The world’s largest skin cancer genetics study - can you help?

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Surprise tapeworm discovery reveals new hope for cancer research

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Bullying: a precursor to mental health conditions experienced in adolescents

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It has been a privilege to work alongside Professor Frank Gannon as his Deputy Director for the past three and half years. Frank has been a visionary leader of the Institute since he arrived in Brisbane almost a decade ago, and he leaves a lasting legacy of research excellence that will endure. In particular, he was a champion for promoting the importance of collaborations with industry to ensure that our discoveries are delivered to the world, as well as supporting early and mid-career researchers to reach their potential.

Writing personally, I am humbled to serve as the acting Director of this amazing Institute while we await the official announcement of the eighth Director and CEO of QIMR Berghofer, which we anticipate will be soon.

As many readers will know, the year 2020 marks a special occasion for QIMR Berghofer, as the Institute celebrates its 75th anniversary: on 6 September 1945, a Bill was introduced into Queensland Parliament to establish ‘the Queensland Institute of Medical Research’.

In this edition, we pay tribute to both Frank and the 75th anniversary of the Institute. Turn to pages 12–15 to read more about these topics.
We also feature articles on some of the ground-breaking research currently in progress at the Institute. Examples include the QSkin Genetics Study, which is entering the next phase of research by calling for new volunteers; research into the tapeworm that reveals new hope for cancer treatment; an article on research-led healthy behaviours to kick-start 2020; and our report on the rise of chronic liver disease in Queensland.

As we begin the next decade, we look with hope and expectation toward the future. Your contribution to medical research is helping to ensure a happier and healthier future for generations to come. From all of us at QIMR Berghofer, we sincerely thank you.

Professor David Whiteman AM
Acting Director and CEO

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Cover image:
Genetics of skin cancer illustration promoting the QSkin Genetics Study
Artist: Madeleine Kersting Flynn
Australia has the highest rates of skin cancer in the world, with 2 in 3 people diagnosed with a skin cancer by age 70.

Each year more than 400 000 Australians are treated for all forms of skin cancer, including melanoma, squamous cell carcinoma and basal cell carcinoma. More than 12 000 of these diagnoses are melanoma, which is the deadliest type of skin cancer.

With the Sunshine State still taking out the title as skin cancer capital of the world, QIMR Berghofer has a special interest in finding out what drives this disease.

QIMR Berghofer Senior Scientist Professor David Whiteman AM said the research team needs to collect DNA samples from a further 20 000 adults – including people with and without skin cancer, and with a range of skin types – to better understand the role genes play in these diseases.

The research is open to Australians aged 18 and over to take part in the study.

‘We would like to recruit adults of all ages, and with a range of skin tones. We are particularly urging Australians aged over 30 to sign up,’ Professor Whiteman said.

‘You don’t have to have had skin cancer to sign up. It’s just as important for people with no history of skin cancer to join this study so we can find the ‘protective’ genes that reduce the risk of these cancers.’

Professor Whiteman said QIMR Berghofer researchers had already collected genetic data from more than 18 000 QSkin participants – some dating back to 2011 – and wanted to strengthen the study with DNA from a further 20 000 Australians.

‘We now want to find out what genes are involved that put people at an increased risk of developing skin cancer.’

‘Our aim is to collect genetic information for at least 38 000 people because genetic studies need very large numbers of participants to have enough statistical power to find the important genes.

‘By comparing genetic data from a large cross-section of people, we will also get vital information about how skin cancers develop, so we can work towards better ways of preventing and treating them.’
It’s easy to be involved in the QSkin study

The study’s project manager, Associate Professor Catherine Olsen, said participating in the research was easy and unobtrusive.

‘DNA collection has changed considerably over the years and now only requires participants to provide a saliva sample. We also want our volunteers to take a short survey about their general health, skin characteristics and sun habits,’ she said.

‘The DNA samples will allow us to see how genes vary for different people, and how they might be related to skin cancer risk.

‘We want to find out why some people get skin cancers and others don’t. These large genetic studies are the best way of answering those questions.’

To find out more information or take part in the study visit the QSkin Genetics web page: https://www.qimrberghofer.edu.au/qskin-genetics.

The Institute has a legacy in skin cancer research

QIMR Berghofer has been researching skin cancer in Queensland for more than 30 years, with many researchers making discoveries and contributing knowledge to the field. Here is a glimpse.

In 1992, Professor Adele Green AC began the landmark study of sunscreen usage in the rural Queensland town of Nambour. Half of the 1621 participants applied sunscreen daily and the other half maintained their previous sporadic sunscreen application habits, where the participants were monitored for 10 years. This community-based skin cancer study would shape the next 20 years of skin cancer research.

