Professor Andrew Georgiou, Head of Diagnostic Informatics, Australian Institute of Health Innovation, Macquarie University

**Dr Thushara Perera, Bionics Institute**

**Area of research:** Precise instrumentation to measure hand tremor, balance, posture, rigidity, and gait in movement disorder patients

**Nominator:** Professor Hugh McDermott, Neurobionics Research Program Leader, Chief Technology Officer, Bionics Institute



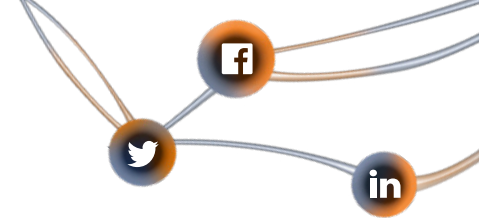


Associate Professor Fabienne Brilot-Turville and her team, University of Sydney, Children's Hospital at Westmead

# HUMANISING RESEARCH PROVES ENGAGING FORMULA FOR MS RESEARCH AUSTRALIA

In Australia the month of May is all about multiple sclerosis, largely due to the wildly popular Kiss Goodbye to MS campaign, championed by MS Research Australia. The campaign has been so successful at raising the profile of MS that it has won awards including the Most Effective Campaign from the Fundraising Institute of Australia.





**W**orld MS Day – officially marked on May 30th – is the international campaign to raise awareness of MS. It is led by the MS International Federation (MSIF), a unique global network of MS organisations of which MS Research Australia is a member.

The significant day is the MS movement's annual campaign to raise awareness of the condition and to support and connect the 2.3 million people living with the disease worldwide. It's a day to celebrate global solidarity and hope for the future. This year, the campaign is called 'Bringing Us Closer' and the theme was Research.

MS Research Australia united with MSIF in devising a communications strategy that brought the research community firmly into the spotlight throughout May. Australia's best and brightest minds in the field of multiple sclerosis research were placed centre stage to highlight and celebrate their ongoing achievements and demonstrate the importance of further investment in research.

Primarily utilising social media, a comprehensive suite of campaigns was rolled out, including an evocative and beautifully shot series of videos that capture the heart and soul of the MS research community via the voices of eight researchers – Associate Professor David Booth, Associate Professor Scott Byrne, Associate Professor Fabienne Brilot-Turville, Dr Chris Dwyer, Dr Carlie Cullen, Dr Vilija Jokubaitis, Dr Tobias Merson and Dr Anne Bruestle.

Each video focused on one central question for each researcher, probing why they chose the field of research, why it's important to undertake research and even what they would want to say to someone newly diagnosed with MS. A clear message of hope and commitment to solve this disease is sent to the MS community and certainly the content would appeal to donors right through to a person newly diagnosed with MS.

**“On the other end of the scale is the Battle of the Labs social media campaign. Launched on Red Lab Coat Day on May 1, nine labs around Australia each created a video that was an artistically interpretive representation of their research. Productions included rap renditions, elaborate playacting, animations and dance numbers. The audience were encouraged to vote for their favourite video, with the winner being announced on World MS Day.”**

The video clips are light-hearted, catchy and undeniably 'out of the box' and have proven to be a highly effective way to engage a younger audience, whilst also profiling the vital and varied work of the MS researchers.

The communications strategy has very much been one of storytelling, a style the organisation is finding successful in humanising and democratising the content, allowing it to be highly engaging. 'People care about people' is a central tenant to their storytelling style and it serves the organisation well.

**“MS remains a challenging condition in our community, placing a very significant toll on younger Australians where it is most frequently diagnosed. It also brings a heavy burden in cost to manage it – close to \$2 billion annually in fact,” explained Petricia Augustus, Head of Communications MS Research Australia. “Our own communications strategy works to ensure it is higher on the community radar and ultimately receives the attention it needs through research efforts to better understand and manage this complex disease.”**

Over the last 18 months, MS Research Australia have invested a considerable amount of time conducting surveys and focus groups to determine the types of information their various stakeholder groups want to learn from the organisation but also the best ways to convey those messages.

“We thoroughly canvassed our MS community – from the philanthropists and donors, to the science and research teams and of course the people living with MS and the people that support them,” explained Petricia, “I believe it's given us a robust platform to create pieces that tell a story – and a story that sticks at that.”

