Major Alzheimer’s study launched

Exciting results in cancer treatment using immunotherapy

New neuroscientist joins team

Exercise helps breast cancer survivors
I hope your 2017 is off to a good start. It is with great pleasure that we update you on the latest research findings at QIMR Berghofer. Some of this research simply couldn’t have been done without your support, so we hope it will be satisfying for you to read about the great work that’s happening because of your generosity.

Tragically, the burden of dementia, depression and other mental illnesses continues to grow. QIMR Berghofer is responding to this by expanding our mental health program. Recently we have attracted world-class researchers in this area and you can read about their work in this issue.

The start of the new year is a good time to review our achievements in 2016. Last year we developed an online test to determine the risk, for people aged 40 and over, of developing non-melanoma common skin cancers in the next three years.

We also found that an antibody slows several common cancers from spreading, and identified previously unknown genetic drivers of breast, oesophageal and endometrial cancers.

We also shared the good news that Australia no longer has the highest rates of melanoma in the world.

Losing this unwanted title has come about, in part, thanks to the efforts of our many skin cancer researchers such as Professor Adele Green, AC, who was the first person to scientifically prove that daily sunscreen use can prevent melanoma in adults.

While much of our research is aimed at improving the lives of Australians, last year we made major advances in our quest to save lives in some of the most disadvantaged parts of the world. We developed a protein that completely cures mice of malaria, and we found that a protein switches off HIV infection in cells.

This work continues apace and we look forward to sharing this year’s achievements with you.

Once again, I’d like to thank you for helping us to create the future of health.

Professor Frank Gannon
Director and CEO
‘We hope that in future doctors might be able to give patients immunotherapy and surgery, which would avoid the side effects of chemotherapy.’

Immunologists at QIMR Berghofer have made a discovery that they hope could dramatically improve survival rates for some cancers in future.

Dr Michele Teng and her team conducted a study of triple negative breast cancer in mice and found that about half were cured when they received immunotherapy drugs before surgery, rather than after. In contrast, when the mice received the current regimen of immunotherapy drugs after surgery, very few were cured.

Triple negative breast cancer tends to be more aggressive than other types of breast cancer and is more likely to metastasise, or spread, and recur.

Immunotherapy drugs work by changing the way the molecules on the surface of immune cells communicate with the molecules on the surface of cancer cells, allowing the immune cells to detect and destroy the cancer cells.

‘In the last five years, immunotherapy has been shown to be effective in a range of advanced cancers, including lung cancer, melanoma and kidney cancer,’ Dr Teng said.

‘We wanted to find out when the best time was to schedule immunotherapy. Traditionally, cancer patients have had surgery to remove the primary tumour, and then received supplementary treatments like chemotherapy or radiation to destroy any cancer cells that might have spread.

‘To our surprise, when we gave mice a combination of two immunotherapy drugs (anti-PD1 and anti-CD137) before surgery, between 40 and 60 per cent were cured of triple negative breast cancer. It appears that this therapy destroyed any cancer cells that had spread to other parts of the body and stopped the cancer from returning. In contrast, when mice received the drugs after surgery, between zero and 10 per cent of them were cured.

‘This is very exciting data. We have already shared it with clinical oncologists and clinical trials are now underway worldwide to see if giving immunotherapy drugs before surgery could improve survival rates in humans with breast, kidney and bladder cancer, and melanoma.’

The researchers found the mice that received immunotherapy before surgery had higher levels of an immune cell known as tumour-specific T cells. These cells are responsible for recognising and destroying cancer cells.

‘In the last five years, immunotherapy has been shown to be effective in a range of advanced cancers, including lung cancer, melanoma and kidney cancer,’ Dr Teng said.

‘We think that giving immunotherapy while the primary tumour is still there provokes a better immune response by generating more tumour-specific T cells that are of better quality,’ Dr Teng said. ‘We think that these tumour-specific T cells can then travel to other sites and destroy any cancer cells that may have metastasised.