The Nambour Skin Cancer Trial was the first to establish that applying sunscreen daily can halve the risk of melanoma, which was the point of reference for prevention research and public awareness campaigns.

In 2011, Professor Whiteman and Associate Professor Olsen then launched the QSkin Sun & Health Study.

‘We recruited more than 44 000 Queenslanders 10 years ago to take part in the first stage of our QSkin study so we could document the burden of the disease and better understand how skin cancers develop. More than 18 000 of those people gave us a DNA sample when we approached them five years later. Now, we want to double the number of DNA samples for the next stage of our research,’ Professor Whiteman said.

‘The first stage of our QSkin study helped us develop a melanoma risk predictor, which is now online and available for public use.’

Research into inherited genes is the next stage of the team’s skin cancer research in QSkin Genetics.
Dr Shiwanthi Ranasinghe started her career like any other scientist. She selected an area of research for her PhD – the tapeworm – and set to work finding out everything she could about these tiny parasites in the hope of finding a way of preventing infection.

There is currently no prevention for tapeworm infection and that affects thousands of people in both developing and developed countries.

The aim of the research was to learn how the tapeworm survives in humans, so they could develop a vaccine to prevent people becoming infected in the future.

While researching the tapeworm genome at QIMR Berghofer’s Infectious Diseases Program, Dr Ranasinghe and the team discovered the tapeworm has a unique defence mechanism — one that proves beneficial for treating a completely unrelated disease.

‘The tapeworm secretes a protein as a defence mechanism to survive the acids produced by the human gut,’ Dr Ranasinghe, from QIMR Berghofer’s Molecular Parasitology Laboratory, said.

‘Further research has revealed that this protein can inhibit the enzymes that cancer cells produce.’

Dr Ranasinghe explains that healthy cells move through a normal lifecycle that ends in the cell dying, but cancer cells are different in that they don’t die and instead multiply. However, this protein secreted by the tapeworm kick-starts the natural cell lifecycle in cancer cells, resulting in the death of cancerous cells.

By stopping the cancer cells’ enzymes, the tapeworm’s secretions prevent the cancer from growing and can even start to kill it.

‘The tapeworm secretes a protein as a defence mechanism to survive the acids produced by the human gut. Further research has revealed that this protein can inhibit the enzymes that cancer cells produce.’

- Dr Shiwanthi Ranasinghe
‘In the lab, we’ve seen a significant reduction in the growth of breast cancer and melanoma cells when they are treated with this protein,’ she said.

‘Something as simple as this, which is really quite a basic anti-cancer agent, certainly needs to be pursued further,’

- Professor Don McManus

‘It was an accidental finding, but it’s very exciting,’ she said.

The discovery is the result of a successful internal collaboration, working with Professor Glen Boyle in QIMR Berghofer’s Cancer Drug Mechanism research group. Dr Ranasinghe’s supervisor, senior scientist Professor Don McManus, is a great supporter of this research.

‘The protein seems to be effective against a whole range of cancers,’ Professor McManus said.

‘Something as simple as this, which is really quite a basic anti-cancer agent, certainly needs to be pursued further,’ he said.

Dr Ranasinghe was selected as one of 10 finalists from nearly 200 applicants in the Queensland division of the 2019 Fresh Science competition. Fresh Science is a national competition that helps early-career researchers share and communicate their stories of discovery with a day of media training and public speaking.

This breakthrough is an unexpected surprise, but poses a challenge for the next stage of research that would hopefully lead to clinical trials in people.

Unfortunately, the discovery can’t progress any further without funding.

About 150 000 Australians are diagnosed with some form of cancer every year. It is discoveries like this that show hope can be found in unexpected places, and we never know where the next scientific breakthrough in cancer research is going to come from, or where it may lead.

If you would like to see research like this progress, please give now at: www.qimrberghofer.edu.au/donatenow.
The essence of the research at QIMR Berghofer is to help people lead longer, healthier lives. To help you start 2020 on the path to good health, here are six healthy behaviours that QIMR Berghofer research endorses.

1. Maintain a healthy weight
   A QIMR Berghofer study has found people who are overweight could reduce their risk of dying from cancer later in life by shedding some kilograms and maintaining a healthy body mass index (BMI).
   Associate Professor Stuart MacGregor said it was important for people to realise they could change their cancer risk because only a third of weight gain was attributable to a person’s genetics while two thirds was due to lifestyle and environment.
   ‘Excess weight has the biggest impact on some of the most aggressive and deadly cancers such as those of the oesophagus and endometrium,’ Associate Professor MacGregor said.

