Cracking the genetic code of clinical depression • Page 4

Bronchiolitis linked to asthma in children • Page 6

Malaria goes under the microscope • Page 8
A note from the Director

Welcome to another exciting edition of LIFELAB, our quarterly magazine. We trust you will enjoy reading the latest news from the Institute.

In this edition, we take a closer look at the Australian Genetics of Depression Study, where QIMR Berghofer is leading the Australian contingent of the worldwide study. The study has recruited almost 15,000 people to take part to try to identify the genetic drivers of clinical depression and the influence these genes have on the effectiveness of antidepressant medications. Read more on page 4.

We are very excited to have malaria trials currently in progress at our Q-Pharm clinical trials facility. Recently, our researchers have revealed some promising developments in the clinical trial model that is making it more efficient to test whether vaccines and drugs are effective at preventing and treating malaria. Read more on page 8.

We also explore the Indigenous Program at QIMR Berghofer and the work that numerous individuals are undertaking to address the burden of disease among Australia’s first people. The program is as far-reaching as Thursday Island and includes research initiatives, traineeship programs and a regional high school lecture series. Read more on page 10.

I would like to convey my sincere appreciation to everyone for the most generous contributions made to our recent Melanoma Appeal. As always, your continued support of medical research is essential and greatly appreciated, with 100 per cent of all donations directly funding our research.

Professor Frank Gannon
Director and CEO

A note on our packaging

Stay informed of the latest news from QIMR Berghofer by receiving LIFELAB in your inbox or letterbox. Simply visit www.qimrberghofer.edu.au/newsletter

Your LIFELAB Issue 99 was delivered in ‘EcoPureTM’ plastic wrapping and is 100% biodegradable. The paper is FSC certified.

We are committed to seeking improvements that foster a sustainable future and incorporate our mission of better health through medical research.

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Contents

4 Cracking the genetic code of clinical depression

6 Bronchiolitis linked to asthma in children

8 Malaria goes under the microscope

10 Engaging Indigenous Australians

12 Hope for guiding prostate cancer treatment

14 Students experience life as a scientist

16 Q&A with Professor Nick Martin

18 Community

Cover Image
Artist impression of a particular gene variant associated with clinical depression.
Illustration: Tal Bavli, QIMR Berghofer
The World Health Organization (WHO) predicts that by 2020, clinical depression will impose the second highest burden of any disease globally. Clinical depression is a common mental illness, often referred to as depression or Major Depressive Disorder (MDD), which will affect one in seven Australians during their lifetime. It is a complex illness, often occurring in families, and is typically caused by a combination of genetic and environmental influences.

QIMR Berghofer’s Professor Nick Martin is the lead investigator of the Australian Genetics of Depression Study (AGDS), working in collaboration with The University of Queensland and The University of Sydney. The overarching objectives of the study are to identify the genetic drivers of clinical depression and the influence these genes have on the effectiveness of antidepressant medications, as well as other treatments like cognitive behaviour therapy and electroconvulsive therapy.

‘Clinical depression tends to run in families—we know this from our [and others’] twin and family studies. What we now need to do is find the particular gene variants that increase risk of the disorder,’ Professor Martin said.

‘Research into genetics really is the best way forward in solving these complex traits, like depression. There may be a tendency for some people to think, if it is genetic then you cannot do anything about it, but we are changing our environment all the time to outwit genetics—we have glasses assisting the myopic and the ability to change our hair colour by using dye.

‘Therefore, depression is not a life sentence that you can’t do anything about. In fact, facing up to the fact that it’s genetic can set people up for improving their environment and behaviours,’ Professor Martin said.

The AGDS aims to recruit 20 000 Australian volunteers to participate in the study. At the time of writing, 15 000 people have already taken part, helping our scientists to unlock the genetic drivers of depression.

Study coordinator, Richard Parker, is at the frontline of the recruitment process at QIMR Berghofer, where although public campaign efforts have been a great success, a further 5000 participants are still needed.
‘We are still recruiting for the study, so we have yet to complete the genotyping phase. With recruitment numbers steadily increasing, we anticipate reaching our goals by 2020,’ Richard Parker said.

The study requires each participant to complete an online survey and then to provide a saliva sample, which is vital for completing the genetic analysis necessary to detect the specific genes linked with depression risk.

