The Best of 2017
Research Highlights

Can we reduce our risk of dying from cancer?

New hope for drug-resistant epilepsy
A Note from the Director

What a year! 2017 has been a year of impressive achievements for QIMR Berghofer. We have continued to push the boundaries of scientific knowledge through discovery research, while also ensuring it leads to translational research that will produce new diagnostics and treatments to improve, prolong and save lives.

Although Australia’s per capita melanoma rates are now falling, Queensland still carries the unenviable title of being home to the world’s highest rates of this potentially deadly disease. In 2016—2017, our researchers led a landmark global study which confirmed that two rarer subtypes of melanoma are not caused by sun exposure. This finding opens the way for our researchers to look for more targeted treatments for those melanomas and is part of our engagement in what is now referred to as precision medicine.

Our population health researchers found that breastfeeding is associated with a lower risk of developing uterine cancer, and provided the best evidence to date of a link between smoking and the common skin cancer, squamous cell carcinoma. These, and many more research success stories from the year, are noted in the 2017 Research Highlights section of this issue of LifeLab.

Your generous support of medical research has greatly contributed to our exciting progress in 2017.

From everyone at QIMR Berghofer, thank you!

Professor Frank Gannon
Director and CEO

THANK YOU!

Thank you to all our wonderful donors who sent in heartfelt and motivational messages for the new year to our scientists.

We proudly displayed your messages on our tree in our reception area for guests and scientists to read and enjoy. Thank you for your support in 2017!

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**The Best of 2017**

**Research Highlights**

**POTENTIAL NEW HOPE FOR ASTHMA SUFFERERS**
We created fresh hope for asthma sufferers who experience an attack brought on by the common cold. An antibody was tested in pre-clinical trials with researchers from QIMR Berghofer and the University of Queensland, which revealed it may help the body to fight colds, while potentially reducing the risk of an asthma attack.

**DISCOVERED 72 NEW GENE MARKERS FOR BREAST CANCER**
We led the world’s biggest ever genetic study of breast cancer and discovered 72 new genetic variants that put women at higher risk of the disease. Our hope in the future is that we will be able to test for these genetic variants in order to inform preventative approaches and treatment for women who may be at a higher risk of breast cancer.

**COMPLETED WORLD’S LARGEST STUDY OF ALLERGIC DISEASE**
QIMR Berghofer scientists conducted the world’s largest genetic study of allergic disease, which examined the DNA of 360,000 individuals and identified over 100 genetic risk factors that explain why some people suffer from asthma, hay fever and eczema. The research determined which specific genes, when not working properly, cause allergic conditions, giving us new clues on how allergies could be prevented or treated.
DEVELOPING GROUNDBREAKING DIAGNOSTIC & TREATMENT TOOLS FOR DRUG-RESISTANT EPILEPSY

Researchers at QIMR Berghofer, Mater Centre for Neurosciences and Queensland University of Technology joined forces to develop new diagnostic and treatment tools for doctors working with patients who have drug-resistant epilepsy. The head of QIMR Berghofer’s Mental Health Program, Professor Michael Breakspear, said the team will use world-leading diagnostic imaging techniques to improve treatment of epilepsy through brain stimulation, improving health outcomes for patients, with fewer negative side-effects.

TAKING A PROACTIVE APPROACH TO REDUCE FUTURE RISK OF DENGUE MOSQUITO

Our researchers warned the growing popularity of rainwater tanks on Brisbane properties could provide the right conditions for the dengue mosquito *Aedes aegypti* to return to the city, almost 60 years after its elimination. The global emergence and re-emergence of mosquito-borne viruses, including dengue, chikungunya and Zika virus, highlighted the importance of early detection and response to disease-carrying mosquitos in urban areas.

NEW GENE HOPE FOR PATIENTS WITH AGGRESSIVE BREAST CANCER

We have discovered a set of genes that can help predict the survival of breast cancer patients. The findings could in the future help us test patients to determine who is likely to experience a relapse and need further treatment. As well as a diagnostic tool, this research also helps us develop new drug targets for aggressive breast cancer.
LINKED BREASTFEEDING TO A LOWER RISK OF UTERINE CANCER

An international study led by QIMR Berghofer has found that women who have breastfed at least one child have a lower risk of cancer of the uterus. The study was the largest and most comprehensive analysis of the link between breastfeeding and uterine cancer.