2. Get moving
   International research bodies have declared physical inactivity to be a cause of cancer, and Australian Bureau of Statistics figures show 48 per cent of Australian adults do not do enough physical activity.
   A QIMR Berghofer Medical Research Institute study has found up to 2 per cent of all inactivity-related cancers such as colon, postmenopausal breast and endometrial cancers could be prevented if Australians did five hours of moderate-intensity physical activity or 2.5 hours of vigorous exercise each week.

3. Eat fruits and vegetables
   Research strongly suggests that eating a wide variety of fruit and vegetables helps reduce the risk of heart disease and some cancers.
   ‘The thought of making major lifestyle changes can be overwhelming, but adding some extra fruit and vegetables to your diet is a simple step you can take today.’
   The messaging from government campaigns remain the same – eat two fruits and five serves of vegetables every day.
Stay sun smart

Two in three Australians will be diagnosed with skin cancer by the time they are 70, with more than 750 000 people treated for one or more non-melanoma skin cancers in Australia each year.

A new Sunscreen Policy – spearheaded by QIMR Berghofer – has been introduced recommending sunscreen with a sun protection factor (SPF) of at least 30+ is applied every morning when the maximum UV index is forecast to be three or higher.

‘We have clear evidence on the benefits of daily sunscreen use and urge Australians to apply sunscreen as part of a daily routine,’ Associate Professor Rachel Neale said.

‘If you can stop the accumulation of sun exposure over time, you are going to reduce your risk of skin cancer.’

Stop smoking - yesterday!

Lung cancer continues to be the leading cause of death of all cancers worldwide. The Australian Institute of Health and Welfare (AIHW) 2019 reported exposure to tobacco accounted for two in three lung cancer cases.

‘By far the biggest preventable cause of cancer deaths in Australia is tobacco smoke. Cancer caused by smoking and passive smoking killed 9921 people in 2013 and accounted for 23 per cent of all cancer deaths,’ Professor David Whiteman said.

If you currently smoke, seek advice on how to quit by making an appointment with your doctor or phone Quitline on 13 78 48.

Limit alcohol consumption

QIMR Berghofer research has shown nearly 30 000 cases of cancer could be prevented in Australia over the next 25 years if everyone stuck to the government’s alcohol guidelines of no more than two standard drinks per day.

‘We examined a number of different scenarios to determine what effect changes in drinking would have on the number of people presenting with alcohol-related cancers,’ Professor David Whiteman said.

‘It’s been well established in previous studies that alcohol is a risk factor in cancer, particularly cancer of the mouth, pharynx, larynx, oesophagus, breast, bowel and liver.

‘Our study found changes in alcohol consumption would have the biggest impact on bowel cancer, with more than 16 000 potentially preventable cases and then breast cancer, where just over 4000 cases could be prevented.’
The complexities of bullying: school-based versus cyber bullying

Dr Thomas and the team were interested to understand the overlapping relationship of school-based bullying – also called face-to-face bullying – and its online counterpart, known as cyber bullying.

In 2017, the team completed a study involving adolescents aged 11 – 17 to self-report on their bullying experiences over the previous 12 months.

Bullying consists of three elements: the person who bullies intends to cause harm, the actions are repeated and there is a power imbalance between the person bullying and the individual being bullied.

The results revealed the overwhelming majority of young people – 70 per cent of respondents – who had been victimised by their peers in that previous year experienced it solely in the school environment.

About 25 per cent of young people experienced bullying both online, as well as in the school yard.

‘When we talk about the concept of bullying, what this data illustrates is that these “online worlds” facilitated by the new technologies doesn’t necessarily create new victims of bullying,’ Dr Hannah Thomas said.

‘It’s an extension of what’s happening within that school environment, or within that main peer group environment which is where kids socialise at school.’

Link between bullying and mental health

Over the past seven years, Dr Thomas’s research has helped form the body of evidence to show that bullying causes mental health problems, like other forms of victimisation which children and young people experience.

‘It has required a significant amount of time to test the relationship and demonstrate that it’s not just the bullied kids who end up having mental health problems, but that is also detrimental to all members of the community,’ Dr Thomas said.

‘Specifically, victims of bullying have an increased risk of experiencing mental health conditions, and...
the perpetrators are more likely to have poor educational outcomes.’

Furthermore, there is an often forgotten group of young people that sit in the overlap — who are both victimised by their peers, but also engage in bullying behaviour. She says this overlapping group tend show the worst mental health outcomes.

‘We know that 50 per cent of clinically significant mental health disorders commence by the age of 15, and 75 per cent onset before the age of 25, so early intervention and prevention is crucially important,’ she said.

Preventative strategies the focus for future research

The research group aims to focus on preventative strategies in future projects, including within families and school communities.