‘This study will give us a much better idea of which medications work for which patient, so in future perhaps we can give people a genetic test before they are prescribed antidepressants,’ Professor Martin said.

There has been such a great response from the community, highlighting the need for further awareness through medical research.

Professor Martin explained that some parents have been saying ‘Where did we go wrong? My child’s depressed’, stressing that being able to acknowledge that genetics plays a role in this disease could greatly help people with acceptance.

‘A number of people have said that running this project, and highlighting that genetics plays a role in depression and suicidality, is tremendously liberating for a lot of people,’ Professor Martin said.

Richard Parker echoes this sentiment.

‘It’s ground breaking—we’re demystifying the disease. There is a lot of self-blame and guilt as a characteristic of having a depressive disorder, so studying the genomics is a pioneering way of looking at the disease,’ Parker said.

The AGDS is associated with a large worldwide consortium initiated by the International Society of Psychiatric Genetics—a global network of the scientific community who recognised that collaboration was necessary to make the significant breakthroughs desperately required to decode this oppressive disease.

‘There is a tremendous spirit of international cooperation, because it’s widely recognised that to thoroughly comprehend this disease we need to combine knowledge across the world—no one country is going to achieve this on their own,’ Professor Martin said.

The study encourages new participants to sign up by visiting www.geneticsofdepression.org.au. To be a participant, you need to have been diagnosed with clinical depression at any time in your life and be willing to provide a saliva sample.

Artist impression of a particular gene variant associated with clinical depression.
Bronchiolitis linked to asthma in children

Asthma is a chronic disorder affecting millions of Australians. QIMR Berghofer's latest research in this field features a recent study led by Associate Professor Simon Phipps to help uncover the link between asthma, the immune system and respiratory virus infections in children.

He knows he shouldn’t run, but he wants to join the fun, and just maybe, this time it will be different and he won’t feel the familiar shortness of breath when exercising… Oh no, here we go again. Difficulty breathing. Chest tightness. Coughing air. The panic starts to set in. Must reach the prescription asthma inhaler! Fumbling around in his sports bag for the cylindrical device, and then just a couple of puffs is all it takes to bring about instant relief.

Any asthma sufferer will be familiar with this obligatory, yet terribly unfortunate, ritual.

In Australia, more than 400 deaths are caused by asthma each year. Alarmingly, asthma is on the rise, affecting 1 in 9 Australians—around two-and-a-half million people—with the majority of diagnoses occurring when children reach school-age. It is not surprising then that researchers at QIMR Berghofer are dedicated to taking a closer look into why this chronic disorder is so prevalent.

Associate Professor Simon Phipps, from QIMR Berghofer’s Respiratory Immunology Laboratory, was the lead researcher on a study investigating the link between asthma, the immune system and respiratory viruses—in collaboration with The University of Queensland, Queensland University of Technology, The University of Western Australia and The University of South Australia.

The findings suggest that developing severe viral bronchiolitis very early in life (inflammation of the small airways) and having low levels of a particular type of immune cell both contribute to the risk of a child developing asthma.

‘A number of epidemiological studies worldwide have previously shown that babies who develop severe viral bronchiolitis in infancy are at significantly higher risk of developing asthma by age five,’ Associate Professor Simon Phipps said.

‘Separately, studies have also found that babies who go on to develop asthma have lower counts of an immune cell, known as a plasmacytoid dendritic cell (pDC).’

‘Our study provides evidence that the combination of having low levels of pDCs very early in life, together with a respiratory virus infection, sets you up to develop asthma in childhood.’

-Associate Professor Simon Phipps
‘These previous findings raised a number of questions: Does having low levels of pDC cause both viral bronchiolitis and asthma, and, if so, how? Or, does the viral bronchiolitis early in life cause the onset of the asthma?’ he wondered.

In pre-clinical trials, the research team found that viral bronchiolitis resulted when low levels of pDC were present. Importantly, even if the levels of pDC returned to normal, the infants that had experienced bronchiolitis in infancy were now at risk of developing asthma.

‘Our study provides evidence that the combination of having low levels of pDCs very early in life, together with a respiratory virus infection, sets you up to develop asthma in later childhood.