Whilst this May held the theme of “research” in the MS community, the irony of storytelling process is that it isn't rocket science. However MS Research Australia have cracked a great formula for creating collateral that transcends across stakeholders by putting the researchers firmly in the spotlight.

**Author: Jillian Kingsford Smith** has worked internationally as a journalist, turning her hand to writing books in 2012 when she was diagnosed with MS at the age of 42. She is a MS Research Australia advocate and best-selling author.



## THE LAST WORD

# DIGITAL HEALTH IS CERTAINLY THE WAY OF THE FUTURE.

New opportunities are emerging in this space every day, from the bigger ticket items like artificial intelligence through to using more efficient ways to deliver healthcare and really harness the power of data as a true national resource. Both state and federal governments are investing in digital health futures. A recent investment by the federal government of \$55 million to a Digital Health CRC. To highlight some of the opportunities this investment might yield, we asked Elizabeth Foley (Bid Manager of Digital Health CRC) to tell us what this means.

## CAN WE AFFORD OUR LONGER LIFE EXPECTANCY

Australians have one of the highest life expectancies on the planet and our roads and workplaces are safer than they've ever been. But if you watched ABC's 'Four Corners' last week, you may be feeling a bit worried about how much 'out of pocket' expense you may face if you got sick, injured or are just managing the wear-and-tear of aging. So while your doctor may be predicting you'll live until you are 90, your accountant may say you can only afford to live to be 75! Living longer brings with it a greater risk of chronic and degenerative diseases which are difficult and expensive to manage and treat. Half of us currently have one or more chronic conditions. If we're over 65 then 30 per cent of us have three or more chronic conditions.

Australia's annual health expenditure has passed \$170 billion which is more than 10 per cent of GDP. Clearly it's not just rising out-of-pockets for us as individuals, but for the government and insurers as well!

Our health system is far from transparent, so finding the most appropriate treatment and specialist at the best price in the right place and right time very hard for most of us!







## DIGITAL TRANSFORMATION IS PART OF THE SOLUTION.

Digital technologies have transformed how we work, travel, shop and socialise. Now it's health's turn. Digital Health could improve health outcomes and reduce costs by turning data into information, creating system transparency which will:

- ◆ Empower consumers in the management of their own health and help them make better informed decisions
- ◆ Assist GP's and specialists to better advise their patients, and measure their own performance
- ◆ Allow governments, to make more informed and nuanced health policy
- ◆ Enable insurers to design better products and systems, and keep the cost of insurance from rising so much
- ◆ Develop and grow the new digital health technology industry in Australia, creating jobs, growth and exports.

But governments around the world have struggled the complexities of implementing digital health. How, for example, do you get meaningful information from health data without compromising privacy? In Australia the web of state and national legislation impacting on health records is challenging and there are legislative blocks to linking key data such as medicare records and prescription records.

The new Digital Health Cooperative Research Centre was selected for funding by the Federal Government this year to take address these difficult issues facing the health system and at the same time to take advantage of the expected 26% annual growth in the international digital health industry, a market predicted to reach \$379 billion by 2024 (Hendersen et al -2016).

## HOW WILL THE CRC OPERATE

The Centre's 80-member organisations represent almost every segment of the health system from patient to community, hospital to insurer, start-up to big government. Researchers from 16 university partners will work with our health partners to develop and test solutions that work for real patients in real hospitals and in the community. And our business partners will work alongside them to ensure that the solutions are scalable and implementable. We'll develop them in Australia, then take them to the world.

The Digital Health CRC will have at least \$111 million in cash funding, and \$118 million in-kind funding to invest over its seven-year life. We are at the embryonic phase of registering constitutions, setting up bank accounts and board and developing formal agreements. There is a lot of set up work to do before we can even begin to receive the Government Grant. We are concurrently developing outlines of the potential detailed research themes from conversations with and surveys of our partners to date. Collaborative work streams are likely grouped under different settings of care, such as acute, primary, aged care and rehabilitation, as well as across topics such as medication management and chronic disease.

Elizabeth Foley  
Bid Manager Digital Health CRC  
Former CEO of Research Australia, 2011-2015



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# RESEARCH AUSTRALIA

CONNECTING • ENGAGING • INFLUENCING

