# UQmedicine

A FACULTY OF MEDICINE MAGAZINE | WINTER EDITION 2017

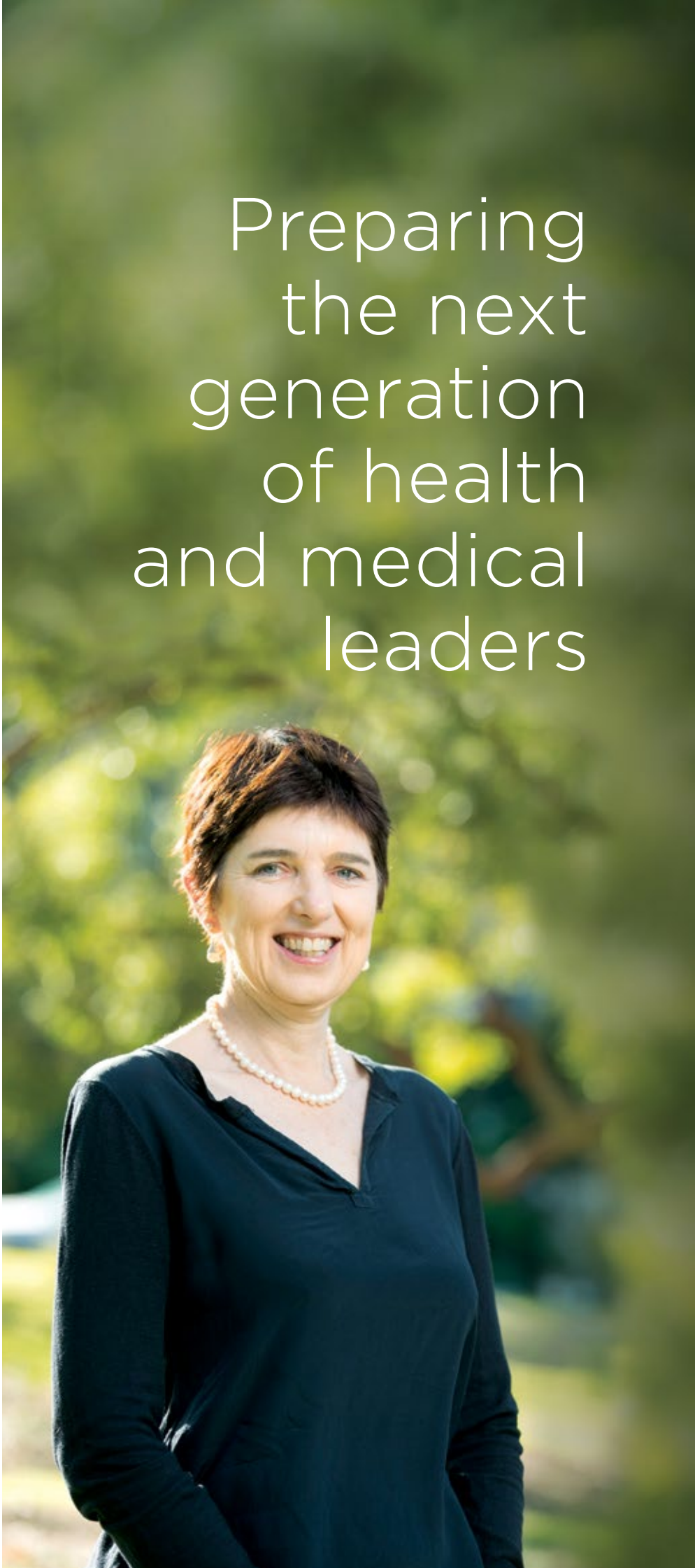
## When the student becomes the teacher

Medicine on ice

Arresting the spread of breast cancer

On track for a storybook career

# Preparing the next generation of health and medical leaders



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The University Of Queensland AUSTRALIA | Faculty of Medicine

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**COVER IMAGE**
UQ's 2016 Bachelor of Medicine, Bachelor of Surgery Valedictorian Rachel Colbran at the Princess Alexandra Hospital for her internship year.

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## At UQ we are uniquely positioned to educate and train the next generation of health leaders.

The Faculty of Medicine links pre-clinical and clinical sciences with population and global health. Having this educational pipeline lets us make significant contributions to Australia's healthcare system. As educators, an ongoing challenge is to ensure that the learning environment we provide our students will support their transition to a workplace where change is the only constant.

I can remember the first day of my MBBS degree at the University of New South Wales in the early '80s as if it were yesterday. Every seat in the lecture theatre was taken. There were no laptops on the desks, no PowerPoint, and I certainly couldn't listen to the pre-recorded lecture on my phone on the way to uni. It was a vastly different educational landscape, and it's an environment that will continue to see dramatic change. We are at a point where our methods of learning are in many ways foreign to that of our students. This difference can cause friction.

Imagine you're a busy hospital doctor rushing to UQ to give a lecture. You've crammed in the afternoon of patients and arrived at the lecture theatre expecting a reception somewhat akin to an Adele concert. But only 10 students sit in the back three rows of a 500-person lecture theatre. Perhaps a few more online. You rush through the lecture content, and leave irritated, muttering about the work ethic of students: "Didn't happen in my day – this explains why junior doctors don't know any anatomy or [insert favourite discipline]". For some of us, this isn't too far from the truth, and the result – a potential strain to well-established (and future) partnerships.

Now imagine an alternative model. Limited seating for a live lecture, say 50 seats in a room, which students reserve in advance. Everyone else is watching online or saving it on their phone for later viewing.

The concept would have seemed inconceivable 10 years ago, but is one of the many alternatives being floated in 2017. The tried and trusted models are being flipped, and as educators we need to consider these new opportunities with an open mind.

Another modern model is the idea of students as partners – meaning we harness student and staff creativity via collaborative partnerships with a view to enhanced teaching and learning – a two-way knowledge and skills transfer where both parties are learning. The relationship between RHD students and supervisors is a worthy demonstration of this ideas exchange – a bright, young and enquiring mind, paired with a seasoned supervisor whose love of science is fuelled by students. But this is a one-to-one relationship. We need to be able to scale it. How can we recreate this across an entire cohort?

The concept of 'reverse innovation' comes from business literature. The basic premise is that a company needs to overcome its dominant logic, the institutionalised thinking that has always guided its actions. In the ever-changing world of medicine and research, it's a concept we can't afford to ignore. The challenge will be implementing a model where there is a two-way exchange of ideas between students and teachers.

Maintaining and improving our position as a leader in health and medical education hinges on our ability to innovate and adapt to the changing environment. While we don't know what the future of education will look like, we do know the landscape is changing – and UQ is committed to being part of that changed future. The change is in the interests of our students, teachers and ultimately our community.

**Professor Robyn Ward AM**
Acting Executive Dean
Faculty of Medicine

# Features

> "Our focus should be on preparing the next generation of doctors to become the global leaders of today and tomorrow."

# Pushing the boundaries to improve patient and population health

**Professor Stuart Carney**
Medical Dean

UQ medical graduates must be effective from their first day as interns, while adapting to changes in healthcare needs throughout their careers.

That is the key message from UQ's new Medical Dean, Professor Stuart Carney.

"Our focus should be on preparing the next generation of doctors to become the global leaders of today and tomorrow," Professor Carney says. "I want them to be lateral thinkers who are capable of pushing the boundaries to improve patient and population health."

As Medical Dean, Professor Carney provides academic leadership for the MD Program. Originally from the north of England, Professor Carney graduated from Edinburgh University Medical School and trained as a consultation-liaison psychiatrist at Oxford.

"While at Oxford, I became interested in clinical epidemiology and began to appreciate the potential impact of medical education as a complex intervention to improve patient and public health," says the new Medical Dean.

This interest in medical education took Professor Carney into the field of public policy. He helped the United Kingdom Health Departments to develop a new integrated academic training pathway for medicine, and a standardised two-year internship. The internship, known as the Foundation Programme, now forms the bridge between medical school and vocational training in the UK.

Prior to joining UQ, Professor Carney was the Medical Dean at King's College London, overseeing the largest MBBS program in the UK, where he led a major turnaround to transform the student experience and curriculum.

"I am absolutely delighted to have joined the team at UQ," says Professor Carney. "The Faculty's commitment to academic excellence and international impact captivated my interest during the application process for the Medical Dean role."

Since arriving, Professor Carney has begun to fully understand how talented students are realising UQ's global leadership ambitions.

"The University of Queensland Medical Society, in particular, has made me feel welcome and it is great to see the breadth of their activities to help build a sense of community in the medical program."

Professor Carney will also serve as Deputy Executive Dean, and work as part of the Faculty executive team dedicated to ensuring a world-class comprehensive and integrated medical program.

# A clear and unequivocal strategy

**Professor Sean Emery**
Research Dean

'Impact' is a word often uttered by Professor Sean Emery, the Faculty of Medicine's inaugural Research Dean. Professor Emery is focused on building on the Faculty's international reputation for research that makes a difference.

Among his priorities is the development of a new strategic plan emphasising impact as being at the heart of the Faculty's research environment: impact in individuals, in populations and in patient care and service delivery within health care systems – locally, nationally and internationally.

"Better treatment for patients is the most discernible measure of impact," Professor Emery says. "But how we prevent disease from occurring and how we better deliver health services to meet needs are important measures also. The focus has to be the integration of UQ's world-class biomedical research people and infrastructure with clinical care to generate quality scientific evidence and healthcare outcomes."

Professor Emery's role includes managing the development, coordination, performance and translational outcomes of the Faculty's research centres and institutes. "We have a dynamic and rapidly evolving external funding environment. We need to be best positioned to respond proactively to the challenges of that setting. Having a clear and unequivocal strategy in place is vital."

Professor Emery completed his Bachelor of Science (Hons) in Applied Biology and PhD in Biochemistry in the UK, where he also worked in the pharmaceutical industry for several years. He has more than 20 years of research leadership at The University of New South Wales, including as Deputy Dean (Research) with the Faculty of Medicine, and Head of the Therapeutic and Vaccine Research Program at the Kirby Institute.

UQ's reputation and the appeal of the new role attracted Professor Emery to Queensland. "The university is highly regarded internationally, particularly for its biomedical enterprises," he says. "On a personal level, this was an enormously appealing opportunity to satisfy my ambition. While we are bedding down a new structure in the organisation, I'd like to go about an orderly transition to the development of a clear and engaging strategic plan with which to achieve research impact within the Faculty of Medicine."

Professor Emery also serves as Deputy Executive Dean of the Faculty.●

# Translating scientific discoveries into game-changing therapies

**Professor Paul Clarke**
Director, UQ Diamantina Institute

Swapping the east of Scotland for sunny Queensland, Professor Paul Clarke is the new Director of The University of Queensland's Diamantina Institute (UQDI). With a background in cancer cell biology research and a career spanning more than two decades, he brings a wealth of research leadership to the institute.

Joining UQDI from the University of Dundee School of Medicine, where he filled the roles of Associate Dean and Head of Research, Professor Clarke is set to reinvigorate UQDI's research programs and recharge the institute's overall strategic direction to focus on impactful translational research.

Professor Clarke says he looks forward to leading UQDI in continuing its ground breaking research into understanding the molecular and cellular basis of disease, and translating this research into innovative new treatments for patients.

"UQDI has a unique and collaborative research environment with strong connections to clinicians and patients," says Professor Clarke. "I'm excited to lead some of the best medical researchers in the world, and to help them translate their scientific discoveries into game-changing therapies and medical treatments.