‘We also found that when immunotherapy was given before surgery, the increased numbers of tumour-specific T cells lasted for a long time, preventing a recurrence of the cancer.’
‘Being able to diagnose Alzheimer’s in its earliest stages would be a huge game-changer.’

- Dr Christine Guo
QIMR Berghofer researchers have started a major, four-year study of Alzheimer’s disease. Their goal is to develop a tool to detect Alzheimer’s in its earliest stages and to identify those at high risk of developing the disease.

The study, known as the Prospective Imaging Study of Ageing (PISA), will involve a team led by QIMR Berghofer’s mental health researchers, Dr Christine Guo and Professor Michael Breakspear.

‘At the moment Alzheimer’s disease is usually diagnosed in its late stages once a patient’s functioning is impaired and damage to the brain has already occurred,’ Dr Guo said.

‘Diagnosing Alzheimer’s at this stage is a bit like trying to treat cancer in its final stages. Early intervention is critical.

‘I think the consensus is that if we can identify the patients who are either at risk or in the early stages of Alzheimer’s before any damage has been done to the brain, we would be in a much better position to reverse the pathological processes causing the disease.

‘Being able to diagnose Alzheimer’s in its earliest stages would be a huge game-changer. Quite a few drugs have been developed, but so far all of them have failed. However, some have had positive results in patients with mild symptoms.

‘Also, there is currently a lot of effort going into developing preventative programs. If we could identify people at risk at that early stage then those preventative strategies would definitely work much better.’

The team will use genetic tests to identify whether participants in the study are at low or high risk of Alzheimer’s disease.

They will then use a combination of magnetic resonance (MRI) and positron emission tomography (PET) imaging to examine changes in the structure, function and metabolism of the low and high-risk brains over time.

Dr Guo said the researchers would also use online questionnaires and smart sensing technologies to track changes in the participants’ behaviour and lifestyle in order to better understand the main risk factors for the disease.

‘We are hoping to be able to follow the participants in this study for a long time so that we can really look at the progression of brain changes in this population.’ Dr Guo said.

‘This would also allow us to study the interaction between genetic and other lifestyle factors – such as sleep and physical activity – to really dissect this interaction between the genetic and lifestyle risk factors for Alzheimer’s disease.’

The researchers are looking for up to 20 members of the public who live in Brisbane and who are aged between 40 and 80 to participate in a pilot phase of the study.

If you are interested in participating, please contact brain.recruit@qimrberghofer.edu.au and mention the PISA study.
What would you give for a second chance?

As a father of two young teenage boys and married to Debbie for nearly 20 years, all Paul wants is a little more time with his family. To be there for his sons when they need him most, through their growing years, would be everything to Paul.

But Paul and his family are going to be robbed of this time because he has just had the news that his glioblastoma (GBM) brain cancer is back. And time is running out.

As survival rates for other cancers increase, for brain cancers, and specifically GBM, they remain static.

Levels of Government funding to brain cancer are proportionately less than for most other cancers.

But, even with these factors against us, QIMR Berghofer is continuing the fight and continuing to seek funding for research into this devastating disease.

We are forging ahead with a Phase II trial using immunotherapy technologies, equipping our own immune system with the capabilities to fight cancer. The world-first trial is based on a discovery by Professor Boyd, here at QIMR Berghofer.

The trials will determine the safety and correct dose of the antibody, named KB004, in patients with GBM. It will give us vital information about blood levels and brain penetration capabilities.

It has the potential to bring us one step closer to finding a cure for this voracious cancer.

To donate, phone 1800 993 000 or visit www.qimrberghofer.edu.au
WHAT'S ON

8 MARCH

International Women's Day

International Women's Day, celebrated on 8 March each year, is a global day celebrating the social, economic, cultural and political achievements of women.

For more information on how you can get involved see internationalwomensday.com.au

22-26 MARCH

World Science Festival Brisbane

It's on again! The World Science Festival Brisbane is coming on 22-26 March 2017 and QIMR Berghofer is involved.

For a full list of all of the events and activities on offer see worldsciencefestival.com.au

Donate today

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Thank you!