ZIKA VIRUS BREAKTHROUGH

Our researchers synthetically re-created Zika virus in the laboratory, a breakthrough that will help scientists to understand the virus and the foetal brain defects it causes. The research was a collaboration between QIMR Berghofer and UQ’s School of Chemistry and Molecular Biosciences.

FOUND THE LINK BETWEEN SMOKING AND SKIN CANCER

We have found the strongest evidence yet of a link between smoking and a common form of skin cancer. The team from QIMR Berghofer studied nearly 19,000 people and found that current smokers were significantly more likely than non-smokers to develop a squamous cell carcinoma (SCC) of the skin.

PROGRESS TOWARDS ERADICATING MALARIA

Our scientists, as part of an international team, sequenced the genomes of the final two species of malaria parasites. The findings have important implications for malaria eradication worldwide and may help researchers to develop new drugs and a vaccine. Malaria kills about 500,000 people, mostly children, each year. 

Breastfed two babies for 9 months
Risk dropped by 22%

World-leading immunologist, Professor Rajiv Khanna, was appointed an Officer of the Order of Australia in the 2017 Queen’s Birthday Honours list.
In 2017, QIMR Berghofer hosted more than 100 visiting scientists, affiliates and honorary/emeritus appointees.

In 2017, QIMR Berghofer collaborated with international researchers on more than 60 per cent of the Institute’s publications.

**PAVED THE WAY FOR A NEW TREATMENT FOR DEADLY GVHD.**

Our scientists have unlocked the secrets of a little-understood immune cell, potentially paving the way for an easier way to treat and prevent graft-versus-host disease (GVHD). GVHD occurs in up to 70 per cent of patients who receive a stem cell transplant to treat blood cancer. A significant proportion of patients who develop acute GVHD of the gastrointestinal tract do not survive. We hope that by giving patients infusions of these cells early on, we will eventually be able to prevent GVHD altogether.

**IDENTIFIED 12 NEW GENETIC CAUSES OF OVARIAN CANCER**

As part of a major international collaboration, we identified 12 new genetic variants that increase a woman’s risk of developing epithelial ovarian cancer. Only 44 per cent of women who are diagnosed with ovarian cancer will survive for five years. Our hope in the future is that further study may help us to treat and even prevent ovarian cancer.

**REVEALED UNDERLYING GENETIC LINKS OF NEUROENDOCRINE PANCREATIC CANCER**

Our researchers played a key role in an international research effort that revealed that genetic changes normally linked to breast, colon and ovarian cancers could also drive a rare form of pancreatic cancer, pancreatic neuroendocrine tumours (PanNETs). The findings offer the prospect of one day being able to identify people at risk of these cancers, as well as aggressive forms of the disease, and who might respond to current or new targeted therapies.
IMR Berghofer is inspiring the next generation of medical researchers through our high school education programs. These programs give students from across the entire state the chance not only to engage with QIMR Berghofer scientists on the vital work they do, but to gain hands-on, practical experience of what it’s like to work in a medical research laboratory.

The education program’s flagship initiative is our ‘Day in the Life of a Scientist’ program, which offers classes of Year 11 or Year 12 students the opportunity to gain hands-on experience through a number of practical activities in the education lab that relate directly to the work performed by our scientists. These practical classes include examining the links between the drug discovery process and disease, examining genetic material for inheritability, as well as investigating the links between the immune system and vaccines.

For students with a particularly keen interest in medical research as a potential career pathway, we also offer the opportunity to participate in a three-day work experience program where they are given hands-on training in our purpose-built education lab, followed by placement in a research lab. Practical training is not limited to students, but also offered to high school teachers through a number of professional development workshops.

We also engage high school students through our lecture series. These lectures include presentations from some of QIMR Berghofer’s top research scientists. The lecture series is run in-house at the Institute, and is also taken on the road to a number of regional centres around Queensland.

