Researchers build nanorobots that stop cancer growth • Page 6

Melanoma Risk Predictor is live • Page 4

Attending to neglected tropical diseases • Page 10
A note from the Director

Welcome to another exciting edition of LIFELAB, our quarterly magazine. QIMR Berghofer Medical Research Institute continues to remain at the forefront of medical research breakthroughs and we are proud to share these recent research highlights with you.

In March, we launched our first online Melanoma Risk Predictor tool. At the time of writing we’ve seen 165 000 people from around the world complete the online test. The Melanoma Risk Predictor comes from extensive preliminary research from the QIMR Berghofer QSkin Study. What a remarkable achievement from everyone involved! Read more on page 4.

We acknowledge the dawning of a new era is upon us with microscopic nanorobots showing promising initial results at stopping the growth of cancerous tumours. This is a hugely exciting project where we have collaborated with National Centre for Nanoscience and Technology in Beijing. Read more on page 6.

Also in this edition of LIFELAB, we shine a light on the challenges of raising a family while pursuing medical research—as members of the Institute shared their thoughts at our International Women’s Day panel discussion. We endeavour to attract and support women wanting to make a career in scientific medical research. Read more on page 14.

As always, your substantial support of medical research is essential and greatly appreciated. We hope you enjoy reading the latest research highlights from the Institute.

Professor Frank Gannon
Director and CEO

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

CONTACT US
300 Herston Road
Herston QLD 4006 Australia
Locked Bag 2000
Royal Brisbane Hospital
QLD 4029 Australia
T 1800 993 000
F (07) 3362 0102
E supportus@qimrberghofer.edu.au
W www.qimrberghofer.edu.au

EDITOR
Paul Rees
General Manager, External Relations
E Paul.Rees@qimrberghofer.edu.au

A note on our packaging

Your LIFELAB Issue 98 was delivered in ‘EcoPure’™ 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.
Contents

4 Melanoma Risk Predictor is live. Check yourself now.

6 Researchers build nanorobots that stop cancer growth

8 One year in: Update on major Alzheimer’s study ‘PISA’

10 Attending to neglected tropical diseases

12 Why is virus-related arthritis worse in body extremities?

14 International Women’s Day at QIMR Berghofer

16 Q&A with Adele Green AC

18 Community

Cover Image
Nanorobots (not drawn to scale) target tumours through the blood vessel, stopping them from growing.

Illustration: Tal Bavli, QIMR Berghofer
QIMR Berghofer is a world-leader in skin cancer prevention—did you know that we’ve been researching melanoma for over 40 years! During this time, QIMR Berghofer scientists have helped to provide scientific evidence to support primary prevention, policy and education.

However, melanoma is still the fourth most common cancer in Australia—and is the deadliest type of skin cancer—and a shocking 1905 Australians are predicted to die from melanoma in 2018. Cancer Australia predicts that 14 320 new cases will be diagnosed nationally this year alone.

Thankfully, a research team at QIMR Berghofer Medical Research Institute, led by Professor David Whiteman and Dr Catherine Olsen, have developed an online test—aimed at people aged 40 years and over—to predict the risk of anyone developing melanoma over the next 3.5 years.

It calculates results based on seven risk factors for melanoma, including age, sex, ability to tan, number of moles at age 21, number of skin lesions treated, hair colour and sunscreen use. The risk predictor has been developed using data from nearly 42 000 people aged in their forties to seventies, who agreed to participate in the QIMR Berghofer QSkin study.

‘This online risk predictor will help identify those people with the highest likelihood of developing melanoma, so that they and their doctors can decide how to best manage their risk,’ Professor David Whiteman said.

‘Regular screening of those at highest risk may help to detect melanomas early and hopefully before the cancer has spread to the lower layers of the skin and other parts of the body,’ Professor Whiteman said.

Melanoma risk predictor is live.

One small spot can leave a huge mark on a family. Nearly 2000 Australians are predicted to die from melanoma this year alone. Discover your risk of melanoma with our online self-assessment tool.