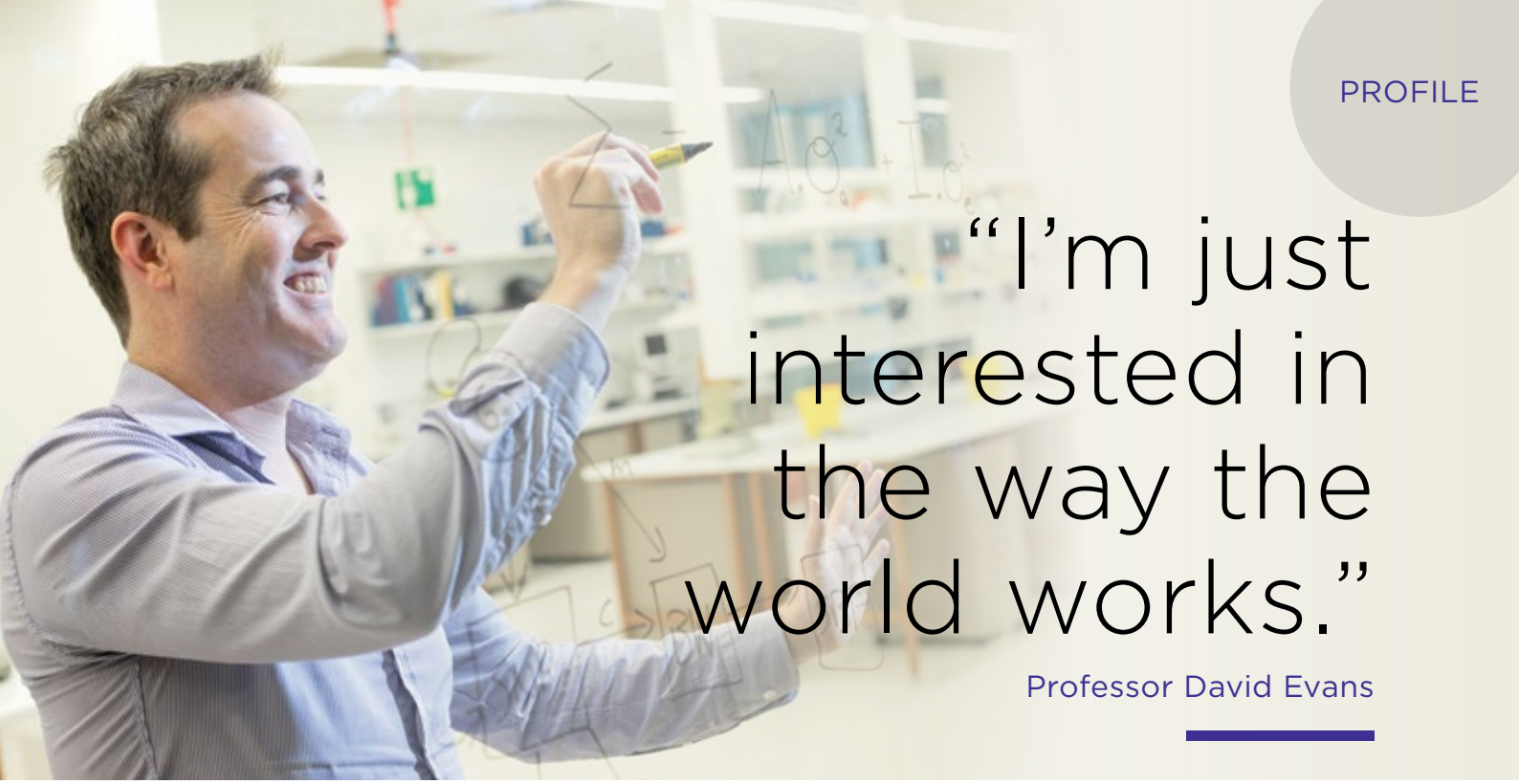
"UQDI has a reputation as an international leader in cancer and chronic disease research. With conditions like diabetes, arthritis and skin cancer on the rise around the globe, it is imperative that we link the pre-clinical and clinical science to healthcare and patient outcomes."

Professor Clarke completed his undergraduate studies in biochemistry at the University of Bristol. This was followed by a PhD at the University of Dundee, where he later became a senior lecturer and was awarded a personal chair in 2005.

Professor Clarke has spent most of his career in the United Kingdom and Europe. He has been part of Dundee's School of Medicine for the past 18 years and previously he worked at the University of Manchester and the European Molecular Biology Laboratory in Heidelberg.

A keen Arsenal supporter, Professor Clarke is looking forward to exploring Brisbane and contributing to the development of local and international research collaborations.

"UQDI has a unique and collaborative research environment with strong connections to clinicians and patients," says Professor Clarke.



# “I’m just interested in the way the world works.”

Professor David Evans

As a child, David Evans dreamt of becoming a park ranger or professional tennis player. But a love of science and mathematics led him down a very different path. Today, David Evans is Professor of Statistical Genetics and Chair Head of Genomic Medicine at UQ’s Diamantina Institute.

Coming from a long line of scientists and clinicians, this self-confessed ‘wet lab hater’ arrived in the field of genomics quite by accident. After visiting his honours supervisor for a cup of tea and a catch up, his eyes were opened to an emerging area of medical science – where statistics and genetics played a revolutionary role in cutting-edge research.

Astounded that such research could be performed outside a lab, and excited by the prospect of combining medicine with maths and statistics, Evans found himself in a field of research perfectly suited to his interests and skills.

“I’ve always been interested in how things work, and the area of statistical genetics provided the perfect forum for that passion,” the professor says. “First you need to understand how the mathematics underlying the method works. Then you apply the maths to the biology, and this in turn provides clues on how the disease arises.”

Using genome-wide association and next generation sequencing approaches, Professor Evans is currently working on a number of major projects to find genes that contribute to the risk of complex diseases such as osteoporosis, eczema and septic shock.

He recently received two project grants from the NHMRC to investigate whether viruses may trigger autoimmune disease, and to identify genes which increase the risk of ankylosing spondylitis – a type of arthritis affecting the spine.

“These are diseases that are common in the population,” explains Professor Evans. “They’re due to hundreds of different genes and environmental factors all acting and interacting together. We look at people’s genes – thousands and thousands of individuals – and identify genes that tell us something about the underlying biology of the condition. This approach has revealed to us things that we never knew about certain diseases. It’s been paradigm changing.

“Occasionally you get lucky and find a gene that subsequently becomes a drug target. This is happening more and more now, which is very exciting. The pharmaceutical industry is actually taking these genes forward and targeting them pharmacologically. We’re starting to see new drugs on the market and also existing drugs being repositioned to treat other diseases. This effectively short-circuits the drug development process so you don’t have to do pre-clinical models or phase one trials. You can go straight through to phase two and three clinical trials, which can save tens of millions of dollars.”

Of course, such impressive developments aren’t without hurdles. Evans concedes that the field of genomics faces a number of challenges – namely the ‘missing heritability problem’ and the rapid development of technology.

“We’re detecting all these genes that are important in diseases, but when you add up their combined effect, they only explain a very small proportion of the overall risk of disease. And so, the question is: where is the missing heritability? Also, technology is advancing at record speed. This creates challenges around how we analyse data, if it can be done in a more cost-efficient manner, and how we get that information into the clinic.”

Although these are big questions, they aren’t slowing Professor Evans down. He remains focused on ensuring his projects run smoothly and has achieved some ground-breaking results. Despite making the 2015 and 2016 Thomson Reuters Highly Cited Researchers list for his research into molecular biology and genetics, Evans remains refreshingly honest when asked what he loves most about his job.

“It’s wonderful to discover things that nobody else has before and it’s exciting to think that some of your discoveries will have an impact and make people’s lives better. But more fundamentally than that, I’m just interested in the way that the world works and I enjoy learning. I’ve also got a fantastic team and would be far less without them.”

# Arresting the spread of breast cancer

Thanks to early detection and advances in treatment, breast cancer survival rates have improved significantly in recent years. However, existing therapies have limited benefit if the disease metastasises or spreads to other sites in the body.

Breast cancer metastasis to the brain causes considerable morbidity and is inevitably fatal, with patients typically surviving four to eighteen months from diagnosis. Researchers at UQ's Faculty of Medicine are combining their world-leading expertise in a multifaceted approach to try to improve that outlook for patients.

Head of the Molecular Breast Pathology team at UQ's Centre for Clinical Research, Professor Sunil Lakhani, says it is clear we need to be more innovative in our approach to treating these brain tumours – because they resist existing therapies. "An idea gaining support in the biomedical community is to simultaneously target cancer cells and the so-called 'tumour microenvironment', which we are now learning can provide critical support to growing cancers."

Professor Lakhani's team collaborates with scientists around the globe to tackle important and complex questions about breast cancer development at the molecular and cellular level. For their latest project, they have joined with UQ's School of Pharmacy to develop cutting-edge research into the spread of breast cancer to the brain.

The three-year study builds on previous research suggesting the movement of calcium in cells goes awry in both primary breast cancers and in metastatic tumours in the brain. Understanding how these processes are altered in breast cancer could lead to new ways to reduce the chance of the disease spreading, and arrest the growth of metastatic tumours once they are detected.

The US Department of Defense has committed more than A$1.3 million to the project through its Breast Cancer Breakthrough Scheme. This is the only research outside North America to receive such funding.

Working alongside Professor Lakhani to improve breast cancer management and survival rates for women is Dr Jodi Saunus. The multidisciplinary researcher is leading a new clinical trial – 'BoNSAI'. The study is expected to provide major advances in understanding the dose of drugs needed to target tumours in the brain.

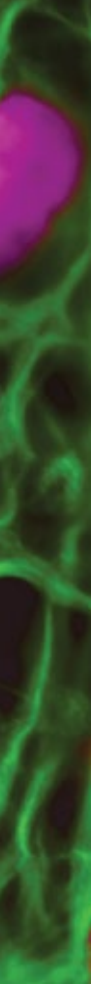
The brain is normally protected from intravenous drugs by unique, impenetrable blood vessels. While the vessels that grow through tumours are 'leakier' than the rest of the brain, they are still not as permeable to drugs as blood vessels elsewhere in the body.

The degree to which this blocks the effects of cancer drugs in metastatic brain tumours is hotly debated in scientific literature.

By using cutting-edge medical imaging – made possible by the launch of the Herston Imaging Research Facility – the BoNSAI study will determine how much of a drug administered to breast cancer patients is absorbed into metastatic brain tumours.

"We will attach a PET tracer to a drug routinely used to treat breast cancer," Dr Saunus explains. "Participants will then undergo two to three scans over the following week or so. These scans will enable us to see how much of the administered drug actually reaches the tumour and is retained there. Then we can better understand the factors that control this, such as the patterns of blood flow and pressure inside the tumours.

"It is possible that drugs we thought were not working in the brain could be effective if used in higher doses to overcome the unique barriers to drug uptake. Quality-of-life for people living with brain tumours can be incredibly poor, so there is a great need for research to improve both manageability and survival rates."



*Right: Dr Peter Simpson. Below: Dr Jodi Saunus, Dr Amy McCart Reed and Professor Sunil Lakhani.*

The research team is hoping to clarify speculation in scientific literature by providing the evidence for guidelines on dosing. This could also provide benchmarking for treatment of metastatic brain tumours originating from cancer types other than breast cancer, such as lung cancer and melanoma.

