LIFELAB
The latest medical research news from QIMR Berghofer
Summer 2019 | Issue 101

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QIMR Berghofer
Medical Research Institute
THE FUTURE OF HEALTH
Here’s wishing you all a warm welcome to 2019. I have come back from the short Christmas break full of enthusiasm for the year ahead and the improvements we will contribute to health and wellbeing. As you can see from this edition of LIFELAB, we have an outstanding diversity of ground-breaking research projects currently in progress. Our lead article provides an overview of the breadth of research in progress in our Gut Health Laboratory, appropriate for this time of year. Our research team is contributing to many projects, including triaging the high volume of colonoscopy referrals, developing a Crohn’s disease assessment tool, and launching the Gut-Brain Connection study. Read more on page 4.

On page 8, we investigate an exciting new research project on bipolar disorder, led by Professor Sarah Medland who is the Acting Head of our Mental Health Program. The study aims to reveal the specific and heritable genes associated with this illness and determine why only some people respond to medications. We are currently recruiting for participants, with the full details provided in the article.
We are also partway through the Ovarian Cancer Prognosis and Lifestyle Study, known as OPAL, looking at the effects of diet and lifestyle on survival of women with ovarian cancer. While we know that a good diet is important for a healthy life in general, there is currently no evidence as to whether these factors might be able to stop a cancer from returning. Read more on page 10.

I would like to thank you for your most generous contribution in support of the recent Christmas appeal. I am sure you will agree, few are more Dedicated to Humanity than the passionate researchers working to improve medicines and health outcomes for people like you who support them. Much of the research conducted at QIMR Berghofer simply would not be possible without your generosity.

Professor Frank Gannon
Director and CEO

Cover image:
Maintaining good gut health is very much a holistic approach
Artist: Madeleine Flynn
Triaging colonoscopy referrals

Did you know, in Australia, bowel cancer kills one person every two hours? Is it any wonder then, that Australia has one of the highest rates of colonoscopy in the world. Over 900,000 colonoscopies are carried out in Australia annually, and this number is on the rise.

Each month Metro North Hospitals, which includes Caboolture Hospital, RBWH, The Prince Charles Hospital and Redcliffe Hospital, receive up to 2000 gastroenterology referrals from doctors referring their patients for the investigation of gut-related symptoms. Many of these patients will have a colonoscopy as part of their management. Dr Graham Radford-Smith is one of several specialists who process these referrals and performs colonoscopy procedures at the RBWH.

‘A significant percentage of referrals are for people who have presented with abdominal symptoms, however these symptoms are a poor guide as to whether a person is harbouring disease in the bowel, or not,’ he said.

To prioritise the waitlist of patients, Dr Radford-Smith has worked with Dr Anton Lord, lead analyst in the Gut Health group, and Dr Lisa Simms, senior laboratory scientist in the group, to develop and then trial a triaging method that grades a patient’s need for having a colonoscopy. It takes three factors into consideration: the patient’s symptoms, blood test results and faecal immunochemical test (FIT) results.

‘The FIT test is completed using a special-purpose kit — available from your doctor — and tests for hidden blood in the stool, which can be an early indication of bowel cancer, bowel polyps and inflammatory diseases,’ he said.

It’s recommended people over the age of 50 complete a FIT test through the National Bowel Cancer Screening Program.

‘This comprehensive triaging methodology can provide clinicians with an extra level of information that will help to more accurately determine whether a patient’s need for colonoscopy is urgent (within four weeks), semi-urgent (within three months), non-urgent (within 12 months), or not required.

‘I’m hopeful the prediction method will become so accurate that we can use it to identify patients who do not need a colonoscopy and then triage them to an alternative and more appropriate care pathway,’ he said.

Online predictor for Crohn’s disease

Inflammatory Bowel Disease (IBD) is an umbrella term used for a group of disorders where the intestines become inflamed — two major types are Crohn’s disease and ulcerative colitis. It affects 1 in 250 Australians, and its prevalence is on the rise.

Dr Radford-Smith and his team have recently completed extensive analysis using patient data in a fresh, new approach: to develop an online Crohn’s risk assessment tool.
The Crohn’s disease assessment tool lets people enter their symptoms and results from routine blood tests to assess their risk of developing Crohn’s disease of the small intestine, a segment also referred to as the ileum. This type of Crohn’s is most common in countries such as Australia and has the highest risk of complications such as bowel obstruction, and will often require abdominal surgery.

“We are planning to launch to the public during 2019, so people can enter their relevant blood results to see where they sit on the scale, thus empowering people to look at their own likelihood of developing Crohn’s disease.

“We can predict who is going to get Crohn’s disease on average 12 months before they’re diagnosed, based on an analysis of existing blood test results requested by their general practitioner (GP),” he said.