‘Nearly all children will be infected with a virus known as respiratory syncytial virus, or RSV, by the age of two. Our findings suggest that individuals with low pDC counts in infancy (less than six months of age) are at greater risk of severe viral bronchiolitis, and that this is causally linked to the development of asthma in childhood,’ Associate Professor Phipps said.

Phipps states that older children are at lower risk because their immune response is more mature, and that this is partly as a consequence of good gut health.

‘Our preliminary findings suggest that age is important because as babies’ gut microbiomes develop, the ‘good’ gut bacteria can help to protect against both severe viral bronchiolitis and asthma,’ he said.

The gut microbiome begins to assemble immediately after birth, and is supported by breastfeeding. Western lifestyles, including a reduction in vaginal birth and higher rates of feeding with infant formula, affect the assembly of the microbiome. As a consequence, the baby’s immune system can develop differently, which could have long-lasting effects into later childhood and adulthood.

Preventing babies from developing bronchiolitis in the first few years of life will lower the risk of children developing asthma. However, in infants who develop bronchiolitis, there is also a need to develop innovative treatments to halt the progression to asthma, and Associate Professor Phipps’ research group has a number of targets that they are currently focusing on.

‘Our hope for the future is that when a baby is admitted to hospital with bronchiolitis, we can treat them with new therapies which can prevent them developing asthma.’

-Associate Professor Simon Phipps

‘Our hope for the future is that when a baby is admitted to hospital with bronchiolitis, we can treat them with new therapies which can prevent them developing asthma.

-Associate Professor Simon Phipps

Artist impression of airborne viruses.
Malaria is a mosquito-borne parasitic infection affecting over 250 million people around the world and is estimated to have killed more than 445,000 people in 2016 alone; most were children under five years old. About two billion people worldwide live in countries afflicted by malaria.

The latest World Health Organization (WHO) report reveals 91 countries documented malaria cases in 2016—mainly in Africa, South-East Asia and eastern Mediterranean regions—recommending international travellers take preventative medication prior to, during and upon returning from their travel. But what about the millions of people who live in the malaria-affected areas? How do they protect themselves from this life-threatening disease on a daily basis?

Our researchers have made a great step forward into addressing the global concern with the design of a clinical trial model that makes it more efficient to test whether vaccines and drugs are effective at preventing and treating malaria.

The Head of QIMR Berghofer’s Infectious Diseases Program, Professor James McCarthy, and Dr Katharine Collins developed and showed the safety of a clinical trial model that enables testing ways to stop the spread of malaria parasites from humans to mosquitoes.

‘Strategies to treat malaria infection and to prevent people from being bitten by mosquitoes, such as bed nets, have had a noticeable impact on reducing the global burden of disease,’ Dr Katharine Collins said.

‘However, progress has recently stalled. If we want to eliminate malaria altogether, in addition to treating people when they are sick, we also need to reduce the spread of malaria parasites from humans to mosquitoes and back again.’

-Dr Katharine Collins

QIMR Berghofer is a world leader for safely testing new drugs for malaria, a leading cause of death globally and a continuing major health problem for our near neighbours in Asia. Excitingly, our researchers have designed a clinical trial model that could help develop more efficient malaria treatments.
people when they are sick, we also need to reduce the spread of malaria parasites from humans to mosquitoes and back again.

‘That’s why we have developed a clinical trial model that will allow drug and vaccine developers to specifically test for the transmission of malaria parasites from humans to mosquitoes,’ she said.

A person generally becomes sick with malaria around 10 days after they are bitten by an infected mosquito. That person can be treated for malaria and no longer show any symptoms of being sick, but still have malaria gametocytes circulating in their blood stream. Unfortunately, the gametocytes are the stage of the malaria parasite that is transmitted back to mosquitoes.

‘If a mosquito bites a person when they have gametocytes in their blood, after about two weeks that mosquito can then potentially infect anyone it bites. If we can stop this process, we can stop the spread of the disease among humans,’ Dr Collins said.

Developing treatments that target and kill the gametocytes will make it much easier to eliminate malaria altogether. Therefore, it is vital that clinical trial models, such as this one, are developed to ensure drugs and vaccines that aim to prevent malaria transmission can be safely, and quickly, tested.