Much of the group's research has been made possible by Professor Lakhani's establishment of the Brisbane Breast Bank (BBB) when he moved to Australia from the United Kingdom 12 years ago. The BBB aims to collect a tumour sample from every patient undergoing treatment at the Royal Brisbane and Women's Hospital. It has become a valuable resource for breast cancer research in Australia and abroad.

Molecular genetics specialist, Dr Amy McCart Reed, coordinates the BBB in addition to her research portfolio.

"A number of our discoveries would not have been possible without the valuable samples donated by breast cancer patients," Dr McCart Reed says. "Metastatic brain tumours in particular are not easy to come by."

BBB samples have supported the ground breaking research into breast cancer genomics, undertaken in collaboration with the International Cancer Genome Consortium. Centre for Clinical Research Team Leader, Dr Peter Simpson, has published several high impact research papers defining the breast cancer genome, together with collaborators at the Wellcome Trust Sanger Institute in Cambridge. In particular, new research investigating mutational signatures has the potential to identify a subgroup of patients who might benefit from additional therapies.

Professor Lakhani says the study has identified a much larger patient group who could benefit. "It could be an effective way of picking those patients where particular treatments are going to work – and that's a big step forward in cancer research."

Professor Lakhani holds an appointment with Pathology Queensland, and was recognised with the 2016 Robert Sutherland Award for Excellence in Translational Research from the ANZ Breast Cancer Trials Group.

"I've been fortunate to lead and work with some amazing research teams. We've come a long way in improving women's health outcomes."

# Medicine on ice

## Dr John Cadden discusses the unique challenges and rewards of working with the Australian Antarctic Division's Polar Medicine Unit.

1975 Alumnus Dr John Cadden has a longstanding association with the Australian Antarctic Division (AAD). He first joined the RV Aurora Australis as the ship's doctor on a winter research voyage to the Mertz Glacier Polynya in East Antarctica in 1999.

Nearly two decades later, Dr Cadden's love affair with the ice continent is still going strong. The intrepid physician reflects fondly on that first voyage.

"It was a truly life-changing experience," recounts Dr Cadden. "It incorporated all the aspects of medicine and adventure, with the challenge of applying my skills in an isolated situation. All while surrounded by world-leading scientists and support personnel.

"I've now completed seven engagements with the AAD, including two winters. This extended time away from home has been magnificently supported by my wonderful family and partner, Dr Shar Edmunds, who graduated in the same year."

Dr Cadden's interest in Antarctica started early, and may be attributed to the 1950s Queensland School Reader, with its accounts of Scott and the 'Heroic Era of Antarctic Exploration'.

"In the late 1990s, the AAD's Polar Medicine Unit still had personnel who touched upon this early exploration and development," says Dr Cadden. "I found their stories enthralling – the need for improvisation using basic equipment."

Australia supports three stations in Antarctica – Mawson, Davis and Casey – and another on the subantarctic Macquarie Island, or Macca, which is about halfway between New Zealand and Antarctica.

"Once you reach Antarctica, all the Australian stations have medical facilities of the highest standard," explains Dr Cadden. "They provide all medical, surgical, dental, pathology and investigative ability.

"The Australian ethos is to supply doctors trained to provide the necessary care. Evacuation can be a complicated and lengthy process, and impossible in winter. Other national stations aim to evacuate patients. The limitations of their facilities and transport in the winter can have serious or even fatal consequences.

"Our medical personnel and equipment often provide a referral hub for other countries during emergencies. To achieve these standards, the Polar Medicine Unit goes to great effort during the training period to provide the necessary skills."


"For me there is no medical position in the world which gives such a broad and life changing experience in the most exquisite and challenging environment."

All Australian National Antarctic Research Expedition participants are carefully medically screened prior to deployment. Doctors who are wintering at Australian Antarctic stations are required to have their appendix removed.

"On a day-to-day basis, all the normal general practice problems present," says Dr Cadden. "In addition, falls on the ice, fractures and musculoskeletal strains are common. Dental work is more common than you would expect – think minus 30, a deep breath and amalgam fillings!"

As Dr Cadden explains, the isolation of a winter expedition presents unique psychological challenges.

"Summers are filled with enthusiastic, happy, often first-time expeditioners. In the winter, isolation depletes immune factors and latent viruses can present without a new virus being introduced into the station. Now that expeditioners can travel more frequently by plane, viruses can present within the incubation period."

Dr Cadden says station doctors must broaden their knowledge and skills to work in the extremely well-equipped facility. Being an integral member of the base community is also vital.

"Reading the community, catalysing interpersonal relationships, negotiating and counselling so that the community functions to achieve its work and scientific goals are an important part of the position.

"Since you are living in close quarters with your patients, medical and relationship issues are very important. Any breakdown in relationship may remove an expeditioner's access to the only doctor. In the past, this has had disastrous consequences, so you are never off duty.

While the hours are long and the environment can be unforgiving, Dr Cadden is quick to recognise how fortunate he is to have experienced life on our southern polar continent.

"As long as we maintain radio contact and can return to station quickly, we're allowed to be off-station to enjoy the extraordinary environment. This can mean visiting the safety huts dotted around the immediate area, travelling on stable sea ice, visiting the grounded iceberg galleries, hiking on Macca, camping out or visiting penguin rookeries. There is no shortage of exciting, visually stunning activities.

"Life on the station is as good as you make it. All stations have hobby huts with appropriate tools. There is no shortage of coaching from experienced tradespeople. Maintaining fitness and agility is important and supported by well-equipped gymnasiums, volleyball courts and cross-country skiing in the summer. And, of course, photography is captivating.

"For me, there is no medical position in the world which gives such a broad and life-changing experience in the most exquisite and challenging environment. Each trip maintains my enthusiasm for general medicine and drives my desire to stay up-to-date."

*For more information on the Australian Antarctic Division, and to get involved, see:* ***antarctica.gov.au.***

# When the student becomes the teacher

What do the best and brightest of UQ Medicine do when they leave the historic sandstone campus? Some, like Rachel Colbran, end up sharing their knowledge with the next wave of wide-eyed medical students.

Rachel was one of UQ Medicine's passionate 2016 graduands and class valedictorian who, aside from maintaining an impressive GPA of 6.94, also received a myriad of awards, was actively involved in student life and published photos in the Medical Journal of Australia.

Now spending 2017 at the Princess Alexandra (PA) Hospital for her internship year Rachel has started teaching second year UQ medical students as a clinical coach and is enjoying passing on her knowledge to others.

"This is the first hospital experience these students have, and it has been really rewarding to lead them to new patients each week and teach them about clinical examination, physical markers of disease and treatment approaches," Rachel said.

"I remember my own clinical coaches from second year medical school very well, and continue to see them around the hospital even now.

"It is almost surreal to have now stepped into their shoes and be teaching my own students. I will always remember that feeling of trepidation when I was asked to examine my very first patient in front of a group of my peers.

"I try my best to encourage my students to be fascinated about medicine, and enjoy learning about new things from kind patients in a non-threatening environment," Rachel said.

Now living in Brisbane, Rachel spent five years in Armidale in rural New South Wales, and dreamed of becoming a vet. A cat allergy stopped that career before it began, and she started entertaining ideas of medicine.

It was when a family member struggled with cancer that she chose medicine and surgery to apply her love of science to helping others.

"In late high school one of my close family members was diagnosed with cancer, and witnessing first hand the struggle she went through motivated me to study medicine.

"Medicine appealed to me in several ways knowing I would be able to help others, I loved science and I would always be learning," Rachel said.

> “Studying medicine has been one of the most rewarding things I have ever done and I look forward to developing my knowledge, and sharing it with others to continue my career in medicine and research.”

That passion for learning and education has clearly paid off for Rachel who aside from her hope of a career in surgery, plans on pursuing medical research.

“I am very interested in research and plan on being actively involved in research both now and in the future,” Rachel said.

“There are infinite medical discoveries to be made, and I am excited to be living in such an age where we are becoming closer to curing previously lethal diseases.

“I am grateful to be living in Brisbane, which is home to numerous world-class research institutes, many of which are associated with UQ.

“I am very attracted to pursuing a career in surgery, and not only becoming proficient at performing existing surgical procedures, but also developing new surgical procedures and technology to enable better patient outcomes,” Rachel said.

Currently working towards publishing a research paper with the Australian Red Cross Blood Service, Rachel clearly isn’t fazed by the busy hospital lifestyle.

“It’s been great, everyone at the PA has been amazingly supportive and all the interns really stick together and encourage each other,” Rachel said.

“The registrars in my general medicine round have been such lovely people and make work rewarding and fun.

“I loved medical school but as a student you work in the hospital but then you have to go back and study and you don’t see the full picture.

“Now working full time you really build relationships with patients and can see the difference we can and do make on a day to day basis.”

With the rest of 2017 to see out as an intern, Rachel looks forward to working as a clinical coach and helping students whenever she can.

“Studying medicine has been one of the most rewarding things I have ever done and I look forward to developing my knowledge, and sharing it with others to continue my career in medicine and research.”

No doubt we’re in safe hands with young doctors like Rachel at the helm of our medical workforce.


*Professor Darrell Crawford presents Rachel with the Elsie Butler Wilkinson Memorial Prize in Obstetrics and Gynaecology, generously funded by Professor Herbert John Wilkinson*

# Infection study highlights health gap for Indigenous children

When Prime Minister Malcolm Turnbull handed down the ninth annual Closing the Gap report in February, Indigenous child mortality was among the targets 'not on track'. Indigenous children were still twice as likely to die before the age of five as non-Indigenous Australian children.

The target set by the Council of Australian Governments (COAG) in 1998 was to halve the gap in child mortality rates by 2018. Progress has been made – Indigenous child mortality has declined by a third since 1998 – but there has been no real improvement since 2008. Among those who support government calls for progress to be accelerated are medical professionals caring for critically ill children.

Associate Professor Luregn Schlapbach is part of the Paediatric Critical Care Research Group at Mater Research Institute – University of Queensland, and works as a paediatric intensivist at the Lady Cilento Children's Hospital. He is leading research on life-threatening childhood infections and inflammation in critically ill children.

Dr Schlapbach led a major study which showed Indigenous children are three times more likely to be admitted to intensive care units with life-threatening infections than non-Indigenous Australian children. The study also found that population-based mortality rates from severe infections were more than double for Indigenous children compared to their non-Indigenous counterparts.

Published in the Australian Medical Journal, the research analysed data for the 82,750 child admissions to ICUs in Australia over a 12-year period, including 4864 Indigenous children. "We focused on the most severe infections," Dr Schlapbach explains, "such as sepsis, pneumonia, and other invasive infections requiring life support in intensive care facilities."

Children of Aboriginal and Torres Strait Islander background were seven times more likely to suffer from life-threatening *Staphylococcus aureus* infections – the leading cause of sepsis or septic shock in children. Sepsis and other life-threatening infections have been the focus of campaigns to improve survival for children around the world.

"The study shows that despite progress made, there remains a major difference between rates of severe infections in Indigenous and non-Indigenous children," Dr Schlapbach says. "We believe this is the largest study reporting on life-threatening infections in Indigenous children, and it highlights an important area of health inequity in a high-income country that requires urgent attention."

Dr Schlapbach would like to see further research to define risk factors and to develop and assess appropriately targeted interventions. "Risk factors may include those associated with social disadvantage, including overcrowded housing, poor access to clean water and sanitation, and the challenges accessing health care from remote locations. It is known that delays in initiating appropriate treatments can allow these infections to progress from mild to severe."