QIMR Berghofer, Locked Bag 2000
Royal Brisbane Hospital QLD 4029
Ref: LL95/Feb17
Regular exercise helps women recover from breast cancer

Researchers have found women recovering from breast cancer are more likely to have a noticeable improvement in their quality of life if they follow an exercise program.

Up to 70 per cent of women who’ve had breast cancer live with chronic adverse side effects relating to their treatment. These include fatigue, lymphoedema, premature menopause, bone density loss, infertility and distress.

QIMR Berghofer health economist, Associate Professor Louisa Gordon, and researchers from QUT evaluated the effectiveness of a tailored, eight-month exercise program starting six weeks after surgery and involving up to 16 sessions with an exercise physiologist.

‘Exercise has been found to be beneficial for survival, avoiding a recurrence of breast cancer, and preventing the side effects of treatment. But most women with breast cancer aren’t active enough and exercise isn’t routinely prescribed as part of their treatment, Associate Professor Gordon said.

‘We wanted to confirm whether an exercise program helps with recovery, and work out the most economical way of delivering it.’

The study found more than three times as many women who followed the exercise program experienced improvement in their quality of life, compared to the women who didn’t exercise.

The researchers also found the most cost-effective model was for private operators to bill patients, who could claim the costs from Medicare. This model costs just $838 per patient.

‘Breast cancer rates, and survival rates, are increasing so it’s important we look for viable ways to improve quality of life for survivors,’ Associate Professor Gordon said.

‘We think it’s timely for Governments, and the broader community, to consider how much we want to spend on improving quality of life, as opposed to just treatment.’
A Gift in Your Will can help change the future of health

We are driven by an overwhelming desire to create a better, healthier world here at QIMR Berghofer. Our researchers are focused on tackling diseases that damage lives and take our loved ones from us. Cancer, dementia, malaria, asthma…the list is endless, but so is our determination.

Including a gift in your Will to QIMR Berghofer doesn’t mean neglecting your family and friends. They come first, we understand that.

By supporting our scientists’ work you can also pay something forward and really look after the next generation.

You don’t have to be rich. Everyone can make their mark with a gift in their Will to QIMR Berghofer. Through your gift, you have the potential to improve the health and lives of your children and grandchildren.

For more information please call Heather Stott on: 1800 993 000 (freecall)

Our promise to you

- We won’t put you under pressure – this is a big decision, you need to decide in your own time
- Your loved ones come first – we respect that and won’t try to change it
- Every dollar you gift to us will go directly to support medical research
- We’d be delighted to show you around QIMR Berghofer to see how your support will make a real difference
- We’ll introduce you to our dedicated scientists in their labs who will tell you about their life saving work
I have recently moved from Amsterdam (the Netherlands) to Brisbane to initiate a new research group ‘Translational Neurogenomics’.

The general aim of my research is to increase our understanding of the genetic and biological mechanisms that contribute to the risk of developing psychiatric conditions, including schizophrenia, obsessive-compulsive disorders and addiction.

My overseas move was primarily motivated by the opportunity to become part of the excellent research environment offered by QIMR Berghofer.

Working at QIMR Berghofer will allow me to perform outstanding research, due to the availability of extensive resources and the possibility to collaborate with experts in related fields.

I have a background in psychology, with specialisations in statistical methods and statistical genetics. I am interested in the wide variety of symptoms typical of patients with a psychiatric condition and pay particularly close attention to the development of new statistical methods aimed at discovering associations between genetic variants and psychiatric conditions.

The translational part of ‘Translational Neurogenomics’ refers to two different aspects of my research. Firstly, in my studies, I investigate the biological mechanisms that determine how genetic (DNA) variation is translated into RNA* and proteins. Secondly, I aim to translate novel research discoveries to the clinic, in order to improve the lives of patients suffering from mental disorders.

* RNA is one of the three major biological macromolecules that are essential for all known forms of life (along with DNA and proteins).
Dementia researcher driven to make a difference

‘A real treatment, a real hope, that’s the thing that we’re all really hoping will come out in the next few years.’