‘Using this clinical trial model we can now test whether drugs are effective at blocking the transmission of malaria parasites from humans to mosquitoes, which will greatly facilitate the process of testing the efficacy of new drug development,’ Professor James McCarthy said.

The WHO Global Technical Strategy for Malaria 2016–2030 communicates an aim to reduce global malaria mortality rates and case incidence by at least 90 per cent by 2030. The global drive for this research is demonstrated with the Bill & Melinda Gates Foundation supporting these clinical trials, which are being carried out at QIMR Berghofer’s clinical trials facility, Q-Pharm.

‘We are very fortunate to have the Q-Pharm clinical trial facility located within the Institute, and a special quarantine insectary, so that we can safely study transmission of malaria from humans to mosquitoes in a controlled clinical trial model. Identifying whether new drugs reduce the population of gametocytes is an important end-point of the study,’ Professor McCarthy said.
Engaging Indigenous Australians

QIMR Berghofer’s Aboriginal and Torres Strait Islander program aims to prioritise health concerns that are community-identified and that have the greatest opportunity to improve the burden of illness for Aboriginal and Torres Strait Islander Queenslanders.

QIMR Berghofer engages in research that benefits rural, remote and urban Queensland and supports initiatives of national importance to the health of Indigenous Australians. We are currently conducting research into 38 diseases significant for Indigenous Australians.

Gregory Pratt is the Indigenous Health Research Manager at QIMR Berghofer, working with the advisory group to identify areas of strategic importance and ensuring researchers, communications and support staff address issues that directly affect Indigenous Australians.

“We value the integrity, solidarity and resilience of the traditional owners of this country and commit to support the first peoples of Australia overcome the disparity between their health status and that of non-Indigenous Australians,” Gregory Pratt said.

These are a few initiatives that are currently in progress:

**Cancer**

Associate Professor Patricia Valery and her team are investigating the patterns of care experienced by Indigenous people diagnosed with cancer in a primary health care setting. The study aims to identify barriers to appropriate cancer care for Indigenous Australians; our aim is to provide these findings to the health care system for facilitating the necessary changes.

‘Through in-depth interviews with Indigenous people who have been diagnosed with cancer and health professionals, we are exploring the different perspectives regarding the follow up and coordination of care for Indigenous cancer patients,’ Associate Professor Valery said.

**Mental Health**

In general, people experiencing mental illnesses (e.g. depression, anxiety and psychotic disorders) tend to be inactive and have poor diets and, when combined with the side effects of some medications, they’re at higher risk of early mortality from preventable physical diseases. There has been very little research conducted on the impact that lifestyle changes have on the physical and mental health of Indigenous adults with mental illness.

“We know lifestyle factors, such as physical activity and healthy diet, have a significant impact on mental health. QIMR Berghofer and PCYC Queensland are currently working together on a project in Far North Queensland to evaluate the effect of an exercise and nutrition program for Indigenous adults who are currently experiencing mental health issues,” Dr Justin Chapman said.

Judy Watson’s *Water Memory* reflects the many histories of the QIMR Berghofer site. Underpinning all of this is the history of the Traditional Owners, the Aboriginal people who were here on this place, the Turrbal and Jagera people.
Scabies
Scabies is a neglected infectious parasitic disease affecting millions of people worldwide, and importantly a high percentage of Indigenous Australians. In hot climates, scabies is inextricably linked to high rates of pyoderma, chronic rheumatic heart and kidney diseases, invasive bacterial sepsis and represents a huge, persistent public health burden. There is no national strategy or effective intervention tools in place to control or eradicate this disease. The research program undertaken by Dr Katja Fischer and her team will greatly improve knowledge of scabies and expedite the urgently needed tools for its control.

‘Firstly, we will develop baseline molecular knowledge, specifically on the mite and bacteria that cause the disease in humans, which will provide the basis for improved treatment and management strategies. From here, we aim to develop a medication that is effective in treating the disease with a one-dose topical treatment, which will substantially improve clinical management and cure,’ Dr Fischer said.

‘Our laboratory-based research is aligned with the needs voiced by patients, families and health staff exposed to the burden caused by scabies in remote communities of northern Australia. We undertake a range of outreach activities to increase public awareness for skin health, to seek input from affected community members and to expose our team to the local situations, so they develop a deeper understanding of the burden and the needs,’ she said.