‘There’s certainly growing evidence for school-based intervention that involves school communities – teachers, parents and students – in what we call a whole school approach to bullying intervention.

‘Everybody is educated on this issue and is really encouraged to act in a proactive and supportive way,’ she said.

‘We know that families and supportive parents are really important in helping a young person manage peer difficulties, and help them to be able to resolve issues.’

How parents can help their children

The greatest advice for parents and grandparents is to start initiating the conversation with young people about their interactions with others.

‘It is really important to talk to young people about what respectful relationships are, whether those relationships be with their peers, their family, or their school,’ she said.

‘Then modelling to our young people how to have respectful and positive relationships, showing them that difficulties can be resolved effectively by taking a cool, calm and collected approach to work through these difficulties.’

‘We’re actually helping young people move through what can often be a difficult transition – from childhood-adolescence into early adulthood – and making sure they have the social and emotional skills to be able to get along in life with others.’

‘It’s really about starting conversations with our children about their interactions with others and seeking professional help if their difficulties are significant,’ she said.

If you need assistance from a mental health service provider about adolescent bullying, you can contact Kids Help Line on 1800 55 1800, Lifeline on 13 11 14 or eheadspace on https://headspace.org.au/eheadspace/. ●

Dr Hannah Thomas, Visiting Scientist, Child and Youth Mental Health Group at QIMR Berghofer
Farewell to our Director and CEO

On 3 January, we farewelled retiring QIMR Berghofer Director and CEO Professor Frank Gannon after nine years of inspiring leadership and a decades-long international career.

Professor Gannon joined QIMR Berghofer in early 2011 from the Science Foundation Ireland, where he was the Director-General. Prior to that, he was the Executive Director of the European Molecular Biology Organization in Germany. His research focused on the regulation of gene expression by the oestrogen receptor, which plays a major role in breast and endometrial cancers.

Described by his peers as a ‘collaborative visionary’, Professor Gannon has made an indelible contribution to biomedical research in Queensland and around the world as an esteemed molecular biologist, cancer researcher and science administrator.

Hundreds of staff, VIPs and distinguished guests, including His Excellency the Honourable Paul de Jersey AC, Governor of Queensland and Patron of QIMR Berghofer, joined Professor Gannon at a special Festschrift event to celebrate his enduring and distinguished leadership.

He was also presented with a unique artwork painted by indigenous artist Wendy Rix.

In his farewell lecture, Professor Gannon paid tribute to his family and colleagues and thanked the researchers, his deputy directors, support staff, donors and state government for their unwavering support.

‘It has been an honour and a privilege to serve as the Director and CEO of this great Queensland institution for nearly 10 years,’ Professor Gannon said.

‘Queensland is an internationally significant hub for medical research, and I’m pleased to have played a part in that.

‘I would like to thank the many scientists, support staff and students I’ve worked with for their service and support. I am extremely proud of what they have helped the Institute to achieve over the last nine years.

‘I would also like to acknowledge the members of the QIMR Berghofer Council, who give their time and expertise to lead the Institute.

‘Moving on from the position of leading QIMR Berghofer is an important transition for me and the Institute, and I do so knowing that I am leaving QIMR Berghofer in a strong position.’

Following his retirement, Professor Gannon will stay close-by and maintain ties with the Institute, holding the appointment of Emeritus Fellow at the Institute.

Professor Frank Gannon was presented with a painting by Aboriginal artist Wendy Rix, which is comprised of elements from his country of origin (Ireland) and his new found home in Brisbane.
You have been loyal to QIMR Berghofer, donating for 30 years. Why do you give to QIMR Berghofer?

We first started giving because we received a leaflet from QIMR Berghofer through the retirees association. We did some further exploring into QIMR Berghofer, what is being done there and how the donations contribute to the research.

We found that some charities outsource their fundraising efforts and the fundraisers take a lot in commission, so the charity doesn’t receive much money. But QIMR Berghofer doesn’t do that. At QIMR Berghofer all of the money goes to the research.

What is the one area of research that you have seen progress beyond your wildest dreams?

We would have to say the tropical and mosquito-borne diseases. I find it particularly amazing that the new research has researchers releasing sterile mosquitoes into the wild, natural environment to breed and create a generation of mosquitoes that cannot carry and transmit the diseases.

Another area that is advancing is cancer research. You just never know where the research will lead - when you’re researching into one disease, you may just find something that will be beneficial for another disease.

What does it mean to you to support medical research and what keeps you giving, year after year?

Medical research benefits everyone, and its effects will be felt worldwide. There’s international research collaborations and sharing of information across borders to benefit every person in the world.

Why have you decided to leave a gift in your Will?