If you know any high school students or teachers who would like to learn about the outstanding science at QIMR Berghofer, direct them to the student section of our website and we can work through the best program to suit their needs.

Visit: qimrberghofer.edu.au/students
TOURS

QIMR Berghofer is proud to offer a free tour program for community groups. If you belong to a community group, why not take the opportunity to put our research under the microscope in 2018? Tours include a formal presentation, morning tea and the opportunity to see inside one of our laboratories.

'The most interesting tour I’ve ever been on!
Chermside Diabetes Support Group

To make a booking or find out more information, contact us on 1800 993 000 or email: enquiries@qimrberghofer.edu.au

WHAT’S ON

Tiny Worlds - Ipswich

QIMR Berghofer has the pleasure of exhibiting a series of our microscopic images and illustrations at the Workshops Rail Museum in Ipswich from 3 February 2018 until the end of June 2018. Come and experience the exhibition and see where the worlds of art and science meet!

World Science Festival Brisbane

As an official program partner of the World Science Festival Brisbane, QIMR Berghofer Medical Research Institute invites you to be inspired at the many exciting events held in Brisbane and regional Queensland.

538
students and 35 teachers attended a lecture series specifically for high school kids, presented by some of the Institute’s top scientists.

6
teachers undertook professional development in the education lab.
Most Queenslanders know that avoiding sugar-laden food and getting regular exercise is good for their health. But what if scientists could quantify the actual health benefit to be derived by the average person depending on potentially modifiable lifestyle factors, or their environment?

A new study by researchers at QIMR Berghofer has done just that, finding a sobering 38 per cent of cancer deaths in Australia each year are potentially preventable.

‘Cancer is the biggest cause of death in Australia,’ says QIMR Berghofer’s Deputy Director and head of the Cancer Control Group, Professor David Whiteman.

‘It claimed more than 44 000 lives in 2013 and caused untold grief and heartache to many more.

‘And while in many cases, cancer is tragically unavoidable, this study highlights what we’ve known for some time: cancer isn’t always a matter of genetics or bad luck.’

Scientists found about 16 700 deaths from cancer each year could potentially be avoided, the vast majority through lifestyle changes.

The study sourced cancer incidence and mortality data from the Australian Institute of Health and Welfare and the Australian Bureau of Statistics, with researchers calculating the risk of cancer dependent on exposure to one or more of eight modifiable factors.

‘By far the biggest preventable cause of cancer deaths in Australia is tobacco smoke,’ says Professor Whiteman.

‘Cancer caused by smoking and passive smoking killed 9921 people in 2013 and accounted for 23 per cent of all cancer deaths.’

Aside from both smoking and passive smoking, other factors that heightened the risk of cancer were a poor diet – low fruit, vegetable and fibre intake or eating too much red or processed meat – and drinking too much alcohol.

Scientists found being overweight or obese, not doing enough exercise and too much sun exposure all contributed significantly to the burden of cancer.

Infections like Hepatitis C and Human papillomavirus, and hormone therapies, such as menopausal hormone therapy, were also linked to an increased risk of cancer.

‘The other major factors were poor diet, being overweight or obese, and infections. Each of those factors was directly responsible for about five per cent of all cancer deaths in 2013,’ Professor Whiteman said.

‘Poor diet caused 2329 deaths from cancer, being overweight or obese 1990 deaths, and infections 1981 deaths.

‘In line with these findings, the cancers responsible for the largest numbers of potentially preventable deaths were lung, bowel, cutaneous or skin melanoma, liver, and stomach cancers.’

Professor Whiteman said the eight modifiable factors were responsible for 41 per cent of cancer deaths among Australian men and 34 per cent of cancer deaths in women.

‘The proportions of potentially preventable cancer deaths were higher among men than women because, on average, men smoke and drink more, spend more time in the sun, and don’t eat as well as women,’ he adds.

But Professor Whiteman said there was good news to be taken from the findings.
'This study shows that in theory, about 17 000 cancer deaths could be prevented each year if people followed accepted guidelines to minimise their exposure to risk factors,' he said.

'There is a lot people can do to reduce their risk of developing and dying from cancer.'