Genomics
QIMR Berghofer is engaging in research that will directly involve Indigenous communities across Queensland in the field of genomics. The Indigenous health research team is developing a comprehensive guideline for researchers undertaking genomic and genetic research involving Aboriginal and/or Torres Strait Islander Queenslanders.

‘This genomics project will encompass a series of seven community forums in five regions across Queensland to build capacity, improve awareness and communicate the health benefits associated with embracing genomics and precision medicine for this valued community,’ Project Officer, Sid Kaladharan said.

Researcher Traineeship
The team is also fortunate to have appointed a Scientific Technical Officer trainee within the department, where Kiri Fabila is helping Manuel Ferreira’s lab understand how specific genes make some Indigenous people more likely to suffer from asthma than others.

Regional High School Lecture Series
The QIMR Berghofer Regional High School Lecture Series is a communication initiative for the benefit of both Indigenous and non-Indigenous students from regional Queensland, where students hear from leading research scientists. Here, the researchers are mentors and role models that stimulate unity and discussion around relevant health topics, while promoting the importance of scientific health research, tertiary education and health science career pathways.

‘The series has really expanded over the years. This year, we will visit sixteen schools and reach approximately 1600 students across regional Queensland, including Toowoomba, Gladstone, Rockhampton, Townsville, Cairns and Thursday Island,’ Indigenous Communications Project Officer, Corey Jones, said.
Hope for guiding prostate cancer treatment

Medical researchers believe they may have unearthed a potential new way of testing how advanced a patient’s prostate cancer is, which may one day be used to tailor treatments for patients.

QIMR Berghofer Medical Research Institute senior research officer Dr Carolina Soekmadji has identified potential biomarkers for advanced prostate cancer.

The extracellular vesicles (EVs), which are enclosed lipid membranes secreted by cells, provide information on the lipid, protein and nucleic acid content of the cancer cells.

Dr Soekmadji said the secretion of a particular type of EV was higher in patients with prostate cancer than it was for men who had an enlarged, but benign, prostate. The same vesicle was also found in higher numbers in patients with advanced prostate cancer, providing a strong connection that these are potential biomarkers.

The EVs can be measured via a simple blood test, offering a less invasive way to detect prostate cancer.

The secretion of these vesicles by prostate cancer cells is also influenced by the presence of androgen, a male hormone that is widely known to drive prostate cancer growth.

‘While further investigation is needed, this tells us that the presence of EVs could be important not only as a prostate cancer biomarker for diagnosis and prognosis, but may allow clinicians to make a more informed decision regarding treatment regimes,’ Dr Soekmadji said.

Androgen Deprivation Therapy (ADT) is a common hormonal treatment for advanced prostate cancer, but often causes many unpleasant side-effects, including hot flushes, decreased libido, erectile dysfunction, the development of breast tissue, abdominal obesity and osteoporosis. However, there are some patients who experience treatment benefits, without the side-effects.

‘We hope that clinicians can use this biomarker information to identify patients who will have a positive response to Androgen Deprivation Therapy in the not too distant future,’ Dr Soekmadji said.

Murray McLachlan, 64, knows the many treatment pathways of a prostate cancer diagnosis first-hand. Murray was diagnosed with prostate cancer nine years ago, after receiving a high PSA reading and biopsy results revealing he had advanced stage prostate cancer. Due to the advanced stage of the
cancer, his treatment involved having a surgical radical prostatectomy using the Da Vinci robotic machine.

‘After speaking with my oncologist, other forms of treatment, including ‘watchful waiting’, ADT and brachytherapy, were not viable options. His view was that a radical prostatectomy via the robotic machine was the best option,’ Murray said.

‘It is unfortunate that possible side effects are too often presented as major reasons for not going ahead with the procedure. In my experience, there aren’t many men who have regretted having taken the surgical option, when not having done so may have resulted in a premature death,’ he said.

Understandably, prostatectomy may not be the preferred treatment method for everyone, so specifically knowing which treatments will be effective for which patients is the way forward for tackling this stealthy cancer. Biomarkers play a vital role in this process.

Murray firmly believes that any additional detection information that may result, for example from Dr Soekmadji’s work on biomarkers, is certainly a good thing from the perspective of those facing a prostate cancer diagnosis.