The Australian Government remains hopeful of achieving its Closing the Gap target on Indigenous child mortality. It says better integration of services across health, child care, early childhood education and school will result in better access to the right services for Indigenous children.

# Advancing health outcomes

Whether you're lecturing in a historic UQ building, doing the rounds in a busy hospital ward or juggling international time zones for Skype meetings, everyone with a UQ affiliation is connected by the common goal of creating change.

To make real change for patients and focus on health outcomes, collaboration is essential. Some of the Faculty's leading scientists have come together to expand their research as part of the inaugural Health Outcomes Programs (HOPs).

Announced for the first time in 2017, HOPs represents a strategic approach to Faculty research, in collaboration with hospital and health partners. First to be funded under the initiative are two projects tackling the key health challenges of antimicrobial use and skin cancer.

Professors Jason Roberts and David Paterson lead the project addressing the poor outcomes from infection in critically ill patients through optimisation of rapid diagnostics and antimicrobial dosing.

"Our research team will use whole genome sequencing to rapidly determine which bacteria are causing infection so the most suitable drug and dose combination can be given," Professor Roberts explains. "Once the process is established, the research team will test it in the clinic and determine its benefits to individual patients and the health system."

With the HOPs initiative still in its early days the team is feeling positive about the opportunity to work collaboratively toward clinical outcomes.

"In our team we have six individuals who are specialists in their own fields, mostly working in parallel but through this scheme are combining their expertise for a single end result, which we believe could be transformational," Professor Roberts says. "We rely on one another's expertise, knowing that none of us could get to the final outcome on our own."

Microbiologists at the School of Chemistry and Molecular Biosciences will be leading the work that increases the timeliness of whole genome sequencing techniques. Simultaneously at the Centre for Clinical Research, researchers will be validating the results of the whole genome sequencing for determining the best antibiotic for specific bacteria causing infections whilst other team members are testing dosing software to optimise dosing regimens.

"Our collaborators at the School of Chemistry and Molecular Biosciences bring essential knowledge and skills to our program," Professor Roberts says.

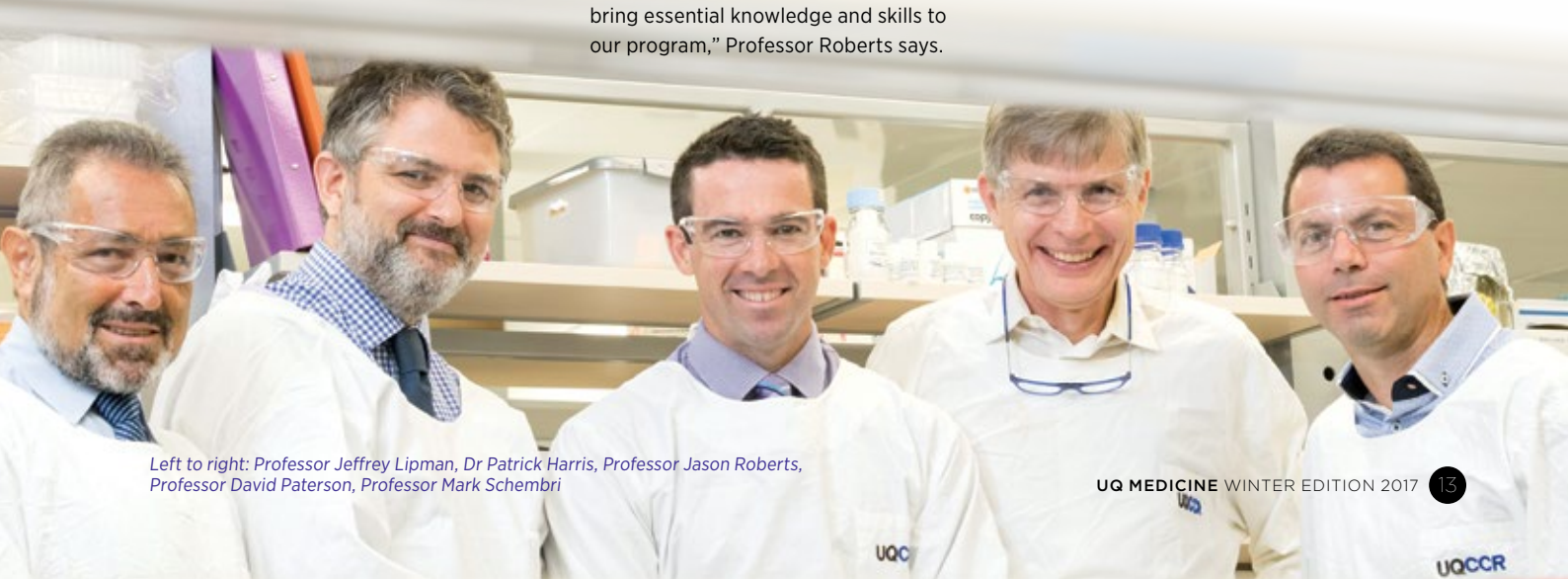
"HOPs is an opportunity to work with experts across the Faculty and other parts of UQ, who otherwise might be working independently."

The outcomes could be life-saving.

"We want to improve early diagnosis of infections in critically ill patients and hope that we will be able to determine the best drug and dose for a patient within 24 or 48 hours," Professor Roberts says. "At the moment it can take up to 72 hours, if at all."

HOPs supports very specific programs of research addressing an identified health problem and will produce a specific and visible benefit. The flagship Faculty program will provide operational support over five years to progress worthy world-class research.

A study examining high incidence and mortality for melanoma is the focus of the second HOPs project, led by Professor Peter Soyer of UQ's Diamantina Institute (see over) and Professor David Whiteman of the QIMR Berghofer Medical Research Institute.




*Left to right: Professor Jeffrey Lipman, Dr Patrick Harris, Professor Jason Roberts, Professor David Paterson, Professor Mark Schembri*

# No one should die of skin cancer

'No one should die of skin cancer' is the refrain driving Professor H. Peter Soyer's systematic research approach.

As UQ's Chair in Dermatology, and Director of the Dermatology Research Centre at UQ's Diamantina Institute, Professor Soyer leads a team of dedicated researchers who are pioneering ways to better detect, diagnose and predict skin cancers. Their work focuses on the three main types – melanoma, and squamous and basal cell carcinomas.

One of the group's advances in skin cancer research is a microbiopsy device which leaves only a pinprick-like wound behind – allowing minimally invasive sampling in search of new molecular biomarkers for skin cancer detection. This eliminates the unnecessary excision of lesions that might look suspicious, but ultimately turn out to be benign.

"For most people the earlier skin cancer is detected, the better the outcome," Professor Soyer explains. "But some people delay taking action because they fear having a chunk of skin removed for the diagnostic process."

The device takes just a quarter of a millimetre of skin – about 1500 cells – removing the need for the anaesthetic and sutures required in traditional biopsies. Professor Soyer sees microbiopsy-enabled elaboration of molecular profiling for early skin cancer diagnosis/prognosis and the identification of therapeutic targets as a future aspect of preventive dermato-oncology research.

When it comes to preventing and even predicting melanoma – which is the deadliest form of skin cancer – moles are considered by researchers to provide some of the strongest clues. Professor Soyer is also the leader in Centre of Research Excellence for the Study of Naevi, funded by the NHMRC.

Based at the Translational Research Institute within the Princess Alexandra Hospital precinct, the CRE is a collaborative research program between UQ, QIMR Berghofer Medical Research Institute, Cancer Council Queensland, the University of Sydney and the Queensland University of Technology.

The CRE is using innovative 3D imaging technology to revolutionise mapping and monitoring of high-risk patients.

The VECTRA Whole Body 360 imaging system uses 46 cameras to construct a 3D avatar of a subject with detailed reproduction of the skin. An extra camera captures and adds dermoscopic images of individual lesions to the avatar, showing additional features of the lesion.

"The total body photography system is able to track changes in skin lesions, which are a telltale sign of a developing skin cancer," Professor Soyer says. "This record of the person's entire skin surface allows comparisons at follow-up visits to identify changing moles."

Researchers are also studying how mobile teledermoscopy – detectors attached to smartphones – could be used for skin self-examinations, allowing individuals to keep track of their own lesions over time to improve early detection.

Advances in genomics are allowing researchers from the CRE to undertake the first study in the clinical setting to pre-emptively identify a patient's potential genetic susceptibility to skin cancers.

"We see that some people who have moles and don't go into the sun much still have a propensity for melanoma, due to their genetic background," Professor Soyer says. "Genomics, combined with known clinical risk factors, could help unlock and determine those at highest risk of developing melanoma. The ultimate goal is to personalise their screening program."

With a network of dedicated researchers and clinicians working tirelessly to produce breakthroughs like these for better detection, diagnosis and prediction of skin cancers, Professor Soyer's goal may be realised sooner rather than later.

*The Dermatology Research Centre receives generous philanthropic support from Epiderm, the Leo Foundation, the Merchant Charitable Foundation, the Queensland Institute for Dermatology, and Trevor and Judith St Baker.*

*Above left and opposite page: Professor H. Peter Soyer*
*Below: Dr Anthony Rafael, Associate Professor Rick Sturm, Professor H. Peter Soyer and Liz Payne*

# Educating doctors in a changing world

Medical care is changing. It is obvious to us all – from our experiences at the GP or our local hospital, to what we see on television.

Our discipline has always been dynamic, but new knowledge, technology and drugs are changing the practice of medicine at an ever-increasing rate. While this presents many benefits for us as consumers of healthcare, it poses considerable challenges for many others.

Paying for this increasingly sophisticated healthcare is an issue for government. Keeping up-to-date is a test for all medical practitioners. But spare a thought for those charged with teaching and assessing the next generation of doctors. What do they need to know now to help them manage the rapidly changing medical world they will enter? What skills and attributes will they need to respond nimbly to the challenges of the future?

As Professor Nick Hawkins explains, these are some of the issues being explored by UQ's newly-formed Office of Medical Education (OME). "Curriculum means not just what is taught, but *how* and *when* it is taught – and of course how it is assessed. Each aspect presents challenges and opportunities," says Professor Hawkins.

"Anyone who has practised medicine will tell you what all doctors must know, but there is rarely agreement on exactly what that is. Neither will there be sufficient attention to what our graduates will need to know when they begin unsupervised practice in earnest – five to ten years from now."

So, deciding on *what* to teach is always a challenge. With the growth of knowledge, figuring out what not to teach can be even harder. In a world where methods of knowledge delivery are constantly changing – along with student expectations – an equally important challenge is determining *how* to teach.

Professor Hawkins highlights the changing landscape of the lecture theatre. "The 50-minute lecture is still a staple for university teachers, but less so for students who now see knowledge transfer as something for the internet and cloud-based knowledge repositories. For them, classes are a place for active and engaging learning – through case-based tutorials with experienced facilitators, and real-world experiences in clinical settings with patients and clinicians."

As the founding Director of the OME, Professor Hawkins sees meeting these demands requires ongoing attention. "While medicine is blessed by having wonderful learning activities available at our clinical sites, changing patterns of patient care are also impacting on those great institutions of medical education.

"Assessment is always a challenge, particularly in terms of maintaining consistency across UQ Medicine's vast geographic footprint, while still ensuring critical input from local supervisors and teachers. Here, as with knowledge delivery, technology offers great hope for improved efficiency and reproducibility of assessment."