However, he advises that this approach will require further testing in a primary healthcare setting in collaboration with GPs and pathology services.

Gut-brain connection study

The Gut Health Laboratory is also searching for insights into the gut-brain connection, and the effect diet and exercise have on the brain.

“We know there is a very strong gut-brain connection. My team is currently collaborating with the Clinical Brain Networks Group at QIMR Berghofer on a project looking at the relationship between the gut microbiome and the brain, called the Gut-Brain Connection study.

“The study will investigate people’s levels of anxiety, their gut microbiome, and the results of a functional magnetic resonance (MR) scan, to determine whether specific components of microorganisms in their gut are associated with these behavioural traits, and hence whether dietary interventions may be beneficial to improving their mental health.

“We will investigate any differences that exist between individuals who have IBD, and healthy adults without IBD,” he said.

This study is currently recruiting for participants both with and without IBD. To register your interest email gutbrain@qimrberghofer.edu.au.

Holistic approach to gut health

Dr Radford-Smith encourages his group to focus on a more holistic way of promoting gut health, rather than solely managing and treating the disorders, such as IBD.

“As far as the future is concerned, it’s about prevention and providing Australians with more education, so they can reduce their risk of developing major gut disorders.

‘Maintaining good gut health is very much a holistic approach, which embraces eating a healthy, anti-inflammatory diet and exercising the body and mind. Together, these healthy choices work together to promote good gut and mental health,’ he said.

The same rules apply for people already living with a gut disorder.

‘If you combine healthy choices with medication, you’re likely to see a better quality of life and a reduction in your medication burden. When you consider most people are being diagnosed with IBD in their late twenties and early thirties, that’s a very powerful motivator,’ he said.

Dr Graham Radford-Smith
Head of the Gut Health Laboratory at QIMR Berghofer
MS is a condition of the central nervous system, which is estimated to affect 1 in every 1000 Australians. It can cause a range of symptoms, including problems with coordination, balance, weakness, arm and leg function, cognitive problems and memory loss.

While there are a range of treatments available to prevent attacks in relapsing-remitting MS (characterised by partial or total recovery after attacks), there are currently only very limited treatment options for people with progressive forms of MS.

In this world-first clinical trial of cellular immunotherapy for MS, the results revealed the treatment improved symptoms and quality of life for the majority of patients suffering progressive forms of MS.

The successful clinical trial is a collaborative effort of three of Brisbane’s world-class science and technology institutions. The new cellular immunotherapy was developed by Professor Rajiv Khanna AO and his team, and the phase I clinical trial was conducted by Professor Michael Pender and his colleagues from The University of Queensland and the Royal Brisbane and Women’s Hospital (RBWH).

**How does it work?**

The treatment is based on a theory of Professor Michael Pender’s: that MS is caused by an accumulation of Epstein-Barr virus (EBV)-infected cells in the brain, whereby a therapy targeting EBV can potentially stop the progression of MS.

The immunotherapy treatment was custom-made specifically to target the EBV. The cellular immunotherapy works by taking blood from patients, extracting their T (immune) cells, and ‘training’ them in the laboratory to recognise and destroy the EBV present in the brain lesions of MS patients.

Professor Pender said a total of 10 patients received four doses of the cellular immunotherapy treatment at the RBWH – five patients with secondary progressive MS and five patients with primary progressive MS.

‘Seven of these patients showed improvements. Without this treatment, we would have expected the symptoms of all patients to continue to get worse.

‘Improvements ranged from reduced fatigue and improved productivity and quality of life, to improvements in vision and mobility. Importantly, we found the treatment was safe and without serious side effects.'
‘Our findings add to the mounting evidence that EBV infection plays a role in the development of MS,’ Professor Pender said.

Louise shares her story

Mrs Louise Remmerswaal was one of the 10 clinical trial participants, a patient of Professor Pender’s, who was first diagnosed with MS 18 years ago.

“When I heard that Professor Pender was holding a trial, I was very excited that there might be an opportunity to participate, providing a chance to improve my health. With no treatment or cure for progressive MS, my future did not look bright,’ Mrs Remmerswaal said.

‘My blood was first taken at the RBWH Day Surgery Ward and delivered to the lab at QIMR Berghofer, to Professor Rajiv Khanna AO, where my T cells were treated for EBV.

‘Returning back to the hospital day ward on four separate occasions, my treated T cells were injected back into my veins, higher amounts of T cells each time, and I was monitored overnight in hospital on each occasion.

‘I had no adverse reactions.’

Mrs Remmerswaal says the immunotherapy significantly improved several debilitating symptoms she was experiencing, including vertigo, fatigue and incontinence.

‘My vertigo has completely disappeared, improving my quality of life. Now, I am able to share a conversation with someone who is standing and not feel sick, as I have to look up at them from my wheelchair.