‘We also hope that one day clinicians may be able to use this information to tailor therapies to suit the biological background and make-up of each individual patient,’ Dr Soekmadji said. ●

Research in partnership

QIMR Berghofer is bringing its world-leading medical research to Dubai by partnering with the region’s health authority. QIMR Berghofer and the Dubai Health Authority signed a three-year Memorandum of Understanding (MoU) at a meeting held in Dubai, and attended by Queensland Deputy Premier, Jackie Trad.

Ms Trad said it was a significant partnership, which demonstrated the world-class standard of medical research happening in the state.

‘It really is incredible to see a Queensland institute taking the lead here in Dubai that will support the lives and health of many people,’ she said.

QIMR Berghofer’s Director and CEO, Professor Frank Gannon, said the international partnership would establish strong and collaborative research and training links in cancer diagnosis, with potential to be expanded to other diseases.

‘This agreement provides unique opportunities for our researchers to continue their work in the field of genomics,’ Professor Gannon said.

QIMR Berghofer’s Associate Professor Fares Al-Ejeh, who secured the partnership, said it was an exciting first step and another way for the Institute to benefit human health on a global scale. ●

Pictured above: Professor Frank Gannon, Queensland Deputy Premier Jackie Trad and the Dubai Health Authority Director General, His Excellency Humaid Al Qatami.

Extracellular vesicles could be potential biomarkers for prostate cancer.
Each year, QIMR Berghofer invites year 11 and 12 students to apply for a place in our coveted high school work experience program. Successful applicants are rewarded with the opportunity to don a white lab coat and spend an eye-opening three days working in the laboratories.

Jessica Devenport and Julian Hardman from Kimberley College were two of the lucky applicants for the 2018 program. The first day was spent undergoing basic lab skills training in the education lab, with the following two days spent working with researchers in the Molecular Parasitology Laboratory.

‘It’s been excellent, really hands on. Everyone has been great at explaining things at a good level and there’s been lots of opportunities for us to have a go and try it out for ourselves,’ Julian said.

‘The past three days have been really informative and educational. We’ve been shown real life applications of the sciences—it’s not just the cell biology that you learn at school, it’s what applications science has and the potential diseases it can cure,’ Jessica said.

The high school work experience opportunities at QIMR Berghofer are part of the Institute’s broader education program, which aims to give students that demonstrate an interest in science an insight into the world of medical research as a career pathway.

So, would they recommend the opportunity to other senior students?

‘Yes! It’s these types of experiences, especially at our age as we are about to decide what we want to do with our lives, that get you to try different things to see whether you like it or not,’ Jessica said.

‘It’s definitely made me want to pursue a career in science—I mean I already did want to pursue something science-related—but this has definitely solidified my decision. The environment is just so nice,’ Julian said.

This year we received 130 applications for only 35 places, so we have extended the program to have another opportunity for students to engage with us this September. Applications are now open for a one-day experience during the school holidays on Friday 28 September. Contact the Education Coordinator at schools@qimrberghofer.edu.au for further details.

Did you ever imagine working as a scientist? QIMR Berghofer opens its laboratories to a limited number of year 11 and 12 students interested in pursuing a career in science through our high school work experience program.
Christine and her husband, Sid Faithfull, first met Dr Day in 2013 when Sid was suffering from glioblastoma, a type of tumour that occurs in the brain. At about this time, the couple made the decision to support the work that Dr Bryan Day and Dr Andrew Boyd were undertaking in brain cancer. Sid’s values and purpose—to improve the lives of others—were closely aligned with the mission of Dr Day and his team.

‘It’s an honour to be bestowed with the Sid Faithfull Fellow and I think it is fitting that our laboratory will now be named in Sid’s memory. The funding will enable us to continue to expand our world-class research activities and support the next generation of talented young scientists through a named PhD scholarship,’ Dr Day said.

Sadly, Sid passed away in 2014 at the age of 68. While Sid’s life was cut short, his ingenuity and foresight will live on with the legacy that he leaves all of us.

While Sid understood that supporting this research would not save his life, he and Christine wanted to do everything they could to assist researchers in their bid to improve outcomes for brain cancer sufferers in the future.