Professor Whiteman said smokers should try to quit, while regular exercise was a big plus.

'If you currently smoke, seek advice on how to quit,' he says.

He said most Australians weren’t getting enough daily exercise.

'Start introducing some simple physical activity into your routine and aim to maintain a healthy body weight,' he said.

'Finally, always remember to protect yourself from the sun.

'Even small improvements in these areas would substantially reduce the number of people who die prematurely from cancer each year.'
The growing popularity of rainwater tanks on Brisbane properties could provide the right conditions for the dengue mosquito *Aedes aegypti* to return to the city, almost 60 years after its elimination. Although endemic to North Queensland and found as far south as Gin Gin and Goomeri, neither the mosquito nor its larvae has been found in Brisbane – outside first ports of entry or quarantined facilities – since 1957.

Scientists from QIMR Berghofer have trawled through historical data to catalogue the role of state and council-imposed mosquito regulations, and a decline in the use of rainwater tanks until very recently, on the public health fight against dengue in the city. Dr Jonathan Darbro said the last recorded case of locally acquired dengue fever in Brisbane was in 1948. He said the *Aedes aegypti* mosquito, which transmits dengue, likely became extinct in Brisbane around 1960.

'Dengue and the *Aedes aegypti* mosquito were once prolific in Brisbane and even further south in New South Wales,' Dr Darbro said. 'We know this because our early historical records document outbreaks as early as 1887, although it wasn’t until 1906 that a Brisbane scientist, Thomas Bancroft, first suggested that particular mosquito was the vector,' he said.

According to Dr Darbro, deaths due to dengue peaked in Brisbane during 1905 but the last outbreak wasn’t until 1943, which resulted in 646 cases. Without a reliable source of drinking water until the commissioning of the Somerset Dam in 1954, households in Brisbane relied on rainwater tanks for potable water. Unfortunately, rainwater tanks were also the ideal environment for the dengue mosquito to breed in. Authorities introduced anti-mosquito regulations in 1911, which allowed them to fine and prosecute residents who owned rainwater tanks that harboured mosquito larvae.

PhD student Brendan Trewin said rainwater tanks provided the perfect refuge for dengue mosquitoes during the dry season, as well as protection from the cold during winter.

'Following the introduction of Somerset Dam to supply Brisbane’s water in 1954, the number of rainwater tanks used by households fell dramatically,' he said.

Mr Trewin said improved living conditions and infrastructure in Brisbane following World War II, the isolated use of chemicals like DDT, and making households directly responsible for compliance, contributed to eliminating dengue mosquitoes from Brisbane. However, rainwater tanks have grown in popularity in Queensland in recent years.

'By 1971, there were fewer rainwater tanks relied on by households and those that did exist were more likely to be compliant with anti-mosquito regulations and less likely to harbour the vector.'

With the current distribution of *Aedes aegypti* just 170km north of Brisbane, it’s vital we use our understanding of past threats to inform ongoing mosquito surveillance and rainwater tank monitoring,' Dr Darbro said.

Mr Trewin said the global emergence and re-emergence of mosquito-borne viruses including dengue, chikungunya and Zika virus, highlighted the importance of early detection and response to disease-carrying mosquitoes in urban areas.
NEW HOPE FOR DRUG-RESISTANT EPILEPSY

Researchers at QIMR Berghofer Medical Research Institute, Mater Centre for Neurosciences and the Queensland University of Technology will join forces to develop new diagnostic and treatment tools for doctors working with patients who have debilitating, drug-resistant epilepsy.

QIMR Berghofer project leader Professor Michael Breakspear said the team will use world-leading diagnostic imaging techniques to improve treatment of epilepsy through brain stimulation. 'We are building on the latest research in neurology and systems neuroscience and taking it straight to the hospital bedside where it can help people with epilepsy in Queensland,' he said.

'Our work will secure improved health outcomes for patients and make it easier for doctors to diagnose and treat chronic seizures, with fewer negative side-effects.'

The Mater’s Dr Sasha Dionisio said practical requirements at the Advanced Epilepsy Unit will drive the project, ensuring the effective translation of cutting-edge research to clinical practice.