To remind people to be sun safe at the beach, sand sculptors created a series of sandcastles gravestones at Surfers Paradise on the Gold Coast. It was a stark reminder of the dangers of melanoma.
The study found that people’s actual risk of melanoma was quite different to their own assessment, highlighting the importance of getting personalised advice on your predisposition to developing a melanoma. Since being released online, more than 165,000 people from around the world have completed the test. The team at QIMR Berghofer now plan to trial the online melanoma risk predictor among skin cancer doctors and their patients to test how it performs in the clinic.

To remind people to be sun safe at the beach, sand sculptors created a series of sandcastle gravestones at Surfers Paradise on the Gold Coast. It was a stark reminder of the dangers of melanoma, and helped us raise awareness of the importance of assessing your risk, and visiting health professionals to manage your risk.

QIMR Berghofer researchers were there on the day to discuss their research with members of the public. Several people took the opportunity to share their story of how melanoma had affected their lives, including several retired surf lifesavers.

A gentleman in a wheelchair approached our researchers and explained that he was a participant in an immunotherapy trial. He was full of praise for our efforts and the gravestone spectacle, emphasising how important it was to spread the word about how deadly melanoma is.

Professor Whiteman offers the following important advice to all Australians, ‘If you’re spending time outdoors this weekend, don’t become a statistic: remember to slip, slop, slap, seek and slide.’

Many will remember the Slip! Slop! Slap! campaign from the iconic and internationally recognised 1980s sun protection advertisement. More recently, the Cancer Council’s SunSmart message has expanded to include seek shade or shelter and slide on some sunnies, to round out the slogan to Slip! Slop! Slap! Seek! Slide!

‘Regular screening of those at highest risk may help to detect melanomas early and hopefully before the cancer has spread.’

-Professor David Whiteman

Check yourself now.

Discover your risk of developing melanoma with our online self-assessment tool today. Anyone can access the Melanoma Risk Predictor by visiting: www.qimrberghofer.edu.au/melanomariskpredictor.

‘Regular screening of those at highest risk may help to detect melanomas early and hopefully before the cancer has spread.’

-Professor David Whiteman

Check yourself now.
Medical advances are officially entering the 21st century. Our high standard of living in the developed world, combined with continuous technological advances, means we are now leading longer lives. So, is it too far-fetched to imagine a medical future where nanorobots march into our bodies to fight disease? Here at QIMR Berghofer Medical Research Institute, we know the future isn’t as far away as it sounds...

Scientists have successfully developed microscopic nanorobots—made of DNA and protein—that directly target tumours and stop them from growing. The nanorobots show early signs of success in pre-clinical trials.

The nanorobots successfully blocked the supply of blood to the tumour, starving it of nutrients and killing it. Testing has shown the targeted nanorobots are highly effective at reducing the growth and spread of breast cancer, melanoma and lung cancer.

The study is a collaborative effort, which involves a global team of research scientists from two medical research institutions.

Testing has shown the targeted nanorobots are highly effective at reducing the growth and spread of tumours with the characteristics of breast cancer and melanoma.

Professor Greg Anderson, Head of the Chronic Diseases Program at QIMR Berghofer in Brisbane, is involved with the project, which is being led by researchers from the National Centre for Nanoscience and Technology in Beijing.

Professor Anderson explains the nanorobots are crafted using a technique called ‘DNA origami’, where specially constructed sheets of DNA are folded up and bound together to form a tube-like structure 90 nanometres by 60 nanometres in size (pictured above).
He said the blood-clotting enzyme thrombin is then embedded within the nanorobots, which are represented by the two purple elements shown in the 3D image.

‘Thrombin is a naturally occurring protein that causes blood clots to form,’ Professor Anderson said.

‘This ability can be harnessed to kill tumour cells by developing a system where the thrombin only causes clots in the blood vessels that are feeding the tumour and not elsewhere in the body.

‘When that happens, the tumour cells no longer receive essential nutrients and they die. That’s why this is such a clever delivery method.’

This highly-innovative nanomedicine venture shows the direction of The Future of Health.

‘Using this DNA origami approach potentially provides a new method that could be used to help achieve the ultimate goal of eradicating primary tumours and their metastases,’ he said.

‘It shows just what is possible with contemporary biomedical technology and hints at what may be the future of intelligent drug delivery.’

Professor Guangjun Nie, from the National Centre for Nanoscience and Technology in Beijing, said:

‘Through accurately controlling the dose of nanorobots, we should be able to improve their tumour-targeting efficacy while minimising side effects. We have moved to the pre-clinical trial stage now and we hope to finish all pre-clinical studies over the next few years.’