‘And before the therapy, fatigue prevented me from socialising after dark. I am now able to enjoy going out to dinner, movies and parties with family and friends, and I’m better able to manage my fatigue during the day,’ she said.

Mrs Remmerswaal mentions that she found it very exciting to be one of the first to try a relatively non-invasive treatment to stop MS.

‘The immunotherapy treatment has improved my quality of life and given me hope to look into my future.

‘I feel very honoured to be part of this world-first trial. It’s proven that there is hope — not just for me and others who suffer with progressive MS, but for those who suffer with other autoimmune diseases,’ she said.

World-first immunotherapy treatment

Professor Khanna, Senior Scientist and founding coordinator of QIMR Berghofer’s Centre for Immunotherapy and Vaccine Development, said this was the first time in the world a T cell immunotherapy had been used to treat any autoimmune disease.

‘We have already used these cellular immunotherapies to treat different types of cancer and viral infections. This clinical trial is a breakthrough. For the first time, we have found these treatments are safe and have had positive improvements for people suffering with an autoimmune disease,’ Professor Khanna said.

‘This trial opens the door to develop similar cellular immunotherapies for certain other autoimmune conditions.

‘From this phase I trial, we have also discovered what cell properties produce the best results for the patients. We can now apply this knowledge to cellular immunotherapies for other diseases to try to ensure the best results for all patients,’ he said.
Approximately 1 in 50 Australians, or about two per cent of people, will experience bipolar disorder during their lifetime. Bipolar is a universal disorder affecting all genders, nationalities and socioeconomic groups equally.

People with bipolar disorder — previously called manic depression — can have depressive, and manic or hypomanic episodes that can last a week or more, affecting their thoughts and behaviour. It is a complex disorder that occurs commonly within families and typically results from a combination of genetic and environmental influences.

Professor Sarah Medland, Acting Head of our Mental Health Program, explains that it is quite a difficult disorder to diagnose.

‘Often people who have bipolar disorder present with depression first, so it can be terribly frustrating and can take many years to accurately diagnose.

‘For example, a person might experience depression on two or three occasions, but it’s not until they have a manic or hypomanic episode that it will become known that they have bipolar disorder,’ she said.

The Australian Genetics of Bipolar Disorder Study aims to discover the specific and heritable genes associated with the illness and to determine why some people respond to a certain medication but not others.

‘If we can discover the significant genes that are specific to bipolar disorder, we will be able to fast-track people’s treatment plans. Our hope is that people could take a genetic screening test before being prescribed medication, with the view that they could be prescribed a potentially more-effective medication first and ultimately find a treatment that works faster for them.

‘Likewise, for those people who are being treated for major depression but are not responding to medicine, doctors could consider prescribing bipolar disorder medications to people who screen positive for bipolar disorder, even before their patient has a manic episode,’ she said.

Lithium, first introduced as a treatment by Australian Dr John Cade AO in 1949, is one of the most common medications prescribed to treat bipolar disorder and is one of the medications people are usually prescribed first.
However, about 30 per cent of people do not respond to lithium and an additional 20–30 per cent of people get some relief of symptoms, but they will find they experience other symptoms and/or have negative side effects.

‘If we were able to identify those people who are likely not to respond to lithium at the outset, then we could prescribe a different and potentially more-effective medication first,’ she said.

Professor Medland and the team are motivated to make a difference for individuals who are facing diagnostic uncertainty, particularly for individuals who are following their treatment plans, doing everything their doctors are advising, but are not seeing an improvement in their overall mental health.

The immediate aim of the study is to recruit as many individuals as possible who have been treated for bipolar and are willing to be a part of the study. If you choose to participate in the study there is an online survey to complete — similar to an online interview — which takes about 20–30 minutes. You then receive a DNA kit in the mail to submit a saliva sample, which you just send back in the reply paid envelope.

Professor Medland is incredibly grateful to all of the participants who choose to give their time and take part in this study — and any medical research studies.

‘We are hoping to recruit participants within the next six months, then it will take about a year to prepare the genetic data and complete the genetic analyses,’ she said.

Recruitment for the Australian Genetics of Bipolar Disorder Study is now open.

If you are interested in being involved, please visit the website [www.geneticsofbipolar.org.au](http://www.geneticsofbipolar.org.au) and follow the link to participate, or for any general enquiries please email [gbp@qimrberghofer.edu.au](mailto:gbp@qimrberghofer.edu.au) or call 1800 257 179.

Participate in other research studies!