Professor Hawkins says the OME – a relatively small academic unit based at Herston, reporting directly to the Medical Dean – exists to meet those challenges. "The Office of Medical Education was established to describe a blueprint for learning that will allow our graduates to be effective practitioners in the future world of medicine, and to ensure through the creation of effective assessments that they will meet the expectations of our community.

"However, the OME is just one part of a complex network of academics, professional and technical staff, academic title holders and clinicians – all engaged in the enterprise of teaching our medical students. Our key role is to coordinate that network to maximise the effectiveness of everyone in it."

# Growing beating human heart tissue from stem cells

Cardiovascular disease is the leading cause of death worldwide. Given the heart's limited regenerative capacity, diseases that result in the death of cardiac muscle cells – such as heart attack – can produce devastating malfunction.

Enter UQ School of Biomedical Sciences researcher Dr James Hudson, whose research is focused on unravelling the molecular mechanisms that drive cardiac regeneration and development.

Dr Hudson received the 2017 Queensland Cardiovascular Researcher of the Year Award from the National Heart Foundation in May. His Muscle Tissue Engineering Laboratory uses state-of-the-art bioengineering techniques to produce functional human cardiac organoids – miniaturised and simplified versions of organs. The lab is using these organoids to discover the fundamentals of development, multicellular interactions and function.

Advances in stem cell sciences and tissue engineering have provided unparalleled opportunities to generate human heart tissues 'in a dish'. Dr Hudson's team utilised these technologies in a significant step for cardiac disease research – the creation of a functional, 'beating' human heart muscle in the laboratory. This research included collaboration with German researchers and Australian partners to create models of human heart tissue to study cardiac biology and diseases from stem cells.

The patented technology enables scientists to perform experiments on human heart tissue solely in the laboratory. They have viable, functioning human heart muscle to work on, to model disease, screen new drugs and investigate heart repair. The Hudson team has also extended the research and proven that immature tissues have the capacity to regenerate following injury.

"We used dry ice to kill part of the tissue while leaving the surrounding muscle healthy and viable," Dr Hudson explains. "We found those tissues fully recovered due to their immature nature, enabling the cells to regenerate – in contrast to what happens normally in the adult heart, where there is a 'dead' patch."

The goal now is to use this model to potentially find new therapeutic targets to enhance or induce cardiac regeneration in people with heart failure. "Studying regeneration of these damaged, immature cells will enable us to figure out the biochemical events behind this process," Dr Hudson says. "Our goal is to determine how to trigger this replication process in adult hearts for the treatment of cardiovascular diseases."

James Hudson graduated with a Bachelor of Engineering (Chemical & Biological) from UQ in 2006. Rather than pursuing a career in industry, he chose to undertake a PhD in tissue engineering in the laboratory of Professor Justin Cooper-White, to focus his research at the forefront of biotechnology advances. He was awarded an NHMRC Early Career Fellowship in 2013, and an NHMRC Career Development Fellowship topped up by a National Heart Foundation Future Leaders Fellowship in 2017.

Dr Hudson's laboratory hosts five researchers and is currently running four research projects. To date, it has produced 22 publications and registered four patents. The Hudson lab is one of eight core labs in UQ's Centre for Cardiac and Vascular Biology, which was launched in May. The CCVB recognises the need for a multidisciplinary approach to cardiovascular disease and includes members and affiliates across UQ and Brisbane's hospitals.

"Our goal is to determine how to trigger this replication process in adult hearts for the treatment of cardiovascular diseases."

# Australia's longest-running study of women's health

Twenty years on, the Australian Longitudinal Study on Women's Health (better known as Women's Health Australia) is the largest, longest running study on women's health in the country.

Since the study commenced in 1996, a joint team from The University of Queensland and the University of Newcastle has kept track of some 58,000 women, processed 250,000 surveys, sent 2.5 million emails and analysed 114 million responses to questions. The result is a national research resource like no other.

Women's Health Australia is funded by the Australian Government Department of Health to provide an evidence base for women's health policy and practice. The study has proven to be a goldmine for policymakers, being cited in a host of state and national policies and guidelines – most notably, the 2010 National Women's Health Policy and the 2014 Australian Physical Activity Guidelines.

As study director Professor Gita Mishra from the UQ School of Public Health explains, the study initially recruited three cohorts from around Australia in 1996. Participants were drawn from various age groups to examine how critical stages across the life course impact women's health.

The oldest cohort (born 1921-26) was chosen to reveal the factors involved in ageing well. The middle cohort (born 1946-51) helped investigate the transition through middle age and menopause. The youngest cohort (born 1973-78) shared stories of relationships, work, study and becoming mothers as they transitioned into adulthood. In 2013, a new cohort of young women joined the study – millennials born between 1989 and 1995. The many women participating continue to answer regular surveys on a broad range of factors addressing their physical and mental health, lifestyle and sociodemographic factors.

Professor Mishra says the study has built an international reputation as a research resource. "Data sharing and collaboration are fundamental to the role of the research resource.

We encourage researchers to use our data. Our collaborators are multidisciplinary and they offer fresh perspectives and new insights that help to strengthen the evidence base for women's health policy."

To date, more than 700 collaborators from around the world have accessed the study data, resulting in more than 600 peer reviewed papers. Researchers can also apply to run sub-studies, which collect additional data from participants. Such sub-studies are carefully considered to limit demands on participants. To date, almost 100 additional surveys have collected data on topics as diverse as sleeping difficulties, domestic violence, menopausal problems, urinary incontinence, leisure, diabetes and the plans of younger women. A new crop of sub-studies is opening exciting new avenues for researchers.

As the study enters its third decade, researchers have begun collecting data on participants' children for the first time. Launched last August, the Mothers and their Children's Health sub-study assesses factors such as children's diet, physical activity, screen time, yard size, sleep patterns, milestones and childcare.

Deputy director of the study, Associate Professor Leigh Tooth, says the new sub-study will offer a broad perspective. "One of the really unique things about this particular sub-study is the inclusion of multiple children from the same family. We can look at outcomes across families, and we can dig down and start to look at differences between siblings."

The children's data will be coupled with health and education records, as well as the Women's Health Australia study, providing 20 years of data on the mother's health, lifestyle and sociodemographic factors. Dr Tooth is eager to see research begin. "Linked together, the surveys will paint an incredibly rich picture. We'll have unparalleled insight into the complex relationships between a mother's health, before and after childbirth, and her children's health and development."

*Right: Associate Professor Leigh Tooth*
*Left: Professor Gita Mishra*

The Women's Health Australia study is also taking the initial steps to expand into collecting biological data. A pilot sub-study is investigating predictors of health glucose control for Australian women, and testing for nutritional status and metabolic markers of diabetes control.

Another pilot sub-study beginning in 2017 will investigate the links between female reproductive function (from menarche and menses through to pregnancy and subfertility) and the risks of cardiovascular disease, diabetes and respiratory conditions. A large sample of premenopausal women from the 1973–78 cohort will be asked to provide blood samples, undertake functional tests (including cardiovascular and lung function, hand grip strength, and cognition) and wear physical activity trackers.

Collecting biological data presents new logistical challenges, but Professor Mishra is enthusiastic about the future. "This is a really exciting step that will take the study to the next level," says the study director. "It bridges the gaps between the self-report of symptoms, while looking at the underlying biological processes.

"These new sub-studies ask a lot more of our participants, but so far the feedback is positive. Part of what keeps these women so committed to the study, year after year, is knowing that their data will add to our understanding of women's health, and make a real difference to policies and women's lives."

*The Australian Longitudinal Study on Women's Health has received generous philanthropic support from The Arterial Compliance Project Trust.*

# Revolutionising early SCI treatment

For people with spinal cord injuries (SCIs), saving even a small measure of function can make a world of difference.

Retaining triceps function can mean being able to go to bed at night and get up in the morning, without having to wait for assistance.

Preserving hand dexterity will allow for independent feeding and bathing, or being able to drive a modified vehicle.

In very severe high-level lesions, saving one spinal 'level' can be the difference between relying on a ventilator and breathing independently.

Improving quality of life for SCI patients is the catalyst that drives Dr Marc Ruitenberg's research.

Dr Ruitenberg is the head of the Neural Injury and Repair Laboratory at The University of Queensland's School of Biomedical Sciences.

Dr Ruitenberg is currently conducting a clinical trial with a new therapy that aims to minimise tissue damage and improve recovery and rehabilitation, by reducing inflammation after the initial accident.

Trauma-induced inflammation causes further damage to the spinal cord and thus negatively impacts on future function.

"Up until now, doctors had no real treatment options to deal with this problem," Dr Ruitenberg says.

"We are optimistic that our research might change that."

In the trial, patients are given an anti-inflammatory drug – intravenous immunoglobulin (IVIg) – within hours of their spinal trauma.

Dr Ruitenberg's team discovered in animal studies that IVIg therapy can reduce harmful inflammation and, most excitingly, improve the recovery from serious spinal cord injuries.

This pre-clinical work was supported by the Wings for Life Foundation and SpinalCure Australia, and helped pave the way for the clinical trial.

Recruitment officially commenced in January, and there are now three patients who have received this therapy at The Princess Alexandra (PA) Hospital, Queensland's primary centre for spinal injury care.

It is too early to say whether they have benefited from receiving this therapy, but all have tolerated the treatment rather well.

PA spinal surgeon Dr Kate Campbell is heading up the trial with Dr Ruitenberg.

"One of the great benefits of IVIg is that it is quite safe and already used in the hospital for other conditions," she says.

"As a result, we have been able to quickly progress this treatment from the lab to the clinic."

Queensland Health estimates that 90 people sustain spinal cord injuries in the state each year, and the research team hopes to recruit a further 17 patients over the next three years.

"There are some obvious challenges we face in a large state like Queensland, in particular the need to start treating patients within 12 hours of the original trauma," Dr Ruitenberg says.

"Time is clearly of the essence here – the sooner we can get people to the hospital, stabilise them and start the treatment, the better the outcomes are likely to be."

"What we hope to achieve over the next three years is to demonstrate that this treatment is safe, is making people recover better from these devastating injuries and improving their overall quality of life."

CSL Behring is providing the IVIg, and funding, for the clinical trial.

Vice President R&D Strategy and External Affairs Dr Andrea Douglas says spinal injuries are devastating, and few options are available to effectively treat the inflammation that occurs.

"We are very pleased that Dr Ruitenberg's team are getting closer to finding a solution."

# Better health outcomes through discovery & innovation

## Professor Elizabeth Eakin
Associate Dean (Research)

Appreciating the real-world issues faced by our clinical and community partners is a philosophy Professor Elizabeth Eakin is taking into her new role as Associate Dean (Research). That philosophy will underpin opportunities to harness the Faculty's tremendous diversity in research and education, so that it continues to have a tangible impact on health.

Professor Eakin's research intersects clinical and public health approaches to cancer prevention, requiring her to develop numerous partnerships across the cancer control community. She has led many randomised controlled trials in health service and community settings, with the evidence generated now informing health promotion and disease prevention initiatives across Australia.

This research lays a firm grounding for what Professor Eakin now hopes to achieve. "Listening and engaging will help us to define the problems our communities and health partners are grappling with," she says. "It will also help us to understand how our research can play a role in informing solutions to those problems."

Professor Eakin believes the Faculty's diversity is an enormous strength when it comes to tackling health problems faced by patients, clinicians and communities. World-leading expertise extends from biomedical/discovery science through to clinical and health services implementation, along with research that informs public health policy and practice.