The work of QIMR Berghofer is of benefit to everybody and we think that’s enormously worthwhile.

Remember, you can portion the Will up and leave a percentage of your estate to relatives and people who fall on hard times, but we have chosen to leave some to QIMR Berghofer.

Where do you think medical research will be in another 75 years’ time?

I do think we’ll have a cure for cancer in 75 years’ time. Some of us seem to be more susceptible to cancer than others – researchers have proved this – and I think someone’s going to crack it one of these days. I wish I could be around to see what the work is going to be like!
The Beginning

QIMR Berghofer, established in 1945 as the Queensland Institute of Medical Research (QIMR), was the brainchild of Dr Edward Derrick, an early Director of the Queensland State Health Department Laboratory of Microbiology and Pathology.

The Institute began its operations with a staff of only seven and occupied temporary buildings (previously the US Armed Forces huts) in Victoria Park, opposite what was then the Brisbane General Hospital.

Tropical diseases

In July 1951, the Institute established a field station at the Innisfail hospital in north Queensland to learn more about the tropical diseases occurring in the local area, particularly leptospirosis (Weil’s disease or the ‘cane cutters’ curse’), scrub typhus and dengue fever.

Medical researcher Dr Ralph Doherty joined the Institute in the early 1950s. He moved to Innisfail in 1953.

Ross River virus

The discovery of Ross River virus in 1963 was made by a team led by Professor Doherty. Their research confirmed it to be the main cause of epidemic polyarthritis – painfully swollen joints and muscles, extreme tiredness, fever and a raised red rash.

Throughout this decade QIMR continued to expand, and its research into infectious diseases went from strength to strength. This time also represented a turning point for the Institute, as its researchers began to move into other areas, such as environmental causes of asthma.

Melanoma

In 1970, ground-breaking work into melanoma began at the Institute. This would lead to many important discoveries, such as the understanding of genetic influence in melanoma development.

The Institute formally established an Aboriginal health research unit in 1971 and an anthropologist joined the team of biomedical scientists. Professor Doherty believed cultural understanding was as important to success as biomedical investigations.

After more than 30 years operating in Hut 8 in Victoria Park, QIMR relocated to new laboratories in the grounds of the Royal Brisbane Hospital in 1977, heralding a new era.
It’s been 75 years since we opened the doors of a small hut in Victoria Park, ushering in a new age of medical research in Queensland. There has been incredible progress since, as the Institute has grown, with the introduction of new staff, new knowledge, and new discoveries.

### 1980s

**International recognition**

The director of QIMR at the time, Chev Kidson, was the catalyst that transformed QIMR from a small local institution into an international player.

Influenced by rapid advances in technology, four distinct programs emerged: Cancer and Cell Biology; Epidemiology and Public Health; Molecular Biology and Parasitology; and Virology and Immunology.

In 1981, a special five-year malaria vaccine project funded by NHMRC proved a major factor in the internationalisation of QIMR, placing it at the global forefront in the use of monoclonal antibody technology in parasitology.

### 1990s

**World-first immunotherapy treatment**

Cancer research accelerated and included world-first human trials to test a new genetic immunotherapy treatment against virus-associated cancer. Scientists also began to develop new methods to recognise and control organ transplant rejection without using immune-suppressing drugs.

During this decade, two new buildings were constructed: The Bancroft Centre, a memorial to the pioneering medical research family with whose history QIMR is inextricably linked, and a comprehensive cancer research centre, the Clive Berghofer Cancer Research Centre.

### 2000s

**Cell-based therapies**

Significant work was undertaken in liver disease and leukaemia during this time. Advances were made in graft-versus-host disease research, and progress was made in understanding haemochromatosis and its associated cirrhosis.

In 2004, QIMR created Q-Gen Pty Ltd as its commercial arm for the contract manufacture of cell-based therapies, including genetic immunotherapy treatments.

During this decade—in a joint venture between QIMR, The University of Queensland, a Phase 1 clinical trials facility to test potential new therapeutic products on humans was established.

### 2010s

**Renaming**

In 2013, QIMR received a generous donation of AUD$50.1 million from Toowoomba philanthropist Clive Berghofer AM, OAM. In recognition of his long history of significant support, QIMR was renamed QIMR Berghofer Medical Research Institute.

In 2016, QIMR Berghofer founded GenomiQa to complete human genome sequencing to personalise patient treatments for the individual. Translational research and personalised therapies continue within four distinct programs: Cancer, Mental Health, Infectious Diseases and Chronic Disorders.