For further reading, the study is published in the February 2018 edition of scientific journal Nature Biotechnology.

‘It shows just what is possible with contemporary biomedical technology and hints at what may be the future of intelligent drug delivery.’

~Professor Greg Anderson

Image source: Arizona State University.
Professor Michael Breakspear, Dr Christine Guo and Professor Nick Martin are now partway through the five-year Prospective Imaging Study of Ageing (PISA) project. They have already registered about 60 participants to complete the initial sequence of testing.

Participants in the study are currently taking part in cognitive and genetic tests, magnetic resonance imaging (MRI) and positron emission tomography (PET) imaging to help pinpoint the markers that might be indicators of developing the disease.

The study includes a new imaging module, which tests the memories of participants as they view a series of news clippings. Previously, traditional approaches required participants to memorise and recall very abstract pieces of information or isolated words and faces.

‘The results from the news viewing experiments are really encouraging,’ Dr Guo said.

‘We’ve found the rich emotional and natural flavour of the news clips evokes the memory processes more robustly than traditional tasks used to study memory in the MRI scanner.

‘Our hope is this will allow us to more effectively capture the subtle memory deficits of someone who is in the very earliest stages of Alzheimer’s disease,’ she said.

Bronwyn Ferrier, 65, is a participant in the study and has completed the first round of MRI and PET scans, plus the memory and cognitive skills tests last year.

‘I did really well at the news snippets testing in the MRI session. I scored quite high on that, having high recall, probably because I’m a bit of a news buff,’ Bronwyn said.
Bronwyn describes other elements of the testing involved: recalling names of a spoken list of 20 objects; reading names of colours written in a different colour; and finishing sentences with one word that has no relevance to the sentence, to determine how responsive the brain is to swapping thought processes.

‘At first, I was really concerned with getting the right answer, but then they explained that it’s all personal testing and that my own baseline results will be used to see if there’s any degeneration in about five years’ time,’ Bronwyn said.

The overall objective of the five-year study is to develop an algorithm that will enable early detection of Alzheimer’s disease—identifying people who are at a higher risk of developing the disease while they are still young and healthy.

‘While the burden of dementia in Australia occurs late in life, it’s likely that the underlying brain disease starts decades prior to the first symptoms,’ Professor Breakspear said.

Bronwyn, living on the Gold Coast, remembers that she really had to deliberate before signing up to participate in the Brisbane-based study.

‘Then I thought, they need healthy people to get involved in medical research, and I’ve had close contact with my husband’s mother having Alzheimer’s, which was a very difficult time, so I feel proud to do my little bit.’

Alzheimer’s disease remains an enormous burden on Australian society, with devastating consequences for everyone involved—those living with it, as well as their families and carers. There is nothing more heart breaking than a loved one forgetting who you are, how you fit into their life and the memories you created together.

‘With growing effort being made in preventative programs, early intervention will allow us to identify at-risk individuals and start working with them sooner to delay the disease,’ Dr Guo said.

‘We want to develop ways to identify those people at the very earliest stage of the disease, before permanent and often irreversible damage to the brain takes place,’ Professor Breakspear said.

‘We’ve found the rich emotional and natural flavour of the news clips evokes the memory processes more robustly than traditional tasks used to study memory in the MRI scanner.’

-Dr Christine Guo
Neglected tropical diseases (NTDs)—including parasitic, intestinal worm infections—are a significant global health problem. Many of those at risk of infection are children, who are susceptible to suffering from long-term effects of malnutrition caused in part by parasite infection.

QIMR Berghofer’s Professor Don McManus, has devoted his life’s work to solving NTDs. His main areas of research are schistosomiasis and soil-transmitted helminths (STH).

Schistosomiasis is an acute and chronic parasitic intestinal flatworm disease caused by blood flukes—Schistosoma spp. It is spread by freshwater snails commonly found in rural farming areas, infecting children and adults as a result of interaction with water contaminated with the infectious schistosome parasite’s larvae, by either playing, washing, farming or fishing. STH are primarily transmitted by poor hygiene practices and poor access to clean water and toilets.