**"We comprise five schools, five research centres and approximately 1000 continuing and fixed-term staff. We have a community of more than 4000 non-salaried academics and around 3200 students. That is a substantial force driving the multifaceted approaches needed to achieve outcomes that will really change lives."**

Professor Eakin says she is honoured and excited to join the Faculty Executive – continuing her leadership trajectory since joining UQ as a Principal Research Fellow in 2005. A clinical psychologist with a passion for public health, she has 15 years of continuous NHMRC Research Fellowship funding, and made the Thomson Reuters Highly Cited Researchers list for 2016.

Professor Eakin's remit, working closely with newly appointed Research Dean Sean Emery and the Faculty Executive, includes strategic direction of research and research training, improvements in their quality and impact, and the growth of local, national and international research collaborations.

"Collaboration will be the key to remaining competitive in a changing funding environment," Professor Eakin says. "We have to get even better about engaging with one another – across the Faculty, across UQ and with industry and community health partners. Facilitating connections and a shared vision across our hugely diverse Faculty will enable us to deliver better health outcomes through discovery and innovation."

# On a fast track to rural medicine

For 17 years, Mary Loch had been waking up to cackling kookaburras. She had perfected the art of shooing kangaroos from the back paddock. Her battle scars tell tales of weekends spent mountain biking through the bush surrounding her home in Rockhampton.

Today, the biomedical sciences student is halfway through her first year at UQ. Mary is one of 38 rural students who gained provisional entry into the Doctor of Medicine (MD) – so a good performance in her undergraduate degree will secure her a spot in the MD class of 2020.

While Mary has well and truly settled into life at St Lucia, the idea of joining UQ seemed unlikely to her in January when QTAC released their round of offers.

"I had already received an offer to study medicine at James Cook University," Mary recalls. "So when the QTAC offers came out, I thought that'll be it, and I didn't even look at it. But Mum said I should just check it."

When Mary eventually logged on to check her QTAC account, she saw an offer to study with UQ – her dream pathway to medicine.

"We were jumping around, hugging each other and screaming with joy! I honestly didn't think I was going to get in because it's just so hard. I rang Dad, who was in a meeting, so I said 'Hold the meeting – I got into medicine!' and he yelled 'What?!' Words can't describe how happy we all were. All the hard work had paid off. I actually printed out the offer letter and laminated it!"

While Mary had wanted to be a doctor for as long as she could remember, it was her interactions with staff from the Rural Clinical School (RCS) in Rockhampton that provided the inspiration and motivation to pursue her dreams.

"The staff genuinely wanted to help me. They went out of their way to give me the information I needed. I must have visited them a dozen times! Whether it was the nitty gritty admissions information, tips for the UMAT or inviting me to their events to experience life as a doctor, they were always there. I learnt so much from the RCS team, and it really took the pressure off while I was getting through year 12."

Head of the Rural Clinical School, Professor Sarah Strasser, says she is thrilled to hear that the RCS had such a profound role in shaping Mary's future.

"Our key purpose is to provide a high quality medical education in a rural setting – with a view to longer term recruitment and retention of a well-trained rural medical workforce," Professor Strasser explains. "But we also have a commitment to engage with our communities. The team are extremely invested in the work they do, and it is always satisfying to hear stories of rural students who are so passionate about rural medicine."

"Our key purpose is to provide a high quality medical education in a rural setting – with a view to longer term recruitment and retention of a well-trained rural medical workforce," Professor Strasser explains.

The long road to practising medicine still has six and a half years of twists and turns for Mary, but she is adamant that a rewarding career in rural medicine awaits her.

"The dream is to come back to Rockhampton or go further afield within rural medicine and help the people in the bush," Mary says. "I'm enjoying Brisbane, but that relaxed country lifestyle and community spirit back home is what really appeals to me."

Like many of the medical students and alumni at UQ, Mary is balancing her studies with life outside the classroom, and was quick to pick up plenty of new activities to fill her diary. "I've always found it much easier to do well in the classroom when I'm stress free, and I do that by keeping busy and getting outdoors.

"My bike made the trip down to Brissy with me, so I've done plenty of riding and I've joined a running club on campus. I've also joined the choir at college and have met plenty of really great people. Living on campus has made the whole experience seamless."

While St Lucia may not have as many kookaburras and its bike paths are a bit more sedate than Rocky's hills, Mary's journey is one that resonates with many rural students and alumni. We wish her all the best as she pursues her medical degree.●

# UQ Medicine launches two new Centres for Research Excellence

With Professor Vicki Flenady and Professor Roslyn Boyd establishing Centres for Research Excellence in their chosen fields, the Faculty of Medicine is now host to six CREs. And the newest centres on the block are already making a difference in both stillbirth and cerebral palsy research.

## PROFESSOR VICKI FLENADY
### CENTRE FOR RESEARCH EXCELLENCE IN STILLBIRTH

"More than 3000 families in Australia each year suffer the loss of stillbirth," explains Professor Flenady, "and there has been no improvement in those rates for more than 20 years. Up to 60 per cent of stillbirths remain unexplained, making it even harder for families to move on after they go through that experience."

Professor Flenady and her team aim to reduce the stillbirth rate after 28 weeks' gestation, and improve the quality of care after stillbirth for affected families. The Stillbirth CRE team includes nine partner institutions, along with several additional collaborators. Professor Flenady says they are already making progress.

"We've launched a large-scale randomised controlled trial of the My Baby's Movements (MBM) smartphone app and SMS program, which is about empowering pregnant women to be aware of the importance of keeping track of their baby's movements, which are an indicator of their baby's health. The app is being rolled out at 26 sites across the country. Every woman coming into care at one of our participating hospitals will be offered the MBM app free of charge."

The MBM app gives expectant mothers frequent reminders to be aware of fetal movements, and prompts them to contact their healthcare professional if they have any concerns. The collaborative research team will also implement best practice guidelines for antenatal care of women to better identify those at risk, improve screening, and increase the focus of after-care for affected families.

Professor Flenady says the outcomes of the CRE's research could extend beyond reducing the incidence and improving the response to stillbirth. "If we can measure the impact of our program tactics not just on families who experience stillbirths but other family groups, we may determine that others can benefit from similar supportive or preventative strategies during or after a pregnancy."

# PROFESSOR ROSLYN BOYD

## NHMRC CENTRE FOR RESEARCH EXCELLENCE: AUSTRALASIAN CEREBRAL PALSY CLINICAL TRIALS NETWORK

Improving health outcomes for children with cerebral palsy and acquired brain injury has long been the motivation for Professor Ros Boyd and her team at the Queensland Cerebral Palsy and Rehabilitation Research Centre. The new Australasian Cerebral Palsy Clinical Trials Network (Aus-CP-CTN) will elevate earlier detection of CP across Australasia, fast track children to multisite randomised clinical trials of new neuroprotectants and develop and test new interventions in clinical trials. Knowledge translation studies will ensure effective transfer to enhanced clinical practice.

The CRE will overcome known barriers to implementation by developing Clinical Care Pathways and International Clinical Practice Guidelines, guided by a consumer network. The changes in outcomes due to new clinical trials will be tested in the Australian CP Register.

The AusCP-CTN combines internationally recognised teams from The University of Queensland, CP Alliance/University of Sydney; Ritchie Centre/Monash University; Perth Children's Hospital/ Curtin University; Adelaide Children's Hospital; and Starship Children's Health/ The University of Auckland. These research teams are closely linked to state-wide Cerebral Palsy clinical teams, enabling capacity building across five states and New Zealand.

Between 600 and 700 infants are born with cerebral palsy each year, and it's a lifelong condition, with estimates that 34,000 Australians are living with CP. As Professor Boyd says, the health issue impacts thousands of families.

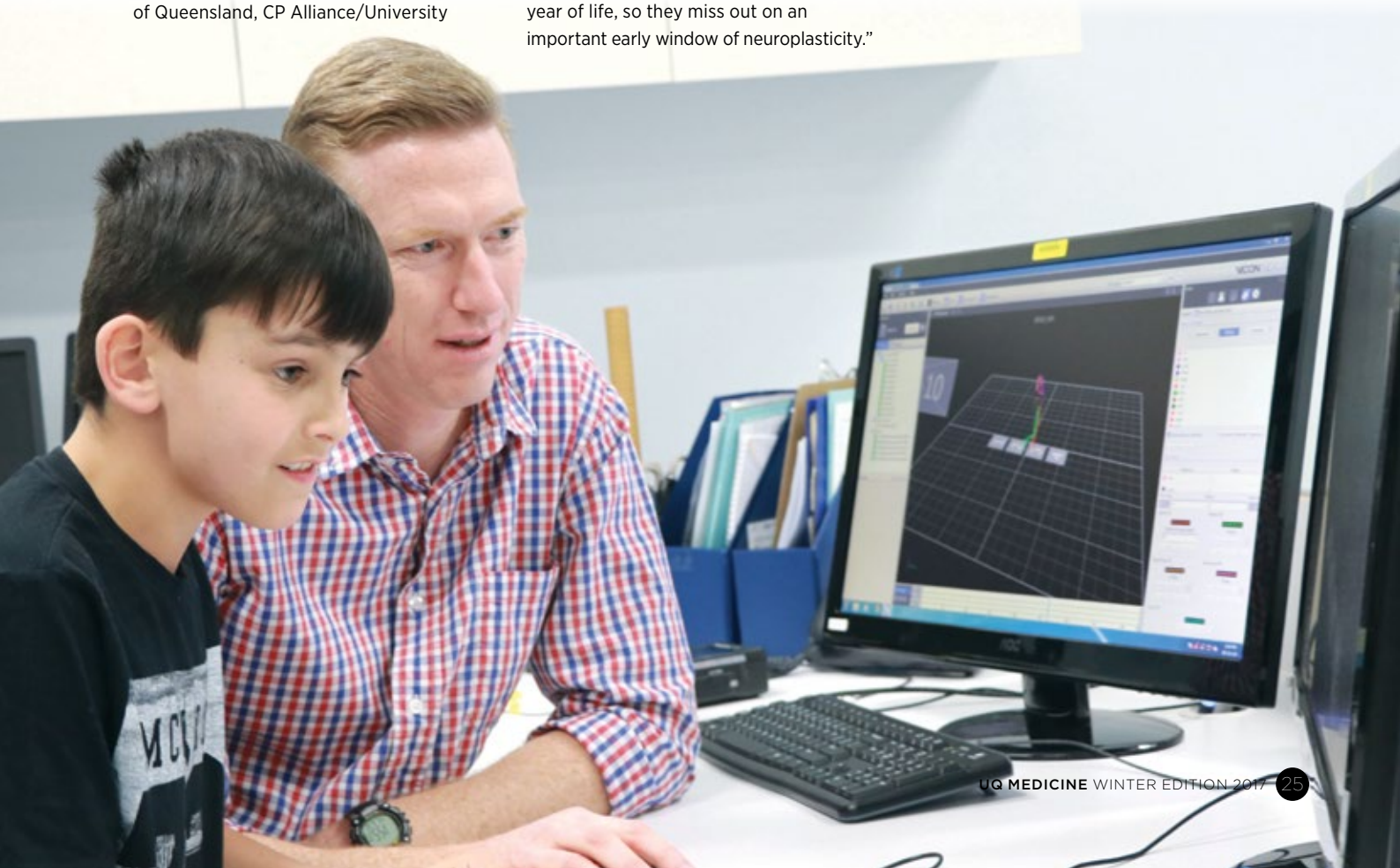
"We've recently been working to improve early detection of cerebral palsy in at-risk newborns so that we can fast-track them to early intervention. Starting therapy earlier means enhancing the quality of life for infants and their families.