'A clearer picture of the seizure process will allow doctors to undertake interventions that are smaller scale and more targeted, which can mean more effective treatment with less impairment of function post-surgery,' Associate Professor Johnston said.

'We hope to be in a position to progress clinical trials at the end of the three-year partnership period.'

Professor Breakspear said it was his hope that successful completion of the project targeting epilepsy would open up the door to more effective treatment of other neurological and even psychiatric disorders, such as Parkinson’s disease, major depression and dementia.

The partnership builds on the ongoing work of Professor Breakspear and Dr Christine Guo, funded through a Clinical Collaboration award at QIMR Berghofer, and uses the cutting-edge Herston Imaging Research Facility (HIRF).

'When determining the progression of a patient’s epileptic seizures, doctors must take into account brain information acquired through multiple imaging, neurophysiology and observational processes,' he said. 'There are currently no dedicated tools available to support this vital decision-making process. That’s why we will develop new software to build a network view that makes it easier for neurologists to see different types of brain activity at the one time.

'We will also develop clinical procedures and software that maps the strength of connections in the brains of epilepsy patients, measured by giving them electrical pulses. Our goal is to make this procedure practical to deploy in more hospitals.'

QUT’s Associate Professor Patrick Johnston said the team will pilot new methods of stimulating the brain to enhance decision making before surgery and improve treatment.

‘Translating and commercialising this technology for clinical practice is a game-changer for Queensland and will build our medical diagnostic and medical device industry capabilities.’

Professor Michael Breakspear

It is supported by $1.5 million from the Queensland Government as part of its $15 million Advance Queensland Innovation Partnerships Program.
What is your area of research?

My research aims to identify the genetic events driving the growth of melanoma and to use this information to inform or improve treatment strategies for patients with late-stage, or metastatic, disease.

Can you tell us about a project you’re working on at the moment?

We’ve recently discovered an interesting correlation that might explain why metastatic melanoma patients whose tumours have mutations in a gene called PTEN are difficult to treat. As this mutation occurs in about 15 to 20 per cent of patients, we are excited about this as we have also shown that a new class of drugs, called AKT inhibitors, is effective in slowing the growth of these cancers.

How did you end up in science?

During high school, I enrolled in a class called ‘Diseases and Drugs’ and was fascinated by how simple changes in a person’s genetic code could have profound outcomes for human health. Not surprisingly, this scientific curiosity fuelled my research career in exploring the interconnection of genetics and cancer.

You spent time overseas doing research at Boston MIT. What did you get out of your experience there?

Having the opportunity to do research in Boston at one of the world’s leading cancer institutes was a formative experience for me, both personally and scientifically. Not only did I expand my collaborative network and learn new techniques, it also made me appreciate the high quality of research being performed here at QIMR Berghofer and in Australia.

What made you decide to come back to Australia to continue your scientific career?

In 2014, I was fortunate to receive a NHMRC Early Career Fellowship that funded my salary for two years overseas and as such, I always considered myself ‘on-loan’. However, the real story is that my wife and I were ready to start a family and we wanted to do that back home in Australia.

What do you like about working at QIMR Berghofer?

There’s a vibrant community feel at QIMR Berghofer, and a collegiality between all employees that stretches from the researchers, to the support staff, to the leadership team. Beyond that, I think there are a wealth of opportunities to develop scientifically and professionally, and I will always be grateful for the time I have spent here (which is almost 10 years now).

You recently received a Queensland Young Tall Poppy Science award. Was that a career highlight?

It meant a lot to me as I had been working towards this award for more than five years. I’m really passionate about science communication and am always talking to the community about the benefits and importance of medical research. It was great to be recognised by the Office of the Chief Scientist of Queensland for my research and science communication efforts.

What do you hope to have achieved by the time you retire?

As funny as this sounds, I’d be ecstatic if I had to retire early because we had succeeded in making late-stage melanoma a chronic disease with high survival rates. Notably, we’ve gone from a three-year survival rate of 20 per cent up to 60 per cent in the last five years alone…. maybe I’ll need to think about retirement plans sooner rather than later.

When you have a couple of hours free, how do you pass the time?