Schistosomiasis and STH are a public health issue in Asia, Africa and South America. Around 700 million people, in more than 70 countries, live in areas where the Schistosoma parasites are common, while it is estimated that two billion people are infected with STH.

Professor McManus and his team are actively engaged in rolling out a multi-pronged approach in China to combat the disease through prevention programs, diagnostic tests and treatment methods including chemotherapy and vaccine development.

### Prevention

To address prevention, the QIMR Berghofer team collaborated with Australian National University and the University of Queensland to create an animated cartoon video called The Magic Glasses. It teaches children about good hygiene to prevent infection with STH.

The video can be viewed here: [www.qimrberghofer.edu.au/magic-glasses](http://www.qimrberghofer.edu.au/magic-glasses)

The video is in Mandarin and is aimed at Chinese school-aged children. A trial completed in 40 schools in the Hunan province has shown remarkable results. Schoolchildren who viewed the video have a much better understanding and knowledge of the parasitic worms; increased their handwashing hygiene to almost 100 per cent; and have half the reinfection rate of children from other schools—which is unprecedented.

Since then, the researchers have rolled out the trial to the Philippines and Vietnam, with a view to continue into Myanmar and Africa.

Building on the success of this prevention program, Professor McManus now requires funding to make a separate video about preventing schistosomiasis. However, education on its own is not going to solve the endemic problem.
Diagnostic tests & treatment methods

The current World Health Organisation-approved diagnostic method for monitoring intestinal worm infections is the Kato-Katz (KK) method, which involves examining faecal matter for eggs under a microscope. However, the test is not always accurate, particularly when the infection is in the early stages, or when a person has received recent treatment for an infection.

In a novel approach to identifying infected individuals, Professor McManus and his team have developed a more accurate means of testing for schistosome worm infections by using a small amount of blood obtained with a finger-prick blood test, similar to the method used for diabetes sufferers to test their blood sugar levels.

“There is no need to treat everybody. Whereas, here, we can test and treat only the individuals that need treating, thus saving international aid,” he said.

“The beauty of the test is that it can help identify individuals with a recent infection, so if we can identify those individuals early and treat them earlier, management of the disease would be more effective.

“The blood test would also help monitor a control program over time to determine whether treatment and other control interventions have been effective in eliminating the disease.

“We believe it will be relatively inexpensive and can be easily implemented in remote and relatively poorly equipped laboratories,” Professor McManus said.

Diagnostic test needs funding

Professor McManus is passionate about collaborating with a commercial partner or philanthropic organisation that is interested to commercialise this diagnostic blood test and distribute it to the world.

“We can use the diagnostic test and the health education video package on a global scale to safeguard millions of people who are living in endemic areas and are likely to be infected with schistosomes,” he said.
Arthritis is debilitating. Suffers experience chronic pain, stiffness and inflammation of the joints, where currently 3.85 million Australians are affected by the disease and these symptoms.

Arthritis is often thought of as a disease of aging, but did you know mosquito-borne viruses, such as Ross River virus and chikungunya virus, can cause the disease in people of all ages? And this is precisely one of the areas of interest for scientists working in the Infectious Disease Program at QIMR Berghofer Medical Research Institute.

A recent preclinical study has discovered that arthritis caused by mosquito-borne viruses is worse in the limbs, hands and feet than the rest of the body, because of their usually cooler temperature.

Professor Andreas Suhrbier and his team of researchers, in the Inflammation Biology laboratory, made the discovery while looking into how the immune system combats arthritic joint inflammation caused by Ross River virus and chikungunya virus.

Professor Suhrbier said arthritis from mosquito-borne viruses usually affects joints in the limbs, such as the arms, wrists, legs, ankles and feet, with symptoms lasting from weeks to many months.

‘We’ve now worked out why these joints are so badly affected by inflammation. The bizarrely simple answer is, because these joints in the limbs are usually a few degrees cooler than the rest of the body,’ Professor Suhrbier said.

The first line of defence used by the body to fight off a viral infection is cell proteins called type 1 interferon.

‘What we have discovered is that interferons work optimally at 37 °C, which is the body’s normal temperature. However, we found that when the temperature is a few degrees cooler, this defence system works very poorly,’ Professor Suhrbier said.
This revolutionary piece of research is the first time that ambient temperature has been shown to have such a dramatic effect on viral infections in warm-blooded animals.