Visit our website to view all of the medical research studies that are currently open: [www.qimrberghofer.edu.au/our-research/participate-in-our-research/](http://www.qimrberghofer.edu.au/our-research/participate-in-our-research/)

Professor Sarah Medland
Acting Head of the Mental Health Program
at QIMR Berghofer
The Ovarian Cancer Prognosis and Lifestyle (OPAL) Study includes almost 1000 women who were diagnosed with ovarian cancer between 2012 and 2015. These generous women have given their time and experience living with ovarian cancer to help uncover the truths related to diet, lifestyle and cancer survivorship.

Professor Penny Webb, Head of the Population Health Department and Gynaecological Cancers Group, is leading the OPAL Study, which is the largest research project in the world studying how lifestyle may influence quality of life and outcomes in women with ovarian cancer.

Professor Webb and her team are tracking the progress of the women in the OPAL study for up to eight years. Collectively, the women have completed almost 8000 diet and lifestyle surveys and Professor Webb hopes that analysing this data will provide the first clear evidence regarding the potential role of diet and lifestyle in ovarian cancer survival.

Why are survivorship studies important?

Ovarian cancer is often diagnosed at an advanced stage when the tumour has already spread to other organs and, as a result, it has a poor prognosis. Every year, more than 1600 Australian women are diagnosed with ovarian cancer and almost 1100 women — three women every day — lose their life to the disease.

While we know that a good diet is important for a healthy life in general, there is currently no evidence as to whether it might also be able to stop a cancer from returning.

‘This research is important, because women diagnosed with ovarian cancer want to know what they should be doing to increase their chance of survival post-treatment,’ Professor Webb said.

‘When I’m talking to women, they often want to know how they should be living their lives to make sure the cancer doesn’t come back.’

- Professor Penny Webb

How lifestyle impacts survivors of ovarian cancer

Professor Penelope (Penny) Webb and her research team are dedicated to collecting data that will reveal the answer to this question, and many more, as they conduct a 10-year longitudinal study looking at the effects of diet and lifestyle on survival among women with ovarian cancer.
‘When I’m talking to women, particularly after they have finished treatment, they often want to know how they should be living their lives to make sure the cancer doesn’t come back.

‘My hope is that we will be able to give them some useful evidence-based guidance, and the results will show that there are things women can do to take charge of their health post-treatment,’ she said.

With a large proportion of cancer research focusing on new medicines and treatment options, the goal of this longitudinal study of survivorship is to identify those lifestyle factors that can prevent the cancer from recurring.

‘Health is important to all of us, and if we don’t engage in medical research now it will never get better. I want to conduct research that will make a difference to women and their families. It would be nice to make a difference today, but the nature of a study like OPAL is that it takes many years to complete. I hope it will make a difference in the future,’ Professor Webb said.

Professor Webb is grateful for the remarkable level of support given by the participants of the study, recognising that survivorship research is only made possible because of their dedication and commitment.

‘I have enormous gratitude for the amazing women who take part in our OPAL study, many with the hope that this may one day help other women like themselves,’ she said.

‘I have friends and family who have been diagnosed with ovarian cancer. At a personal level, I’d like to know that there’s good news for them,’ she said.

Objectives and early findings

The overarching premise of the study is: can lifestyle choices, such as following a healthy diet, prevent ovarian cancer from recurring?

• Diet: A previous study found that women with ovarian cancer who ate a diet with lower saturated fat, higher fibre, more green leafy vegetables and lower glycaemic index (GI) levels — all indications of a healthy diet — may have better survival. But in this, and all other studies that have looked at diet and ovarian cancer survival, scientists only had information about what women had eaten before their cancer diagnosis. OPAL is the first study to look at whether what women eat after their diagnosis might affect survival.

• Lifestyle: Early analyses of the OPAL data show that women often change their lifestyle after diagnosis. For example:

  - Eleven per cent of women reported smoking one year before their diagnosis, but almost two thirds of these women stopped smoking after their diagnosis and more than half were still not smoking a year later.
  - After they had finished treatment, half of the women reported lower levels of physical activity than before their diagnosis, but almost one third reported doing more exercise.
  - Time spent sitting or inactive increased by an average of one hour per day during treatment and did not increase again after women finished their treatment.
  - Women who did more exercise early during their treatment reported less fatigue at the end of treatment.

• Quality of life: Ongoing analyses are investigating whether these and other lifestyle factors, including the use of common medications, may influence quality of life and survival.
QIMR Berghofer scientists have helped map the most complete genetic picture of the potentially deadly *Aedes aegypti* mosquito. The international breakthrough could help stop the spread of several debilitating mosquito-borne viruses in the future.

The *Aedes aegypti* mosquito is one of the most widespread, disease-carrying mosquitoes in the world, putting more than half the global population at risk. Commonly known as the ‘dengue mosquito’ in north Queensland, it transmits several dangerous viruses including dengue fever, Zika, chikungunya and yellow fever.