Trying to juggle an eight-month-old son with all the demands of becoming an independent researcher means that ‘a couple of free hours’ feels like a luxury I don’t have at this stage of my life. Despite that, I try my best to keep active by running and cycling (triathlon is on hold) and spending as much time with my favourite people, Kate and Ty (my wife and son).
NOTHING TO SNEEZE AT

How unlocking genetic risk factors could be the path to an allergy-free existence

It starts as a tickle.

It gains momentum with a sniff.

Before long, there’s an itch, watery eyes, a runny nose and a full-body sneeze.

It sounds innocuous enough, but for nearly one in five Australians who suffer from hay fever, there’s little relief. Now scientists from QIMR Berghofer have pinpointed more than 100 genetic risk factors that explain why some people are more prone to not only hay fever, but asthma and eczema, too.

‘Asthma, hay fever and eczema are allergic diseases that affect different parts of the body: the lungs, the nose and the skin,’ says QIMR Berghofer’s Dr Manuel Ferreira.

‘We already knew the three diseases shared many genetic risk factors. What we didn’t know was exactly where in the genome those shared genetic risk factors were located. This is important to know because it tells us which specific genes, when not working properly, cause allergic conditions. This knowledge helps us to understand why allergies develop in the first place and, potentially, gives us new clues on how they could be prevented or treated.’

Dr Ferreira collaborated with researchers from Australia, Germany, the Netherlands, Norway, Sweden, the UK and the US on the major international study, which analysed the genomes of 360 838 people and identified 136 locations that heighten the risk of developing one or all of the common allergies.

‘We think the 136 genetic risk factors we found may influence whether 132 nearby genes were switched on or off, ultimately affecting how the cells of the immune system work. However, what is most exciting is that we have identified several drugs that we believe could be targeted at some of these genes to treat allergies. The next step would be to test those drugs in the laboratory,’ he said.

Dr Ferreira said the research also found that environmental factors might affect whether certain genes may be switched on or off.

‘If you are unlucky and inherit these genetic risk factors from your parents, it will predispose you to all three. It doesn’t mean you’ll get all three, but you are at higher risk of all three.’

‘For example, we found one gene – called PITPNM2 – that is more likely to be switched off in people who smoke. If this gene is switched off, then the risk of developing allergies increases,’ he said.

Edison Flynn, 4, has suffered with all three allergies since he was a baby and now uses an inhaler to manage his asthma and topical creams for his eczema.

His mother, Madeleine Flynn, said she was excited by the potential for new drugs to treat the conditions.

‘When he was a baby, it was very, very stressful to deal with eczema and asthma, especially when he was so little,’ she said.

According to the Australian Bureau of Statistics, around 11 per cent of all Australians, or 2.5 million people, reported having asthma in 2014—15.
Josie Dietrich should have been enjoying the thrills of new motherhood. Instead, at 35 and just four years after her mother’s death from breast cancer at 56, she was thrust into the fight of her life.

When her son Felix was just eight months old, Ms Dietrich was diagnosed with breast cancer following a routine screening in 2009.

In the months and years afterwards, she underwent chemotherapy, had nine lymph nodes removed and a double mastectomy and reconstruction. Then her womb, ovaries and cervix were removed, leaving her unable to have any more children.

The new discovery by researchers from QIMR Berghofer of 72 previously unknown genetic markers for breast cancer may have given Ms Dietrich a clearer picture of her risk of breast cancer following the death of her mother.

‘If there was a test that I could have taken back then, I would have done it,’ she said.

QIMR Berghofer’s Professor Georgia Chenevix-Trench, one of the leaders of the international collaboration behind the discovery, said combined with existing knowledge, the research could one day help in the development of a predictive test for breast cancer.

She said a greater understanding of a woman’s risk of developing breast cancer may help to change the age at which a woman is offered mammogram screening and how often.

‘Many women are offered mammogram screening when they are middle-aged, but if we know a woman has genetic markers that place her at higher risk of breast cancer, we can recommend more intensive screening at a younger age,’ she said.