‘The recent large global epidemic of chikungunya virus has so far only affected Australian travellers, but it has caused millions of cases across Africa, Asia and the Americas.’

—Professor Andreas Suhrbier

The finding perhaps offers some vindication to the limb-warming treatment that was pioneered by Sister Kenny (an Australian nurse) in the 1930s for treating polio victims.

Professor Suhrbier said heat treatment for Ross River virus or chikungunya virus would likely need to start very early in infection, with human studies needed to determine precisely how effective this treatment could be for sufferers.

Every year, between 4000 and 5000 Australians develop Ross River virus disease, also known as Ross River fever, and a recent global epidemic of chikungunya virus has caused many millions of cases across Africa, Asia and the Americas.

The study is a global collaborative effort, including research scientists from QIMR Berghofer, the University of Queensland and Griffith University in Brisbane; the National Institute of Infectious Diseases in Japan; the School of Pharmaceutical Sciences in Brazil; and the University of Pittsburgh in the United States.

\[\text{BODY EXTREMITIES RUNNING AT COOLER TEMPERATURES.}\]

SUNSCREEN SUMMIT 2018

QIMR Berghofer hosted the inaugural Sunscreen Summit on 19–20 March 2018. The most influential people in the field attended the invitation-only, two-day event, convened by the Australian Skin and Skin Cancer Centre (ASSC).

The Summit included presentations and workshops on key topics such as: sunscreen testing and formulations; Australian and international sunscreen policies; the effectiveness of sunscreen; results from molecular studies of how sunscreen affects humans; and barriers to sunscreen use, such as sunscreen regulations, sunscreen in social media and consumer concerns about sunscreen.

The Sunscreen Summit was timely, with new research released by Cancer Council Australia announcing that one in nine Australians don’t know when they need sun protection.

‘Ultraviolet radiation from sunlight is the main environmental cause of melanoma, with researchers estimating that it causes anywhere between 63 per cent and 90 per cent of all melanoma cases,’ Professor David Whiteman said.

We hope that by bringing together Australia’s best and brightest sunscreen experts, we can continue to help inform new strategies to educate Australians about sunscreen’s role in sun protection, and improve everyone’s understanding of how to prevent skin cancer.

\[\text{PICTURED ABOVE: PROFESSOR DAVID WHITEMAN AND DR RACHEL NEALE (BOTTOM LEFT), ORGANISERS OF THE SUMMIT WITH PRESENTERS AND ATTENDEES AT QIMR BERGHOFER.}\]
QIMR Berghofer supports International Women’s Day

This year, all QIMR Berghofer staff were invited to a discussion panel event to commemorate International Women’s Day.

Did you know that about 62 per cent of QIMR Berghofer researchers are female? To commemorate International Women’s Day, all staff were invited to a discussion panel event on Thursday 8 March 2018.

The panellists comprised Chief Operating Officer Donna Hancock, Deputy Director David Whiteman, Group Leader Georgia Chenevix-Trench, Group Leader Kelli MacDonald, Senior Research Officer Katia Nones, PhD Student Vaishnavi Nathan, and was adjudicated by Siobhan Barry.

The panel discussed the challenges facing women who choose to work in full-time, intensive roles, such as science and business: raising a family, support, and mentors. Some of the key points expressed on the day are below.

**Donna Hancock, Chief Operating Officer:**
‘As women we always need to continue to keep putting ourselves and our ideas forward. Be true to yourself and maintain your integrity. There is a generational change assisting this process. It’s as important for business professionals as it is for scientists, to build a transportability of skills in your work portfolio and find mentors who will assist you on the journey.’

**Professor David Whiteman, Senior Scientist, Cancer Control Group:** ‘All of my best role models have been talented and capable women. They’ve provided me with invaluable mentorship and inspiration. Honestly, a lot of my success can be attributed to working with great women.’

**Katia Nones, Senior Research Officer, Medical Genomics:** ‘I have a 21-month-old and I’ve found if you love what you do and you work hard, you will work around it... Don’t forget to stop and reassess your current situation from time to time. If you like what you do, you’ll find a way.’