In a bid to protect us from these buzzing, biting critters, scientists have mapped their genetic blueprint, making inroads into what makes them bite some people, but not others, and revealing new ways to control the mosquito.

Dr Gordana Rasic and Igor Filipovic from QIMR Berghofer’s Mosquito Control Laboratory were the only Australian scientists involved in the world-wide study that involved 72 scientists from seven countries.

‘This genetic map is a resource that will significantly improve our chances of controlling these mosquitoes and preventing the diseases they transmit.

‘We have identified many new genes, such as those that affect how mosquitoes target to bite us, which will help design better repellents and insecticides,’ Dr Rasic said.

Insect repellents containing N,N-Diethyl-meta-toluamide (DEET) are the only products currently available that she recommends to repel mosquitoes.

‘Our role at QIMR Berghofer was to find the genes that make *Aedes aegypti* such an efficient transmitter of dengue,’ she said.

The international collaboration was formed in 2016, just over two years after the outbreak of Zika virus in South and Central America, and the World Health Organization’s (WHO) declaration of a Public Health Emergency.

‘For more than a decade, we’ve been hampered by a lack of a true understanding of the genetic makeup of these mosquitoes.

‘We joined forces to work on the project, because no single researcher could have done it alone. The progress was very rapid and a testament to how well scientists can work together when they have an urgent common goal,’ she said.

*Aedes aegypti* is not just an overseas problem — these mosquitoes are responsible for the spread of dengue fever on mainland Australia. They constantly threaten to invade South East Queensland from their existing strongholds in central and northern Queensland, and our seaports and airports are under constant risk of these mosquitoes arriving from overseas.

QIMR Berghofer’s Mosquito Control Laboratory is the largest and best-resourced in the southern hemisphere, allowing Dr Rasic to be a key partner in this international mosquito study.

‘*Aedes aegypti* is a nasty, disease-carrying pest and we are really excited to be part of an important project that provides new ways to beat this mosquito and the diseases it transmits,’ Dr Rasic said.
If you have a taste for coffee and want to drink a lot of it, you were probably born that way.

A new study shows a person’s perception of bitterness, which is determined by their genes, could dictate if they prefer coffee or tea and if they drink a lot or little.

The study was co-led by PhD student Jue Sheng Ong, who analysed bitter taste perception genes using data from more than 400,000 participants.

Mr Ong said people with genes that made them better able to taste the varied types of bitterness in caffeine or certain vegetables preferred different beverages.

‘Coffee, tea and alcohol are widely consumed drinks that have a bitter taste, and have been found to have beneficial and adverse health effects.

‘We identified that people who tasted the bitterness in caffeine were more likely to love coffee and drink more of it. However, people who were less able to taste the bitterness weren’t as keen on coffee,’ Mr Ong said.

‘On the other hand, if you were genetically predisposed to taste the bitterness in brussel sprouts, then you were more likely to prefer a cup of tea over coffee.

‘The results were similar for other vegetables high in the compound propythiouracil (PROP), such as broccoli.

‘This study provides some answers about why certain people are at higher risk of heavy consumption of these bitter drinks,’ he said.

The head of QIMR Berghofer’s Statistical Genetics research group, Associate Professor Stuart MacGregor, said showing the link between taste perception and consumption could have implications for future research.

‘It improves our understanding of people who are big drinkers of alcohol or coffee and opens the door to new research into treatments.

‘We know that there are lots of factors which affect how and why people drink certain things, but this study highlights the importance of taste genetics on our drinking habits,’ Associate Professor MacGregor said.

A love of coffee is written in our DNA

**Coffee by numbers**

- Light coffee drinkers were classified as those who drank fewer than two cups per day, while heavy coffee drinkers drank more than four cups.

- Heavy tea drinkers were classified as those who drank more than five cups per day.
Every year people send away DNA samples to explore family history, participate in genomic research or have a diagnostic test. The collection of this data is vitally important to many research studies as it can help doctors understand how the genome impacts human health. However, you have the right to determine how and when your information is used or stored after you get your results. Yet many people do not know this, or take steps to take control of their genetic information.

Commercial companies and your DNA data

Last year an ancestry DNA testing company, 23andMe, entered into an agreement with pharmaceutical company, GlaxoSmithKline, whereby 23andMe would provide customers’ DNA data to GlaxoSmithKline for medical research purposes.

This commercial agreement was possible because 23andMe’s customers had agreed to the company’s terms and conditions. The simple act of submitting their sample automatically meant they agreed to DNA data being shared for research purposes.

Not all commercial companies take this approach. Some companies give customers the choice to have their DNA data shared with researchers or other organisations and require the customer to actively opt in or out of information sharing.