QIMR Berghofer has recently welcomed Associate Professor Tony White. He has spent more than 20 years researching neurodegenerative conditions, including dementia, Parkinson’s disease and motor neuron disease.

‘The research that I’m involved in is looking at what happens at the cellular and molecular level in Alzheimer’s disease and similar degenerative brain disorders,’ White explains.

But his experience with dementia isn’t purely academic. In 2006 White lost his mother after an eight-year battle with Alzheimer’s disease.

‘I guess it was quite an awakening for me,’ he says. ‘As a neuroscientist, you have a broad understanding of what Alzheimer’s is, but you’re focused on what happens at the cellular level and the molecular level. To see how that translates into how it affects a person is not nice to see in anyone, let alone your own mother.

‘I think the hardest part was seeing how my father had to deal with it over the seven or eight years that he cared for her.

It’s as hard on the people around them as on the patient themselves, especially in the later stages of the disease.’

But White says the experience has given him a new insight into the importance of research. ‘I became more aware of how our research really impacts people and the importance of trying to get some kind of treatment that can offer people some hope of slowing the disease down, if not curing it.’

One of White’s current projects is trying to develop an accurate laboratory model of a human brain with Alzheimer’s, which would help scientists find new ways to target the disease, and allow for better testing of potential new drugs.

‘We grow cells from human stem cells, and we change them into the different brain cell types – neurons, glia, and the microglia, which are the inflammatory cells – and we can put them together in a 3D model. It provides a reasonably good representation of the brain but still allows us to look at how the cells behave and to look for new targets to treat the disease with,’ White says.

Another focus of his research is the role of biometals – including copper, zinc and iron – in brain inflammation and neurodegenerative diseases. He and his former colleagues at the University of Melbourne have developed a copper-based compound, which has just entered clinical trials as a potential new treatment for motor neuron disease. White and his international collaborators have also shown that the same compound can help protect mice against stroke.

‘We’re trying to continue to develop this compound, and related ones, and see whether they could potentially be a treatment for Alzheimer’s as well,’ says White.

‘Unfortunately there’s been quite a failure of the drugs in clinical trials to actually make any difference to Alzheimer’s patients, which just makes what we’re doing more important, to try and understand new pathways of the disease and to identify new targets and drugs.’
High achiever

While other Year 12 students spent last year studying, inspiring teenager Sally Stephens added fundraising to her already heavy workload. Motivated to raise funds after losing her mother Peggy to leukaemia six years ago, Sally hosted a number of fundraising events, including a school sausage sizzle and a dinner for over 80 people. Her fundraising culminated in Sally shaving off her long locks late last year on her 18th birthday, bringing her fundraising total to over $11 000! We’re so in awe of your drive and dedication Sally! Thank you!

Sirromomet winery

Andrew Miosch, Executive Chef at Sirromet Wines and regular on Channel 7 Creek to Coast, was so inspired by a young cancer survivor that he shed his trademark 20+ year dreadlocks to raise money, and awareness, for cancer research at QIMR Berghofer.

Over 200 guests witnessed the momentous shave at a special Sirromet luncheon hosted by Chief Winemaker, Adam Chapman, that included a raffle, silent and live auctions.

Former Australian cricketer, keen fisherman and mate of Andrew, Matthew Hayden, also bowled in a donation to chop one of the dreads and to shave Andrew’s legs.

We are grateful to Andrew for honouring all cancer patients as he and Sirromet assist us to find a cure for cancer. Thank you to everyone who supported this amazing event.

To donate to our research phone 1800 993 000 or www.qimrberghofer.edu.au

Be involved

Become a community fundraiser – check out our new fundraising portal for ideas or contact Fundraising Officer Natalie Guardala on natalie.guardala@qimrberghofer.edu.au or 07 3845 3908.

Get your workplace and colleagues on board to a healthier future. To learn about the opportunities and benefits for your organisation contact Corporate and Community Engagement Coordinator Anna Welch on anna.welch@qimrberghofer.edu.au or 07 3845 3747.

Thank you to all of our very special fundraisers – you’re the best!