The Institute’s status as a leading translational facility was reinforced in 2015 with Q-Gen becoming the first Australian manufacturing facility to receive Therapeutic Goods Administration approval to manufacture cellular therapies for human use.
A new study by QIMR Berghofer and Princess Alexandra Hospital has found a significant increase in the number of Queenslanders being admitted to hospital management of cirrhosis, and the rates are highest among the state’s most disadvantaged.

The researchers examined Queensland Health admissions data from 2008 to 2016, from all public and private hospitals.

Senior author, Professor Patricia Valery, from QIMR Berghofer’s Cancer and Chronic Disease research group said in that period, there was a 62 per cent increase in the number of patients being treated for cirrhosis at Queensland hospitals, from 2701 admissions in 2008 to 4367 in 2016.

‘Hospitalisation rates for cirrhosis increased from 8.5 per 10 000 people to 11 per 10 000 people, were 2.5-fold higher among men, and peaked in men aged 55 to 59 years,’ Professor Valery said.

‘The rate of admission with cirrhosis was 3.4 times higher for Indigenous patients than the rest of the population.

‘The overall in-hospital deaths from cirrhosis-related admissions to hospitals was 9.7 per cent for males and 9.3 per cent for females. The good news is that the rate of in-hospital death has decreased during the study period, particularly in men.

‘The concern is that most people in the community who are affected by liver disease aren’t even aware that they have it. By the time they’ve developed the symptoms, their liver damage has often advanced to a stage where it’s irreversible.’

Implications for Queenslanders and health care providers

Lead researcher and Princess Alexandra Hospital Hepatologist, Professor Elizabeth Powell, said the study found alcohol misuse was a contributing factor in 55 per cent of cirrhosis admissions, and socioeconomic disadvantage was a contributing factor in 27 per cent of cases.

‘The concern is most people in the community aren’t even aware that they have liver disease.’

- Professor Patricia Valery

‘About one in four of all cirrhosis admissions to Queensland hospitals were from patients residing in the most socioeconomically disadvantaged areas of the state, compared to one in five for all hospital admissions in Australia,’ Professor Powell said.

‘Many patients admitted to hospital with serious complications of cirrhosis, such as severe jaundice and confusion, may not live for more than two years without a liver transplant.’

‘There are many triggers for the disease, including excessive alcohol use, hepatitis B and C, or if people have fatty liver disease, which is usually a consequence of obesity.’

Professor Valery said the study findings had implications for Queenslanders and health care providers.
Early screening is helping save lives: First-hand patient account

Queensland man Steve, 59, has been managing his cirrhosis since he was diagnosed with the disease when he turned 50, and believes early screening helped save his life.

‘It was picked up when doctors screened my liver in 2010 when treating me for Hepatitis C,’ Steve said.

‘I’m not sure how I contracted Hepatitis C. It may have been the result of the way I partied as a young adult in the 1970s or when I had surgery in my 20s, but it led to cirrhosis.

‘They discovered I had a tumour on my liver, which was the result of cirrhosis, but because it was caught early the cancer was taken out and I have made a full recovery.

‘So many people I know, around my age, have cirrhosis or have died from liver cancer.

‘The worst thing about chronic liver disease is that it is a silent killer! You can develop tumours and not know, and that’s why it’s so important to have a good GP who will keep an eye out for cirrhosis.

‘People around my age and younger should also ask their GPs if they think they should be tested for liver disease. It’s better to find out you’ve dodged a bullet or get treated early than find out too late.’

- Steve, liver disease patient, age 59

‘The worst thing about chronic liver disease is that it is a silent killer! You can develop tumours and not know, and that’s why it’s so important to have a good GP who will keep an eye out for cirrhosis.’

- Steve, liver disease patient, age 59

Professor Patricia Valery
Team Head, Cancer and Chronic Disease Group at QIMR Berghofer
Parkinson’s disease is a progressive neurodegenerative disorder affecting 1 in 350 Australians - it is the second most common disorder, second only to Alzheimer’s disease. Symptoms of Parkinson’s disease can include tremor, stiffness and slowness of movement, but psychiatric problems are also commonly observed.

Parkinson’s disease is caused by the loss of cells deep within the brain that produce a neurotransmitter called dopamine. Degeneration of these neurons impairs the transmission of signals within the brain, affecting a person’s ability to control their muscles.

QIMR Berghofer lead researcher and St Andrews Hospital neuropsychiatrist, Dr Phil Mosley, said the medications used to treat the condition increase dopamine levels in the brain, which alleviates difficulties with movement but may predispose patients to develop harmful addictive behaviours such as problem gambling, binge eating, hypersexuality and excessive shopping.

One question that scientists and clinicians have been unable to answer is: why do some people develop these addictive behaviours after taking these medications, while others don’t?