If you are thinking about taking a commercial DNA test, it is worth looking at the terms and conditions to see how your DNA data will be shared. Words to look for in the terms and conditions are ‘informed consent’, ‘research consent’, ‘biobanking’, ‘commercial partners’ and ‘secondary use of data’.

Implications for medical research

In Australia, medical research — including projects that use people’s DNA data — must be approved by a Human Research Ethics Committee. These committees review a researcher’s application using a set of national standards to ensure the research is being conducted in an ethical manner.

When volunteering your sample or DNA data for use in research projects, like those at QIMR Berghofer, you will be asked to consent to the research project. This is to make sure you have all the information necessary to make an informed decision to be involved in the research project.

You may be asked to consent to researchers using your DNA data for future ethically approved studies that may be related to the original project or a completely unrelated project. It is your choice to accept or decline this request.

Public health and sharing genomic information

Similarly, your pathology samples may be stored for a nominated period of time, where they become part of your medical record. Researchers can apply to Queensland Health to access your data or samples from your medical records for projects that are approved by a Human Research Ethics Committee.

At this time it is uncommon to have DNA data, in the form of a patient’s genome, to be stored by Queensland Health. However, this will soon change Genomics can be used to diagnose rare diseases, identify patient risk of developing some diseases and help doctor choose medications.

Genomics, as a diagnostic test, is being implemented in Queensland’s health system through a number of federal and state-funded initiatives, including the Queensland Genomics Health Alliance (QGHA).

As the storage of genomics data from diagnostic tests is incorporated into Queensland’s health system, genomic data access policies are being developed. QIMR Berghofer is proud to play an integral role with three staff members appointed in key leadership positions within the QGHA Capability and Infrastructure Working programs.

Have your say

How do you feel about genomic information from your medical records being shared with researchers? Complete the QIMR Berghofer Genomics Survey at www.qimrberghofer.edu.au/dna-sharing-survey.

It’s your choice to share your data

The new online My Health Record is a related initiative, whereby, if you are happy for your data to be used for public health and research purposes, you don’t need to do anything. However, if you do not want your health information shared for public health and research purposes, you have the choice not to participate.
Q&A

What is your area of research and can you explain the most promising research project you are working on?

My lab aims to understand the roles of cellular fats in health and disease. We use advanced mass spectrometry technologies to achieve this goal. Mass spectrometry is like a very fine balancing scale that measures minute differences in the weight of molecules. This helps us to determine what molecules are in our samples. We are also working to improve disease diagnosis, aiming for more precise diagnosis and earlier detection of disease.

One project I am currently working on is the early diagnosis of oesophageal cancer. Recently, I led a project that discovered a group of biomarkers that are highly accurate at detecting a common form of oesophageal cancer in its earliest stages. This is significant because oesophageal cancers do not cause symptoms until they have reached an advanced stage, when they are harder to treat. I hold a vision that, in the future, a simple blood test could identify these biomarkers in patients and diagnose the cancer at an early stage.

Why is this research so important?

Early and precise diagnosis of disease will ensure patients receive the best treatment and have the best chance of survival. Fats are a fundamental component of every single cell in our body, but we have very little understanding of the diversity of fat types, and how they regulate our cell function. Cancer progression, neurological diseases and inflammation are all linked with changes in the types of fat in our bodies. If we can determine the exact fats that are detrimental or beneficial, then there’s a chance we can prevent these diseases through diet and/or exercise.

What is the one thing you hope to achieve in your scientific career, or what is your hope for the future in your area of research?

Translational research is a long process. [Translational medical research converts promising laboratory results into useful treatment methods.] It would be meaningful to me if we could implement a range of diagnostic tests into the mainstream health system that would allow early and precise diagnoses and help patients receive the right treatment quickly.

How has your scientific career evolved over the years?

I trained in cell biology and biochemistry at The University of Queensland (UQ) and overseas, and then established a translational research group at UQ Diamantina Institute on the Princess Alexandra Hospital campus to be more directly connected with patients and improving human health.

A major change in the skillset of the modern-day scientist is the ability to be fluent in computer coding and programming. It’s something I’ve had to learn during my career, where many of my PhD students are learning both laboratory and computer-based research skills from the beginning.

What do you enjoy doing in your spare time?

I don’t get much time nowadays, but I do enjoy playing music, sometimes together with my son on the cello.
For decades, scientists have known that genetics play a role in a person’s susceptibility of developing cancer and disease. Robyn Britton has experienced this first-hand and draws from this experience as she makes regular and generous contributions to QIMR Berghofer.

The source of Robyn’s philanthropy is the Laurence Edward Wilkins Foundation, of which she is a trustee, with her daughter. Laurence was Robyn’s uncle, who had a passion for finding better treatments for people diagnosed with cancer, after seeing his brother suffer with stomach cancer in the 1980s.