**Vaishnavi Nathan, PhD Student, Oncogenomics:** ‘When you’re surrounded by such successful women who are doing it all—juggling a family and a career—you can’t help feel optimistic and motivated to overcome any challenges that we may face now and in the future.’

Director and CEO Frank Gannon closed the event with these final words:

‘Equity and fairness are of utmost importance at QIMR Berghofer. Everyone has the right to progress but no one else can define success for you.’

-Professor Frank Gannon

---

The panellists from left to right: Donna Hancock, Professor Georgia Chenevix-Trench, Professor David Whiteman, Siobhan Barry, Katia Nones, Vaishnavi Nathan and Dr Kelli MacDonald.
Maureen Stevenson is shaping The Future of Health. Maureen is a long-term supporter of QIMR Berghofer and last December she was presented with a Clive Berghofer Humanitarian Award.

Maureen Stevenson is shaping The Future of Health. A long-term supporter of QIMR Berghofer, Maureen was presented with a Clive Berghofer Humanitarian Award in December 2017 recognising her generous support over the years.

Maureen and her late-husband, Barry, have been committed supporters of QIMR Berghofer for longer than many of our staff have been employed here! Together they have supported the Institute since 2002, becoming official Ambassadors in 2007. Sadly, Barry passed away in 2015 but Maureen’s support has continued in Barry’s memory.

PHD STUDENT SCHOLARSHIP

Maureen’s vision and passion to support the future of health has led to her decision to sponsor two PhD scholarships at the Institute, assisting the next generation of researchers make progress into breast cancer research.

1. The Maureen Stevenson Scholarship—supporting a PhD student working to identify new risk genes for oestrogen receptor negative breast cancer. This project will identify new genes, that when altered, contribute to the development of oestrogen-receptive breast cancer potentially revealing entirely new avenues for the prevention and treatment of breast cancer.

2. The Maureen and Barry Stevenson Scholarship—supporting a PhD student working on the role of neutrophils in cancer immunotherapy and metastatic progression. This project hopes to unravel the relevance of certain signalling in neutrophils, as a reaction to different immunotherapies, in the hope of improving the survival of cancer patients.

QIMR Berghofer offers donors who sponsor a PhD scholarship the opportunity to name the scholarship and enables them to have a direct connection with the scientists and their research findings as they progress.

GIFT-IN-WILL BEQUEST

In addition to two PHD scholarships, Maureen has committed to leave a Gift-in-Will Bequest to QIMR Berghofer, which will have a significant impact on the longevity of medical research projects embarked on by QIMR Berghofer into the future. Maureen’s bequest will keep scientific medical research alive.

Donors who inform us that they have included QIMR Berghofer in their Will are welcomed to our Bancroft Society, a special membership recognising their generosity now and providing valuable legacy into the future.

Maureen, we thank you for your continuous and generous support over the years, and we are honoured that you feel inspired to invest in the future of medical research in Queensland.
What is your area of research and can you tell us about your current projects?

My research area is epidemiology and these days I study mostly the causes and prevention of melanoma and other skin cancers. My overall goal is to prevent cancer developing or progressing. One current project involves people diagnosed with a melanoma that is at high risk of spreading even after it’s been excised. We want to find out how personal factors like age, outdoor habits, diet, stress levels, affect the risk of their melanoma spreading. Another big project focusses on how to reduce the enormous skin cancer burden that people who have organ transplants suffer, because their immunosuppression makes them especially vulnerable and in need of extra care.

How did you end up in science?

I firstly pursued clinical medicine but found it frustrating in hospital clinics when my advice and prescribing of drugs seemed to have no tangible benefit among many of my patients who smoked or were overweight. So I took a break to do a PhD in public health/epidemiology since as a medical student I had enjoyed a holiday job in the University of Queensland’s Social and Preventive Medicine department. This research was so rewarding that after a brief stint in clinical medicine post-PhD, I returned to research full time and have never regretted it.

In 2013 you received many awards, including Queensland Australian of the Year. What has been your career highlight to date?

I think the highlight was the randomised controlled trial of daily sunscreen use and beta-carotene supplementation that we conducted in the community of Nambour (100km north of Brisbane) in 1992–1996 with a decade of follow-up, completing in 2007. We showed that squamous cell cancer of the skin and melanoma are preventable by everyday sunscreen use in Queensland and similarly that regular sunscreen use reduces actinic keratoses (‘sun spots’) and premature skin ageing.