To bridge this gap, Dr Mosley and his team recruited a group of 57 people with Parkinson’s disease on dopamine-containing medication, and used brain imaging to study two brain networks thought to be crucial for decision-making: a network for choosing the best course of action and a network for stopping inappropriate actions. These networks connect regions of the brain within the frontal lobes, an area known to support higher-order features of personality.

Alongside the brain imaging, researchers created a virtual casino for study participants to probe these reward and risk structures in the brains of people with Parkinson’s disease.

‘We used an advanced method of brain imaging, called diffusion MRI, to reconstruct the connections between different regions of the brain involved in these decision-making circuits,’ Dr Mosley said.

‘We then asked our participants to gamble in a virtual casino, which gave us a readout of impulsive and risk-taking behaviour in real time.

‘We measured their vulnerability to addictive behaviours through their tendency to place high bets, switch between poker machines and accept “double or nothing” gambles,’ he said.

With regards to addictive behaviours, 17 of the 57 participants developed these problems during clinical follow up.

‘Crucially, this method of combining information from brain imaging and virtual gameplay allowed us to distinguish these people with addictive behaviours, which has not previously been possible based on clinical evaluation alone. This could have significant implications for clinical practice, by allowing us to take proactive steps to limit the damage caused by addiction in those with greatest vulnerability,’ he said.
An Australian and Taiwanese collaboration has for the first time pinpointed where in the brain the communication process breaks down for people with chronic attention deficit hyperactivity disorder (ADHD) — a finding that could change the way people with the disorder are treated in the future.

ADHD Australia estimates 1 in 20 Australians have the disorder, with symptoms including inattention, distractibility, hyperactivity and impulsivity.

ADHD is the most common mental disorder affecting children and adolescents, and can have huge implications if the children struggle with school. The development of new therapies can have lifelong consequences for these children. Bringing the symptoms under control will allow people with the disorder to better manage schooling.

Lead researcher and head of the Clinical Brain Networks team at QIMR Berghofer Medical Research Institute, Associate Professor Luca Cocchi, said the study found ADHD symptoms are linked to noisy communication between brain regions in individuals with the disorder.

‘Our results suggest that elevated noise in the signal between sensory and cognitive regions of the brain are related to people having trouble maintaining their attention and controlling their hyperactivity,’ Associate Professor Cocchi said.

‘It’s like when a loudspeaker is not working properly and emits a lot of static, making it harder to understand what is being said.’

Researchers used brain imaging to compare 80 adults diagnosed with ADHD as children, but who had never used medication for the condition, with 120 people of similar intelligence, unaffected by ADHD.

‘We found no major differences in the brain anatomy of people with ADHD, compared to people without the condition, but there was a change in how the anatomical pathways support the communication between the parts of the brain that govern vision, movement and sensory information,’ Associate Professor Cocchi said.

Co-author and senior research officer in QIMR Berghofer’s Brain Modelling team, Dr Paula Sanz-Leon, said they used advanced computer simulations to define the likely cause of the abnormal associations in the brain.

‘Computer simulations and brain imaging showed that the greatest difference between people with and without ADHD was in the coupling between the peripheral sensory regions of the brain and their processing hubs,’ Dr Sanz-Leon said.

‘This would explain why the neural pathways in people with ADHD do not work as effectively and result in erratic messaging.’

Associate Professor Cocchi said this study provides important new clues for future research into treatments for this debilitating disorder.

‘Understanding how the communication between remote brain regions is impacted by ADHD could lead to better treatments, including medicines that reduce neuronal noise or by using non-invasive brain stimulation,’ he said.
In an Australian first, Queensland researchers have released Genomic Partnerships — a set of guidelines to help genomic health researchers work with Aboriginal and Torres Strait Islander communities in a way that respects cultural protocols.

The genomics research guidelines were developed by researchers at QIMR Berghofer Medical Research Institute working in partnership with Aboriginal and Torres Strait Islander communities across Queensland, with funding from Queensland Health’s $25 million health genomics investment program: Queensland Genomics.

QIMR Berghofer established a specific multidisciplinary team – led by Greg Pratt, who is an Indigenous man, descendant of the Quandamooka Nation, Noonucal Tribe – dedicated to working with Aboriginal and Torres Strait Islander communities to ensure those communities benefit from health research.

‘We developed Genomic Partnerships to help researchers undertaking genomic research in collaboration with Aboriginal and/or Torres Strait Islander Queenslanders,’ Greg Pratt said.

‘Genomic Partnerships was informed by a series of consultations and engagement with stakeholders and community members across Queensland.’

The guideline, launched electronically, has received approximately 400 downloads in the first three months.