Professor Chenevix-Trench said the study found 65 genetic variants that predisposed women to overall risk of breast cancer, and a further seven variants that put a woman at higher risk of oestrogen-receptor negative breast cancer, which doesn’t respond to drugs like tamoxifen.
The discovery was made possible through collaboration between the Breast Cancer Association Consortium (BCAC) and the Consortium of Investigators of Modifiers of BRCA1/2, which is led by Professor Chenevix-Trench.

Professor Chenevix-Trench, senior researcher Dr Jonathan Beesley, functional cancer genomics specialists Associate Professor Stacey Edwards and Associate Professor Juliet French, collaborated with researchers from more than 300 institutions across the world to make the discovery.

Ms Dietrich, now aged 43, is determined to turn her battle against breast cancer into a positive. A memoir chronicling her journey, *In Danger*, is due to be published by UQP in April.

**Prevention & Genetic Risk**

**Our Research Goal**

By identifying the genetic risk of developing breast cancer we can aid preventative surveillance and/or preventative intervention before cancer has a chance to develop.

**Prognosis & Initial Treatment**

**Our Research Goal**

By developing new diagnostic tests that can help with personalised treatment and predictors of disease progression, we can create better survival outcomes and reduce chances of relapse.

**Advanced Stage Treatment**

**Our Research Goal**

Survival from metastatic disease is poor. By developing targeted drug therapies we can help increase survival rates from advanced stage cancer and metastatic disease.

**Survivorship**

**Our Research Goal**

By integrating physical activity and weight control as national standards in cancer care we can help reduce the side effects of treatments and improve overall quality of life.

You can help QIMR Berghofer’s passionate team of researchers solve the puzzle of breast cancer for future generations by making a gift today.

100% of donations go directly towards research.

**Ways to donate:**

- Online: qimrberghofer.edu.au/donatenow
- Telephone: 1800 993 000
- Mail: QIMR Berghofer, Locked Bag 2000, Royal Brisbane Hospital QLD 4029

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‘We know that breast cancer is caused by complex interactions between these genetic variants and our environment, but these newly discovered markers bring the number of known variants associated with breast cancer to around 180.’

Professor Georgia Chenevix-Trench

The Breast Cancer Association Consortium (BCAC) is an international collaboration that was established to provide large sample sizes for examining genetic associations. In the past, sample collections were limited to what might be available from local hospitals.

To achieve the statistical power required to uncover true discoveries, the model for investigating diseases like cancer, diabetes and inflammatory bowel disease is to ‘join forces’ with other groups around the world.

Now the BCAC has a collection of 230 000 blood samples from women who’ve had breast cancer, and from unaffected women. Technology that was introduced just over 10 years ago has made it possible to easily compare the DNA from these blood samples from the two groups of women.

Using this large breast cancer collection, we have started to find many of these differences that show a skew towards the breast cancer group. We have found 72 previously unknown genetic markers for breast cancer using this comparison.

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*Breast Cancer Appeal*

Many dedicated and passionate people at QIMR Berghofer work together across different research disciplines to tackle the breast cancer puzzle from all sides, from research into risk and prevention, initial diagnosis and treatment, secondary or advanced treatment, and survivorship.

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**WHAT IS THE BCAC?**

The Breast Cancer Association Consortium (BCAC) is an international collaboration that was established to provide large sample sizes for examining genetic associations. In the past, sample collections were limited to what might be available from local hospitals.

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Using this large breast cancer collection, we have started to find many of these differences that show a skew towards the breast cancer group. We have found 72 previously unknown genetic markers for breast cancer using this comparison.
The water gushed and swirled around them as they quickly realised their mistake.

Just metres from where they were using sheer determination to sluice a heavy bike through the knee-high depths, the rapids cascaded down the falls and into the South American valley below.

A slip would mean losing the bike to the white water, many of their possessions and risk serious injury, even death.

Dylan and Lawson Reid used their body weight to push against the torrent and drive the bike towards the opposite bank, hoping it wouldn’t slide along the flooded roadway and over the edge.

At the rear, Lawson, 32, lost his footing and was shunted on all fours closer to the waterfall’s edge. He scrambled up along the bank and set out a second time into the fierce torrent.