Likewise, Robyn has a trifecta of stories to share. Sadly, her husband Ben was diagnosed with prostate cancer, which later claimed his life. Shortly after his death, Robyn had her own brush with the deadly disease and was diagnosed with breast cancer. Then the news came that one of her daughters carry the hereditary BRCA2 gene, while both carry the CBH1 gene mutation, which significantly increases their chances of developing breast, stomach or bowel cancer at an earlier age. And so it goes...

“It’s such a dreadful disease that has the power to tear families apart and take our loved ones before their time. ‘I’ve been lucky. I was diagnosed early and was able to get my breast cancer under control, but I know others aren’t so fortunate. ‘Knowing that we carry the genetic predisposition for cancer, I’m committed to doing what I can to ensure better treatment and hopefully solutions are discovered in the near future to help my children and grandchildren,’ she said.

Through the Foundation, Robyn funds various cancer-related endeavours including cancer research, medical equipment for cancer research and patient care for people diagnosed but unable to shoulder the financial burden of cancer treatment.

She has generously supported four researchers at QIMR Berghofer, who are making new discoveries in breast cancer, immunology, prevention and diagnostics.

Dr Michelle Wykes is one of the researchers conducting breast cancer research and reiterates that the challenge isn’t the science, it’s the funding. ‘Major gifts and philanthropic donations are graciously accepted, ensuring we can continue to step into the unknown and make the ground-breaking discoveries into new medicines and treatment methods,’ Dr Wykes said. ☞
Global Achievements and Award Recognitions

Congratulations to the following QIMR Berghofer scientists who received awards for their outstanding contributions to medical research in 2018.

Professor James McCarthy has been elected a Member of the Australian Academy of Health and Medical Sciences.

Professor Rajiv Khanna AO was named 2018 Professional of the Year at the India Australia Business Community Awards.

Associate Professor Michelle Hill has been elected the Secretary General of the Human Proteome Organisation (HUPO) at the HUPO 2018 Meeting.

Dr Justin Chapman was the winner of the Individual Award and the Not-for-Profit award at the Mental Health Week Research Awards.

Dr Lucia Colodro Conde was awarded the Fuller and Scott Early Career Award for outstanding scientific accomplishments and service to the field at the Behaviour Genetics Association Meeting (pictured).

Professor Don McManus was award the prestigious 2018 Sornchai Looareesuwan Medal for his achievements in tropical medicine research.

Professor Scott Bell won the Australian Infectious Disease Research Centre Eureka Prize for Infectious Disease Research.

Phil Mosley won the Postgraduate Student Researcher Award at the Australian Society for Medical Research (ASMR) Queensland Health and Medical Research Awards.

WHAT’S ON

FEB 21 Dementia Public Forum

Thursday 21 February 2019 at 6pm
QIMR Berghofer
Medical Research Institute
300 Herston Rd,
Herston QLD 4006

QIMR Berghofer is holding a public forum. Our leading researchers will answer your questions, present information, including assessments of younger patients, brain imaging and early diagnosis, and update you on our major five year Alzheimer’s study ‘PISA’. Register your interest to attend by emailing events@qimrberghofer.edu.au or call 1800 993 000.

MAR 1–30 World Science Festival Brisbane

Various forums, information sessions and street festivals visiting locations throughout Queensland, including Brisbane, Gladstone, Chinchilla, Ipswich, Toowoomba and Townsville. For the 2019 program visit www.worldsciencefestival.com.au/

QIMR Berghofer is hosting Immunologist’s Apprentice sessions on 20–22 March. The Apprentice programs are small, hands-on workshops where scientists, technologists and innovators educate curious minds on the workings and wonders of their chosen fields. Program is best suited to participants School Years 10 to 12. Bookings are now open. www.worldsciencefestival.com.au/education-program/

MAY 23-25 Brisbane Immunotherapy Conference 2019

Saturday 25 May 2019 at 8am
Merivale St & Glenelg Street,
South Brisbane QLD 4101
www.qimrberghofer.edu.au/brisim19/

The three-day conference agenda includes a public forum that will be held at 8am on Saturday 25 May. This is a free event open to the public and will give attendees the opportunity to learn about new therapeutic treatments that may be available soon and pose questions to international immunotherapy research and clinical professionals working to combat cancers, autoimmune disorders and transplant rejection. For updates on the public forum please contact us at conferences@qimrberghofer.edu.au or call 1800 993 000.
Donations in lieu of presents

In 2014, Kathryn Collinge lost both of her parents to cancer within months of each other, so when she tied the knot earlier this year, instead of gifts, she asked her guests to make a generous donation to QIMR Berghofer. She had beautiful envelopes created for the event, where guests placed their donations in a wishing well. They raised $700 that will help progress our breast cancer research, helping others live longer and healthier lives. If your family or friends wish to do the same – donate in lieu of gifts for weddings, birthdays or anniversaries – please make contact at supportus@qimrberghofer.edu.au.