Currently children with CP do not usually receive their diagnosis until the second year of life, so they miss out on an important early window of neuroplasticity."

"It's critical that we understand as much about the early biomarkers and impact interventions that may prevent neural damage, or improve development in these early days so we can improve the health and wellbeing of these children in the long-term. Using technologies such as advanced brain imaging, telemedicine and smartphone apps, we have new ways to tackle childhood health issues and to translate that new knowledge to clinicians nationally, giving hope to families across the country."

Professor Boyd and her multidisciplinary team of 38 researchers are leading the charge in cerebral palsy research. Now with a focus on earlier detection and evidence based effective early intervention, Queensland is set to become the hub for research in the field.

*Professor Boyd's Cerebral Palsy research is generously supported by Merchant Charitable Foundation via the Children's Hospital Foundation.*



# Fighting Ebola on the frontline

While the rest of the world watched from a safe distance, UQ masters graduate Dr Ronald Carshon-Marsh found himself tackling the Ebola crisis in West Africa, up close and personal.

Ronald commenced his studies at the College of Medicine and Allied Health Sciences in his home country of Sierra Leone. He graduated with an MBChB degree in 2008 and worked as a medical officer. In 2012, he received an Australian Awards Scholarship to study a masters degree in UQ's School of Public Health.

Upon completing his master's degree in 2013, Ronald returned home to Sierra Leone and was immediately appointed to the post of Lead and Medical Superintendent of the Koidu Government Hospital. Shortly after taking on the role, the Ebola outbreak was officially declared by the World Health Organization (WHO).

Despite already working flat out to keep the hospital running with a shortage of doctors and health staff, Ronald was given additional duties to assist with the outbreak. He rapidly became the head of Ebola case management.

"We worked tirelessly but we were unable to contain the outbreak," recalls Ronald, "so international help was paramount. Eventually we received support from various NGOs including WHO, Red Cross, World Vision and many others."

Community ownership of the response to the outbreak was critical, and Ronald credits his UQ study with preparing him to take control and assist with the community mobilisation, engagement and surveillance required. "Through the combined effort and resources coordinated by the District Ebola Response Centre and District Health Management Team, the response became more effective with active community participation," he says.

Late in 2015, 18 months after the outbreak was detected, Sierra Leone was officially declared Ebola-free. The country now has safeguards in place to guide the response to future disease outbreaks, and ultimately to save lives.

Based on the significance of this work, Ronald was awarded a UQ Faculty of Medicine 2016 Excellence Award. Ronald was awarded the Young Alumni Excellence Award for dedication to improving the lives of others in his work, under the most challenging circumstances both within Sierra Leone and internationally.

In December 2016, Ronald was promoted by the Chief Medical Officer to become District Medical Officer in charge of the Moyamba District Health Management Team. Ronald then accepted the opportunity to participate in a global training course for future health leaders in Japan.

This intensive month long course focused on capacity development in health systems planning at Tokai University, supported by the JICA Yokohama International Centre.

Ronald has since represented Sierra Leone at a critical WHO technical workshop. This workshop focused on collating perspectives from those with experience in Ebola-affected West African countries, and the linkages between early recovery, resilience and quality universal health care.

The Ebola epidemic exposed a myriad of challenges facing Sierra Leone's health system – from disease surveillance to infection prevention and control. Ronald continues to work towards creating change at a local level, while contributing to the development of health policies on a global scale.

# On track for a storybook career

Dr Kate Thomas is an Internal Medicine Resident at the Ochsner Medical Center in New Orleans. In 2016, Kate graduated from the UQ medicine program's Clinician Scientist Track, combining her medical degree with a research higher degree.

**While completing her MBBS and MPhil through the UQ-Ochsner Clinical School, Kate was intrigued by the concept of using children's storybooks to tackle tricky health messages. Her first book – on second-hand smoke exposure – has gained international interest. Her second book – on healthy weight management – is about to be printed.**

**We asked Kate to share her story ...**

The focus of my MPhil was on increasing paediatricians' screening, counselling and referral rates through health promotion. My Principal Supervisor, Dr Fernando Urrego, proposed the book idea when I was on rotation with his paediatric pulmonology clinic at Ochsner.

We hoped the book would prompt conversations between physicians and caregivers about the dangers of second-hand smoke exposure – a potentially touchy subject to broach. Some people take offence when such issues are raised, or they deny smoking for fear of being judged.

When you consider that caregivers typically see their child's paediatrician more than their own GP, paediatricians are well-placed to discuss smoking cessation, and advocate for the health of their patients.

The read-along book follows the story of a local New Orleans boy and his grandfather, emphasising the importance of smoking cessation. The book is being distributed through New Orleans paediatric clinics, and 15,000 copies have been printed.

We wanted the book to stimulate discussion between physicians and families. Also, the child can take the book home, so it serves as a constant, subtle reminder that help is available if the caregiver chooses to quit. What is particularly special is that this may be the first storybook many children will own!

Our second book tackles another important public health issue – promoting healthy weight management in the paediatric patient population. It is estimated that almost 60 per cent of paediatric patients in the US are either overweight or obese.

This story follows a New Orleans girl and her family on a quest to get healthy, as they identify unhealthy behaviours and make changes. In addition, it provides ideas on activities to participate in within the community. Like our smoking cessation book, it addresses a serious problem, while focusing on our unique culture here in New Orleans.

I grew up in Canada in London, Ontario, and completed my undergraduate degree at the University of Waterloo, then a Master of Science at Western University, in a molecular biology laboratory. I have a passion for research, but I wanted to engage with people more than I could in a lab setting. Medicine was really intriguing – it seemed the best way to combine what I loved about research and my need to interact with people.

I found the Clinician Scientist Track when I was researching UQ's medical program, and the opportunity really called to me. I wanted to make sure that research was an integral part of my future practice.

The UQ Clinician Scientist Track and the completion of my MPhil have really supported that goal.

Working with patients to create health behaviour change on a population level is very exciting and rewarding. This degree has already opened so many doors for my career. I have been able to go on multiple national and international trips to present our research.

My MPhil research has resulted in invitations to speak internationally, including at the 54th Annual Conference of the Indian Academy of Pediatrics earlier this year. It was a fabulous experience and many physicians there took a sample of the smoking cessation book.

We have been approached by the Academy to produce a similar storybook geared to the Indian culture. Like America, India has very high second-hand smoke exposure rates. It is exciting to be able to make an impact in two cultures.

My research projects have created stepping stones for work that our research team is currently investigating. This experience has also provided me with fabulous mentors. Dr Urrego at the Ochsner Medical Centre, and Professor Steve Kisley and Associate Professor Di Eley from the Faculty of Medicine have been a tremendous support.

I would highly recommend the UQ Clinician Scientist Track to medical students who want to combine a research higher degree with their medical program. It is a lot of work, but extremely rewarding.

# New centre to improve healthcare delivery

Given Australia's ageing population and the growing incidence of chronic illness and frailty, investment in research to improve health outcomes for patients is imperative. UQ's Centre for Health Services Research (CHSR) was established to meet the challenge.

The CHSR combines the capabilities and interests of three foundational centres – the Australasian Kidney Trials Network, the Centre for Online Health and the Centre for Research in Geriatric Medicine. By providing a powerful platform for health service research, and pairing consumer insight with outstanding clinical research, the CHSR strives to improve the effectiveness of health service delivery.

Led by Professor Len Gray, the CHSR's activities sit at the interface between mature research and the clinical care setting, further focusing the existing health services research being conducted at UQ.

"It is vitally important to so many patient groups that we deliver health services efficiently," says Professor Gray. "With our ageing population, budget pressures and continually evolving technologies, this is an ongoing challenge. Our new Centre for Health Services Research builds on the collaborative work already happening within UQ and with our external partners. It will also ensure the latest technologies are used to optimise the delivery of services to patients."

Professor Gray is well-credentialled to lead the CHSR. He has worked in the management of public hospital and specialist aged care services for more than 15 years. His previous UQ positions include the Masonic Chair in Geriatric Medicine, Director of the Centre for Research in Geriatric Medicine, and Director of the Centre for Online Health.

Professor Gray says his particular interest is in improving the systems of patient assessment and care delivery. "This has led to research involving the development and evaluation of new systems of care – in community settings, hospitals and residential aged care. I look forward to supporting the centre's staff and collaborators to develop programs and priorities which will ultimately improve the efficiency and effectiveness of health service delivery."

Enabling the refinement and expansion of current programs, the CHSR will also incorporate research streams relevant to many vulnerable groups across the Australian community. By focusing on individuals who are disadvantaged due to health problems, healthcare access and health outcomes, CHSR researchers hope to develop solutions that are acceptable and sensitive to patients within Australia and around the world.

# Raising awareness of rare diseases

Ely Pleitez suffers from the rare degenerative disorder ataxia-telangiectasia – more commonly known as A-T. So rare is the condition, there are only some 50 diagnosed cases in Australia. As such, treatment and support options for patients are severely limited. While Ely isn't looking for a cure, she is hopeful that medical researchers can develop treatments to make life easier for her and her family.

Professor Martin Lavin leads a team at the UQ Centre for Clinical Research working to unravel the mysteries of A-T. As Professor Lavin explains, A-T is a multi-system disorder, affecting a variety of body systems. "A-T affects the brain, lungs, liver and immune system. While our research has focused on a number of these organs, we're now concentrating on the lungs – because lung disease kills up to 40 per cent of A-T patients."

Dr Abrey Yeo, a researcher in Professor Lavin's team, is conducting research to profile the microbial species (microbiome) present in the airways of patients with A-T. "If we are able to identify the microbiome, or a trend in the microbial profile of these patients," says Dr Yeo, "then we can develop more targeted therapies using more effective antibiotics."

While Professor Lavin and his team conduct their research into A-T, Ely creates paintings to build awareness and raise valuable funds. Ely's mother Sandra says her paintings have raised thousands of dollars for research and support initiatives. "Through painting, Ely is able to express what she likes," Sandra says. "She feels good that the money she raises helps researchers, as well as organisations such as BrAshAT and Montrose, which support us."

As Ely explains, due to A-T's far-reaching effects, people like her require full-time care. "I need 24-hour support," Ely says, "and I get that from my Mum. She can't work. She can't do lots of stuff with my sisters because she has to look after me."

Sandra says Ely's goal is to continue to raise awareness of A-T, and promote support organisations such as BrAshAT. "A lack of awareness means that support in the public system is very limited for A-T patients," Sandra says. "Even small things are difficult to organise because most people don't know what A-T is. Everything takes a long time, and this is worrying when Ely is sick.

> "Raising awareness for research and support costs a lot of money. We want people to look at the organisations that help A-T patients and see what they can do to help."

# A Queensland medical dynasty

Charles Roe AM is the last surviving member of the first intake of Queensland University Medical School students, who graduated in 1940-1942.

At 98, he lives in a house at the remote southern tip of South Stradbroke Island, where the advent of solar power has meant he no longer relies on kerosene lamps.

It adjoins land bought in 1882 by his grandfather, Reginald Heber Roe. As a young classics and mathematics graduate, Reggie arrived in Brisbane Town from Oxford in 1876 to become the second headmaster of Brisbane Grammar School. An educationalist with a passionate belief in education for everyone, Reggie went on to become the first Vice-Chancellor of The University of Queensland.