The guideline has attracted international interest, with Greg recently sharing the guidelines at the American Society of Human Genetics in Houston, Texas, USA and the World Indigenous Cancer Conference 2019 held in Calgary, Alberta, Canada.

Closer to home, the guideline generated discussion at the Genomics in Australian healthcare: foundations to future national conference in Melbourne and the Indigenous Public Forum held at QIMR Berghofer.


Aboriginal and Torres Strait Islander people to share the benefits of genomic medicine
Through the work of our dedicated scientists and their life saving medical research, QIMR Berghofer has become a symbol of hope for Queenslanders and people around the world.

Every day, over 600 scientists and support staff at QIMR Berghofer undertake research in more than 60 specialised laboratories, but the reality is they can’t do it without the backing of a generous and supportive community.

Each year, at the annual QIMR Berghofer Awards, the Institute recognises several individuals who have made outstanding contributions to the Institute and within their communities to keep this hope alive.

In December 2019, Council Chair Distinguished Professor Arun Sharma presented Clive Berghofer Humanitarian Awards to three well-deserving recipients: Lorraine Duckwitz, Barbara McKay and Robyn Britton.

Lorraine Duckwitz was recognised for two decades of tireless work as a QIMR Berghofer Ambassador, promoting and raising money for the Institute through her sent auctions and always in memory of friends.

Barbara McKay was recognised for the outstanding support she and her late husband and family have provided to the Institute over the last 23 years, including funding for mesothelioma research and a PhD scholarship.

Robyn Britton was recognised for her wonderful philanthropic support for QIMR Berghofer’s cancer research program and a number of cancer-related charities through the LE Wilkins Foundation.

Congratulations and thanks to Lorraine, Barbara and Robyn for their unique contributions to the Institute over the years, and to all our community fundraisers and ambassadors, who work tirelessly alongside our researchers to ensure a healthier and hopeful future for all.
Corporate partners, the Skin Cancer Institute, recently visited QIMR Berghofer to learn more from our researchers about vital skin cancer research that is saving lives.

During the event, QIMR Berghofer’s Acting Director and CEO Professor David Whiteman AM was delighted to accept a cheque for $14 000, presented by the Founder of the Skin Cancer Institute, Paul Elmslie.

In 2015, Paul Elmslie, CEO and Founder of HealthCert, established the Skin Cancer Institute, a not-for-profit organisation dedicated to reducing unnecessary deaths from skin cancer by improving the availability and delivery of best-practice diagnosis and treatment.

The vision of the Skin Cancer Institute is to achieve ‘a world where no one dies of skin cancer’.

‘I wanted to create a truly global community, for both medical and non-medical professionals, that are passionate about skin cancer medicine,’ Mr Elmslie said.

‘While HealthCert is dedicated to saving lives and improving patient outcomes through primary care education, the Skin Cancer Institute is bigger than this.

‘Our aim is that Skin Cancer Institute will lead the way in promoting standards for skin cancer diagnosis and treatment, provide a platform to recognise skin cancer doctors, who have undertaken additional training to ensure best-practice skin cancer services, provide education materials to members and, perhaps most importantly, it will support important research in the area of skin cancer prevention, diagnosis and treatment.’

In Australia, at least 2 in 3 Australians will be diagnosed with skin cancer by the age of 70 and the number of skin cancer cases outnumbers the number of all other types of cancers combined.

Renowned for being a world-leader in skin cancer research, QIMR Berghofer is pleased to be partnering with the Skin Cancer Institute, to advance further understanding of skin cancer genetics, risk, diagnoses, prevention and treatment of this silent killer.

Thank you to the members of the Skin Cancer Institute for their generous contribution and ongoing support of QIMR Berghofer’s skin cancer research programs.
Donor Appreciation Morning Tea

We have welcomed some of our most generous supporters to the Institute in the last few months.

We celebrated the generosity of those people in our community who made significant contributions at our annual Donor Appreciation Morning Tea, hosted by renowned Australian poet Rupert McCall.

Guests were invited to place their plaque on the Wall of Appreciation, and received talks from our scientists, including ‘Unlocking the mysteries of dementia’ by Associate Professor Anthony White, and ‘The impact of philanthropy on the future of research’ by Rina Kumar, PhD candidate.

Once again, thank you for your generous support in 2018-2019. Your contribution to medical research is helping to ensure a happier and healthier future for generations to come.

Bancroft Society November 2019

Our vital supporters, known as The Bancroft Society, also came together at the Institute, in recognition of their decision to leave a gift in their will to QIMR Berghofer.

The Society members were treated to presentations from leading scientists — Associate Professor Severine Navarro and new Head of the Mental Health Program, Associate Professor James Scott.

Our scientists and staff certainly enjoyed meeting you all, and we hope to see you next time.