Peter Russo’s Ride in Taiwan

Peter Russo has been supporting the Ride to Conquer Cancer for many years. This year, he decided to take his support one step further and ride around Taiwan, as part of a Rotary Ride, where he raised awareness and much-needed funds for QIMR Berghofer. The nine-day ride involved over 100 other riders, with Peter choosing QIMR Berghofer as his charity of choice. He raised over $5300. Peter Russo is a prominent member of the community. After a celebrated career in law, as the Principal of Russo Lawyers and named the Australian Newspaper’s Australian of the Year in 2007, he is now a Member of Parliament representing the State Seat of Toohey. Thank you for your ongoing support Peter!

Tour de Cure

Dr Siok Tey, Team Leader of the Translational Cancer Immunotherapy Lab, gratefully accepted a cheque on behalf of QIMR Berghofer for $10 000 from Tour de Cure Australia and Commonwealth Bank Can4Cancer. The funding will be used to purchase an incubator critical to growing immune cells suitable for cancer immunotherapy treatments. Thank you to Tour de Cure and the 400 Commonwealth Bank staff and corporate partners who walked 22 km on a blistering Brisbane day.

In Memory of Ron

Sharon McCartney set up an In Memory fundraising website, with all proceeds donated to QIMR Berghofer, for her husband Ron, affectionately known as Arpy, who passed away from prostate cancer last September 2018. He was doing poorly, he hadn’t eaten in days and was very weak, so Sharon called the ambulance to take him to hospital. Before they left, the paramedics asked, ‘If he could eat anything what would it be?’ He immediately said, ‘A caramel sundae’. His wish was granted as the ambulance swung into the nearest McDonalds. A few days after he passed, this story made the evening news as well as some overseas media. Ron was diagnosed in 2001 after an older brother found out he had the disease and encouraged his remaining three brothers to go and get checked as well. As it would happen, the gene for prostate cancer runs in their family, with all five brothers diagnosed with prostate cancer, as well as two nephews.
Donor Thank You Event – October 2018

We acknowledged the spirit and generosity of our donor community and their families and friends at our Donor Thank You Event. Over 90 people attended to view their plaque on the Wall of Appreciation at the state-of-the-art medical research facility, received an address of research highlights from Director and CEO Professor Frank Gannon, and enjoyed a tasty high tea. It was a most elegant and informative day out.
2019 HIGH SCHOOL EDUCATION PROGRAM

KEY DATES & ACTIVITIES

We are committed to inspiring the next generation of medical researchers.

DAY IN THE LIFE OF A SCIENTIST

The Day in the life of a scientist program is a one-day hands on experience for Year 10, 11 and 12 students considering science as a career path. Students will conduct experiments with scientific equipment in the education lab, tour the medical research institute and have the opportunity to meet a scientist. This opportunity is open to senior classes from any high school or secondary college, and operate all year round.

Further information, including booking applications, can be found here:


HIGH SCHOOL LECTURE SERIES

This free one-day interactive program allows students to hear about the latest medical research discoveries, tour state-of-the-art laboratories and investigate careers in science. Lectures are held in the auditorium at QIMR Berghofer.

We offer four Lecture Series dates in 2019:
• 1 May        • 2 May       • 23 July       • 24 July

LABORATORY WORK EXPERIENCE

This is the ultimate experience for dedicated senior year 11 and 12 science students. Immense yourself on this 3-day work experience program, offering introductory laboratory training in our purpose-built Education Lab, followed by placement in one of our working research labs. We encourage you to apply with another student from the same school where possible, as you will be working in pairs in the laboratory.

Spaces are highly revered and students are encouraged to apply online.

Applications open 4 February and close 1 March 2019.

www.qimrberghofer.edu.au/laboratory-work-experience

We offer three Work Experience sessions in 2019:
• 13 – 15 May      • 1 – 3 July      • 30 September – 2 October

TEACHER PROFESSIONAL DEVELOPMENT

Senior secondary school teachers can experience medical research first-hand at QIMR Berghofer in our Teacher Professional Development Workshop. This one day program empowers teachers to conduct hands-on genetics and microbiology activities in their classrooms. Held in our state-of-the-art education laboratory, the workshop aligns with the Australian Curriculum for Science and the new QLD Senior Biology Syllabus. For further enquires contact our education coordinators at schools@qimrberghofer.edu.au.

We offer two Teacher Professional Development Workshops in 2019:
• 21 October 2019       • 29 November 2019

For more information on the Education Program visit the website or make contact directly with our Education Coordinators:

www.qimrberghofer.edu.au/students/school-students

schools@qimrberghofer.edu.au,