Sid Faithfull was a visionary. Much like our scientists researching brain cancer, Sid realised opportunities and had the courage of his convictions to drive change and innovation. He was a quiet achiever, an entrepreneur who founded Australia’s largest privately owned shipping company, Sea Swift.

‘Rest assured we are trying our very best every day to bring about change for people suffering from these aggressive, incurable diseases. Sid’s legacy, entrepreneurial spirit, courage and hard work is an inspiration to us all,’ Dr Day said.

Now is a time for hope. We have seen recent efforts at a federal level giving brain cancer the prominence it deserves. This has ignited a spark in the Australian neuro oncology community where we, as a community, are very hopeful for significant progress over the next decade.

On behalf of the Sid Faithfull Brain Cancer Laboratory team, Dr Day would like to sincerely thank Christine, Sid and their extended family for the generous contribution they have pledged to brain cancer research at QIMR Berghofer.

Dr Bryan Day with Christine Sadler and Professor Frank Gannon at the unveiling of the Sid Faithfull Brain Cancer Laboratory.
Describe your field of medical research.
In genetic epidemiology we try to understand why so many diseases run in families; it could be because of genes, or family environment, or some combination of both. The comparison of identical and non-identical twins allows us to estimate the relative contribution of these two in the aetiology of any human trait, which is why I spent the first half of my career doing twin studies. [Aetiology is the science that deals with the causes or origin of disease, with the view to identify the factors that produce or predispose toward a certain disease or disorder.] Now we know that genes influence almost every aspect of human existence, the challenge is to find and characterise the particular genes responsible. The Genome-Wide Association Study (GWAS), dependent on the development of ‘gene chips’ in 2005, has been amazingly successful at identifying the genes behind a host of different biomedical traits and diseases.

How did you end up in science?
My father was a scientist and I grew up living and breathing science at every turn. More specifically, there’s something about genetics that engages me at a very basic level, the ability to infer complex biological mechanisms purely from statistical data. The power and the beauty of it never cease to astound me.

How has public discourse about the role of genetics in disease changed throughout your career?
Astonishingly, it has changed even in the past 10 years. The phrase ‘It’s in your DNA’ seems to have taken over the world. When I began in the subject in the early 1970s there was still enormous hostility to the idea that genetics had a role in common disease, or behavioural differences. Now almost everyone accepts it.

Your breakthrough research into twins led you to establish the Australian Twin Registry in the late 1970s. What are some of the key outcomes of the ongoing study?
Simply that there is virtually no aspect of the human condition that is not influenced by genetic differences—most traits/diseases are 30%–80% heritable. Also, that the role of family environment, so emphasised by early social scientists, seems surprisingly weak for most traits.
What was/is one of the biggest obstacles you faced with your research, and how did you overcome it?

Initially it was the paucity of twins available for research projects, and founding the Australian Twin Registry in 1978 solved that problem. We had 15 000 twin pairs in the first year and 30 000 within five years.

In 2017 you launched the world’s largest genetic investigation into depression. What do you hope will be some of the outcomes of the study?

Finding the genes behind depression and response to antidepressants will enable development of better pharmaceuticals and the tailoring of prescriptions to the individual for maximum efficacy and minimum side-effects.

‘...there’s something about genetics that engages me... the power and the beauty of it never cease to astound me.’
-Professor Nick Martin

What is your proudest career highlight to date?
Being elected as a fellow of the Australian Academy of Science.

What do you like about working at QIMR Berghofer?
Congenial colleagues and an atmosphere and infrastructure that just lets you get on with research.

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

If you weren’t a scientist, what would you be and why?
A gardener. I love plants.

DID YOU KNOW...

Professor Martin was recently listed as one of the world’s top 250 most cited scientists of all time.
Lab techs from the 1950s stop by

The Institute was surprised and delighted to recently hear from two previous employees, Pat Buchanan and Betty East. They became friends working as cadets for QIMR, as it was then known, in the 1950s and are still best friends today.

Pat said, ‘Betty was up visiting for the weekend and had never been back to the Herston worksite, so I said “Want to do something exciting?”’. We made a phone call and that was it. We had the best time visiting QIMR Berghofer’.

When Pat and Betty worked at the Institute, it was a small tight-knit team of about 40 scientists and support staff working out of an old post-World War II hut, affectionately named Hut 8.