Dylan, 35, stumbled, trudged forward and somehow held the bike upright against the hungry water. The bank couldn’t come fast enough.

With relief, the brothers laughed off another close call on their trip of a lifetime.

Their epic two-and-a-half year journey saw them motorbike through 50 countries and raise more than $81 000 for QIMR Berghofer’s mental health research program. The brothers arrived back home in time for World Mental Health Day on October 10, and celebrated their homecoming at QIMR Berghofer along with a huge crowd of family, friends, staff and supporters.

The journey was inspired by their sister Heidi, who at 27 tragically ended her own life in 2011.

Professor Michael Breakspear, who heads QIMR Berghofer’s Mental Health Research Program, said the money raised would go towards finding an imaging-based diagnostic test for depression.

‘Our world was shattered when we lost Heidi. There was nothing but a bottomless pit of grief... this ride is the one and only positive thing about Heidi’s loss,’ Dylan said.

‘One of the biggest challenges for scientists is getting funding to do the research. I am tremendously grateful to Dylan, Lawson and their parents for supporting this crucial research’, he said.
**GALAS AND GOLF**

The members of McLeod Country Golf Club have, for the second year running, outdone themselves, raising $12,000 for breast and prostate cancer research at QIMR Berghofer.

The weekend of fun, frivolity and fundraising began with a gala dinner and was followed the next day by a champagne breakfast and golf.

To the members and supporters of McLeod Country Golf Club, we salute your sense of fun and thank you for your incredible support!

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**TEEING OFF FOR MEDICAL RESEARCH**

Since 2004, the annual GPT Charity Golf Day has supported QIMR Berghofer. This day brings together representatives from companies all over Brisbane for a day of golf and good times.

This year’s GPT Golf Day had 115 registered players and raised an outstanding $22,500 for research at QIMR Berghofer.

Thank you GPT Charity Golf Day!

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**LAWYERS ON THE RUN**

A team of 30 staff and partners from law firm DibbsBarker’s Brisbane office took part in the annual Bridge to Brisbane charity run on 27 August. The team collectively raised an amazing $10,000 for mental health research at QIMR Berghofer.

While this marks the first time that DibbsBarker has raised funds for the mental health research program, the firm has a proud history of fundraising for cancer research at QIMR Berghofer since 2011.

DibbsBarker, thank you for your ongoing support!

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**FUNDRAISE FOR QIMR BERGHOFER**

Interested in becoming a fundraiser for QIMR Berghofer? Contact QIMR Berghofer Fundraising Officer Natalie Guardala at supportus@qimrberghofer.edu.au or call 1800 993 000 to discuss ideas and opportunities.

You can also get your workplace on board to invest in the future of health.

Thank you to all of our amazing fundraisers for supporting medical research!

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**A GIFT IN YOUR WILL CAN SAVE LIVES**

All kinds of people include a gift to QIMR Berghofer in their will. It doesn’t mean neglecting your family and friends. Of course they come first. We understand that.

Through your gift, regardless of size, you have the potential to improve the health and lives of all of us, young and old.

Your legacy will help secure the future of QIMR Berghofer’s vital research. Every dollar you gift to us will go directly to support medical research. Come and see our work first-hand. We’d be delighted to show you around and introduce you to our dedicated scientists.

For more information, please call Heather Stott on free phone 1800 993 000.
BE INSPIRED BY THE WONDER OF SCIENCE

As an official program partner of the World Science Festival Brisbane, QIMR Berghofer Medical Research Institute invites you to be inspired at the many exciting events held in Brisbane and regional Queensland.

Gladstone 2 - 3 March
Chinchilla 9 - 10 March
Toowoomba 16 - 17 March
Brisbane 21 - 25 March
Ipswich 22 March
Townsville 25 - 26 March

Find out more: search QIMR Berghofer WSF

Other ways to donate to QIMR Berghofer Medical Research Institute

Online
Visit qimrberghofer.edu.au/donatenow

Phone
Free call: 1800 993 000
Monday to Friday, 8:30am-4:00pm AEST

Direct Deposit
BSB: 034 071
Account number: 000476
Account name: QIMR Berghofer Donations
Reference: (Surname & initials or Donor ID)