From the earliest days, the lives of the Roe family would become closely interwoven with the Brisbane medical community. That formidable champion of women's health, Dr Lilian Cooper, performed a hysterectomy on Reggie's wife, Maud, on the kitchen table of the Roe family home at Indooroopilly. Dr Jefferis Turner – first resident surgeon at the Hospital for Sick Children, and famous for linking childhood lead poisoning to weathered paint – stepped in to attend a young member of Charles's mother's family, who was in the final stages of typhoid fever. The quietly spoken Turner (nicknamed 'Gentle Annie') earned the family's gratitude as another doctor had refused to make the journey.

"They were different times," says Charles. "Generally speaking, despite infections, health was better. The food was better – it was simpler – and they had more exercise. They were also far more resilient."

## 'THE REASON I WENT INTO MEDICINE'

That resilience was borne out later when Maud suffered abdominal pains while on South Stradbroke Island. With her were Toby and Madge, the youngest of her six children. It was fortunate that her third child, Stanley – Charles's father – had chosen a career in medicine and was now a surgeon. Says Charles: "Madge went over to the mainland and rang my father and he went down in the train. Madge took him over to the island and he examined Granny. He diagnosed an obstructed bowel, bundled her up, and got her to St Helen's Hospital in Brisbane where he operated. The bowel had been twisted around an adhesion from the hysterectomy."

Dr Arthur Stanley Roe was Queensland's first Rhodes Scholar, and in 1904 he followed his father to Oxford. He returned home in 1913 and assisted a general surgeon for 12 months before setting up as a specialist urologist – Brisbane's first. In 1917, Stanley introduced a new German invention – the cystoscope – to the Mater Public Hospital, where he established the first urology department in an Australian public hospital.

Charles says he admired his father greatly. "He was an excellent surgeon. He made a great deal of difference to many people's lives. He is the reason I went into medicine."

It was at UQ Medical School that Charles got to know fellow student, Esther Gilmore Wilson, who would become his wife. Esther was one of only three women who graduated from UQ Medical School in those first years. She and Charles married in 1943 and she ran a general practice at Yeronga while raising four children.

## THE PACIFIC WAR

In 1941, World War II had entered the Pacific and the huge expansion of the military effort in the region meant there was pressure to train more doctors. "As a medical school student, life was very pleasant but the war was on everyone's mind," recalls Charles.

"Almost as soon as we had our results, we were allocated our hospital places. There were two of us sent to work at the Brisbane General Hospital's casualty department. We were told to be there at 8 o'clock on the following Monday morning. I had two days to get registered as a doctor. Sister Taylor ran the department. Basically, she said: 'Good morning – there's the examination room out at the back. Patients will enter here and when you need the next patient you ring this bell.' She hit the bell and we saw 70 patients that day. The hospital ran with a superintendent, four registrars and about 16 resident junior doctors. We often found ourselves working 90 hours a week – one week I worked 120."

Charles served for about a year as a resident in the Brisbane hospital before joining the Royal Australian Air Force. He was sent to Port Moresby. "I'd only been there about six weeks when I was posted to an operational fighter squadron," he says. "At 24, I was their medical officer."

After the war, back in Brisbane with a growing family, Charles joined the urological team at the Mater Public Hospital. "I also worked with my father, who was still in private practice," says Charles. "I learnt 'the trade'. It was all hands-on training – all open surgery. I probably assisted at 30 to 40 prostatectomies before I did a full one myself. Eventually, I found myself senior urologist at the Mater."

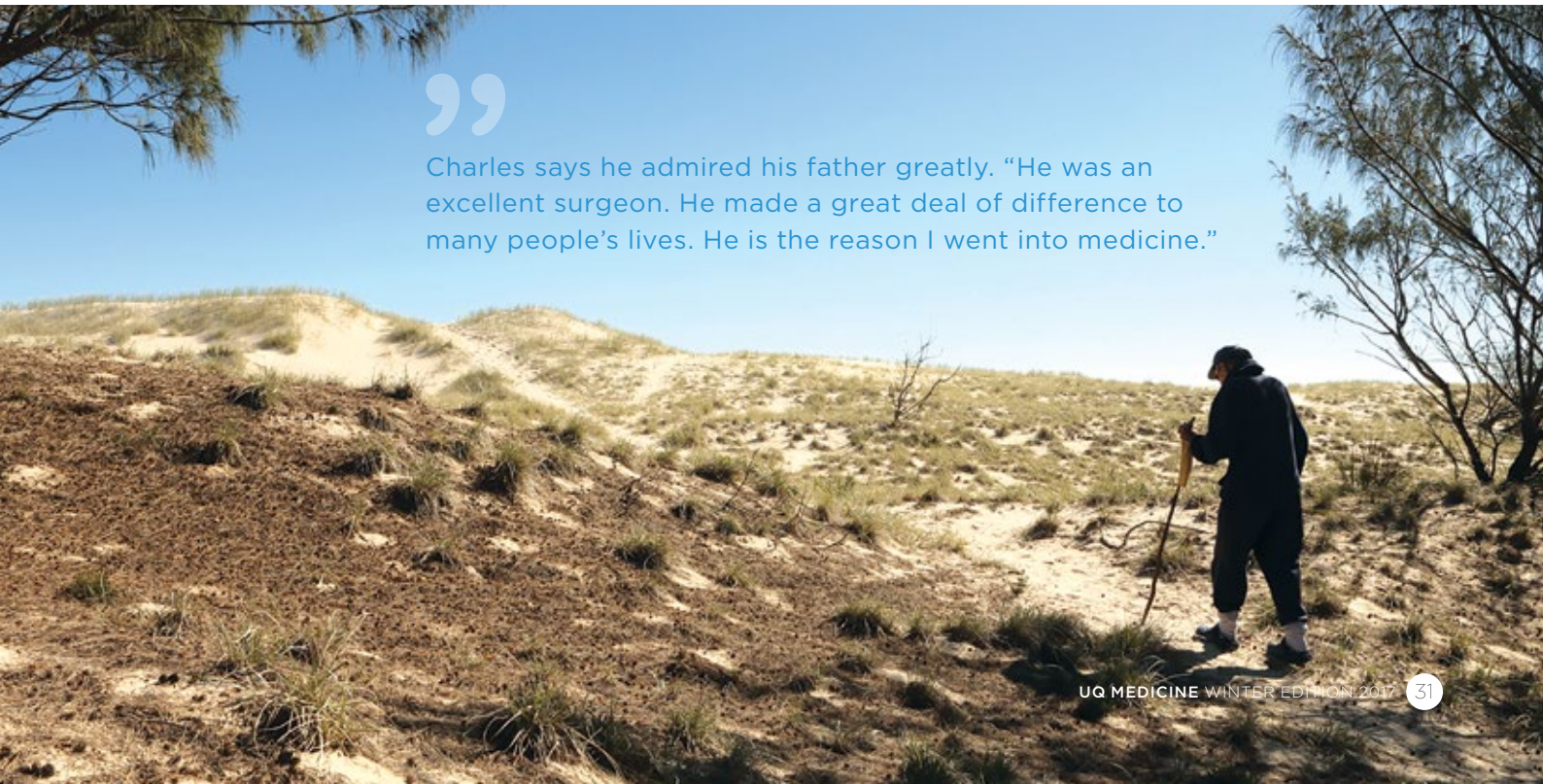
Charles retired from the Mater in 1972, but continued in private practice. In 1977, the Royal Australasian College of Surgeons awarded him a Fellowship in recognition of his distinguished career as a urologist.

## THE NEXT GENERATION

In some respects, the meeting of Charles Roe and Esther Gilmore Wilson at UQ Medical School was a case of history coming full circle. Esther's father, Benjamin Gilmore Wilson, known as Gilmore, had been a Brisbane Grammar student in Reggie's time, and was encouraged to pursue medicine by his headmaster. Reggie explained that his son, Stanley, was enjoying medicine at Oxford. Young Gilmore took the advice and went to Sydney University.

Dr Gilmore Wilson became a respected general practitioner in Ipswich. With practitioners across five generations, the Wilsons became one of Queensland's most prominent medical families.

It's no surprise that three of Charles and Esther's four children – as living combination of the Roe and Wilson genes – followed their parents into medicine. Dorothy, Barbara and Frances all became GPs. Frances's daughter Esther has also followed in the family footsteps and is working as a doctor.



> Charles says he admired his father greatly. "He was an excellent surgeon. He made a great deal of difference to many people's lives. He is the reason I went into medicine."

# Scholarship marks golden anniversary

Robert Menzies retired after a record 16 years as Prime Minister. Bob Dylan played the Brisbane Festival Hall on his World Tour. Decimal currency was introduced, and the average weekly wage was just $57. The School of Medicine Class of 1966 graduation year was a time of considerable social and political change.

Australia has come a long way in 50 years – as has the Class of 66. When they reconvened for their golden anniversary reunion, members were keen to do more than just reminisce about the past. In fact, the group hatched a plan to raise funds for a one-off scholarship – the 1966 Golden Reunion Scholarship.

Dr Don Perry-Keene and the reunion organising committee led the fundraising efforts. Members of the Class of 66 were quick to open their wallets to support the idea.

"We decided to award the scholarship to an academically gifted first year medical student in need of financial support – because your financial position should not dictate how you perform in medical school. We can all remember how demanding a medical degree can be, and fortunately we are now in a position to give back."

Some $20,000 was raised. The 1966 Golden Reunion Scholarship was presented at the 2017 prize and scholarships evening – to an 'over the moon' Michelle Kim.

"I was overwhelmed with gratitude for the donors when I found out I had been selected for the scholarship," says Michelle. "It is truly an incredible opportunity, and will really allow me to focus solely on medical school. I currently provide financial support for my Mum and brother, so the financial strain is always there. It can be difficult managing work with my huge study load. Receiving this scholarship will truly transform the future of my degree."

Michelle became interested in medicine when her mother was diagnosed with breast cancer when she was just 14 years old.

"I had never thought about medicine as a career before then. I had an interest in law, as we had family friends who were lawyers, and I liked the hands-on work that they did. But when Mum was diagnosed with breast cancer, I saw first-hand the amazing work health professionals do, and the impact they make. I was so inspired by the medical profession. My mindset shifted to medicine and I changed my school subjects to science. I've been focused on pursuing medicine ever since."

After finishing year 12 in 2012, Michelle was offered a place in UQ's Provisional Entry to Medicine. But after completing her first degree, she had to make the tough decision to defer her studies. "After completing my Biomedical Science degree, I had to defer my studies for a year and focus on helping my family improve our financial position."

Michelle plans on saving the scholarship money until phase two of her degree.


She is still working casually, but once she enters her clinical years, she plans to devote herself to her clinical rotations. "The scholarship means I can completely immerse myself into the clinical work of phase two, without compromising my learning by having to split time between university and work."

Michelle hopes to do a rural placement in the future, and ultimately aims to emulate the work of the surgeons who helped her mother. "It was the doctors who helped Mum who inspired me to study medicine, and ultimately my goal is to get into surgery."

Michelle was humbled by the generosity of the Class of 66 and says she too would like to give back one day. "This scholarship speaks volumes about the kind of support systems we have at UQ. I would like to be able to help other students with a similar scholarship in the future."

*To learn more about supporting scholarships, contact us at* ***med.advancement@uq.edu.au***

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