Pat was invited on two field trips to the Mitchell River Mission, now Kowanyama, in the Gulf of Carpentaria. These trips were essential for collecting specimens for research, creating scientific history and memories that would last a lifetime.

‘A couple of us were invited on a fishing trip with some of the local Aboriginal people. They remembered the outboard but forgot the oars. After about half-an-hour the outboard spluttered to a halt, so here we were in crocodile-infested waters using a woomera and our large specimen-collecting spoon as oars! These trips to Mitchell River were a highlight of my time at QIMR and it was an honour to be selected to attend,’ she said.

In 1962, when Pat married, women in the public service had to resign upon marriage. Her manager Ralph Doherty applied to the government for a one-year extension to allow her to keep working, which was granted. This was quite an exceptional circumstance, demonstrating that Pat was an integral member of the team.

Needless to say, just a few things have changed in the past 65 years.

‘Betty and I were aware of the huge achievements in medical research by scientists at QIMR Berghofer, but it was a revelation to see and hear from the scientists themselves.

‘It was a feel good experience to know that we had played a very small part in the early days of this wonderful institution,’ Pat said.
What are Breast Friends for?

Champagne, high tea, fun times and fundraising of course!

Breast Friends Limited is a tight-knit group of friends raising money for the ultimate goal of a cancer-free future, and we are so pleased that they choose to donate to QIMR Berghofer, as well as a number of other organisations. The net profits raised from their many events and projects are maximised, because the charity is run by volunteers and incurs no administration costs.

Last month, the group hosted the Breast Friends Afternoon Out event—an event created from the desire to enjoy time with friends while raising money for a cause that is close to everyone’s heart. Victoria Park Golf Complex hosted the event in the stunning marquee room, where 150 guests were welcomed with champagne on arrival, followed by a decadent high tea.

The guests also had the opportunity to meet Dr Adrian Wiegmans from QIMR Berghofer, who gave an inspirational presentation on the day.

‘Just listening to Adrian talk about the ground-breaking work that the medical researchers are currently doing to combat this disease, and being able to contribute to this, is what Breast Friends is all about,’ Tricia Mahoney, Breast Friends founder, said.

Breast Friends was established in 2011 when Tricia endured a lumpectomy, chemo and radiation. Their fundraising efforts have already funded new equipment for scientists, and have provided funds for groups who support women and their families going through gruelling cancer treatment.

‘It goes without saying that we’re passionate about raising money for our ultimate goal of a cancer-free future,’ Tricia said.

The fundraising total for the Breast Friends Afternoon Out was $10,587. Thank you Tricia and all of the Breast Friends for your generosity.


Enter to win new book

Josie Dietrich has graciously shared her story about tackling breast cancer in previous editions of LIFELAB. Now, we have one copy of her new book In Danger: A Memoir of Family and Hope to give away, valued at $29.95. To win, all you have to do is write in 25 words or less why you would most like to read Josie’s story. Entries close Sunday 30 September 2018. Send entries via email or post to:

Email: supportus@qimrberghofer.edu.au
Post: QIMR Berghofer, External Relations – Josie’s Book Competition
Locked Bag 2000, Royal Brisbane Hospital, QLD 4029

For full terms and conditions visit www.qimrberghofer.edu.au/newsletters/in-danger-competition
Australian Genetics of Depression Study

The Australian Genetics of Depression Study, which is the Australian arm of an international study created to understand the genetics of depression, is recruiting Australian adults - aged 18 and above - who have been treated for clinical depression.

Participation involves completion of an online survey and provision of a saliva sample, all of which can be done at home at the participant’s convenience.

To participate in the Australian Genetics of Depression Study please visit us online: www.geneticsofdepression.org.au or email mdd@qimrberghofer.edu.au

Genetics of Stuttering Study

The Genetics of Stuttering Study aims to pinpoint the genes that predispose individuals to stuttering, which could revolutionise future research into the causes, treatment and prevention of the disorder.

Participation involves completion of an online survey and provision of a saliva sample, all of which can be done at home at the participant’s convenience.

Australians who currently stutter, or have a history of stuttering, and wish to volunteer for the Genetics of Stuttering Study, please visit us online: www.geneticsofstutteringstudy.org.au or email geneticsofspeech@mcri.edu.au

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)