What was the biggest obstacle you faced with your research, and how did you overcome it?

There are some people in the community who decline to take part in research studies. The reasons are often understandable—they may be elderly, in poor health or battling with stress or lack of time. Some feel they have nothing to offer and others simply aren’t interested. This is a big obstacle as the play of factors leading to disease may be quite different in these ‘non-responders’—when compared with healthy, highly-motivated respondents—meaning that our findings may not apply to everyone (including people who might benefit most). I’m sorry to say that we have not overcome this obstacle. Thirty years ago, 70%–80% of the general community would agree to take part in a research study if invited; today it is around 20 per cent.

What advice do you have for women wanting to succeed in the scientific research industry?

Be fully committed to your work and enjoy it, be super-organised, choose a supportive partner and look on inevitable set-backs along the way as challenges to be overcome.
You spent time overseas at the prestigious London School of Hygiene & Tropical Medicine. What experience did you gain during your time there?

Perspective! So many fine minds there and from all over the world, working on diverse health problems with unequal resources, made me question my assumptions and understanding of health and disease. To the present day I have tried to stay mindful of the extremes of circumstance in this world and how this relates directly to human health and wellbeing.

What do you like about working at QIMR Berghofer?

There is an understanding that everyone shares the same endgame—we all are working to improve health through excellent medical research. Whether one is an established researcher, working in research support or a student at QIMR Berghofer, the great respect for medical research as the common, higher purpose is an invaluable source of encouragement. It is a privilege to work here.

You were recently appointed to lead the newly-formed Australian Brain Cancer Mission Strategic Advisory Group with Cancer Australia. What does it mean to you personally to be able to provide strategic advice as a leader in your field in this role?

I see my role as a facilitator, helping to bring to fruition the Mission’s highly ambitious goal of doubling the survival rate of people with brain cancer over the next 10 years and improving their quality of life after diagnosis with new funds from government and other sectors like industry and philanthropy. The Strategic Advisory Group brings to the same table experts and community members with professional and personal experience respectively. I greatly look forward to seeing synergy emerge among the group such that we can provide intelligent advice and suggest innovative strategies to Cancer Australia to achieve the Mission’s goals.

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

In the working week I find bushwalking on Mt Coot-tha is a great way to enjoy physical activity and the natural beauty of the forest, and do some blue-sky thinking at the same time.

Deputy Director David Whiteman mentioned that you were a mentor to him and his current work—melanoma research. How do you feel about passing on your learnings, and being a mentor to professionals in your field?

I count such experiences as mentoring people like David and other professionals, and supervising my research students, as some of the most fulfilling aspects of my career. In the chain of research, I am conscious of those who have paved the way by providing insights and inspiration, and I in turn have tried to share their legacy and build on it in a small way by passing on some of my own professional observations and experiences.

‘...the great respect for medical research as the common, higher purpose is an invaluable source of encouragement. It is a privilege to work here.’

-Professor Adele Green

Adele Green in her office at QIMR Berghofer in 2011
Night at the Races

St John’s College in Nambour held their third annual race evening at Corbould Park Racecourse on Friday 23 March 2018, with all proceeds from this fundraising event donated to QIMR Berghofer. They decided to fundraise for us this year, because cancer has again struck their school community and they felt it was important for the wider community to come together and try to help make a difference. Their community sadly lost a beautiful student to cancer last year and there are a number of staff, students and their families currently battling through this insidious disease. Lochlan Fennel, one of QIMR Berghofer’s student researchers, presented at the event—speaking about his research into bowel cancer. The event raised $6400 for medical research.

Girl’s Pink Night Out

The residents of Caloundra Rise Retirement Village held a Girl’s Pink Night Out for Cancer Research on Monday 9 October 2017. Imagine around 100 people all dressed in pink, with a spot of live music playing—and yes, even some men got involved in the Girl’s Pink Night Out! This was Caloundra Rise’s first fundraising event for QIMR Berghofer. The enthusiastic and dedicated group of organisers held raffles, auctions and a trivia competition—raising a generous total of $3132 to go towards cancer research. Their fundraising effort originated from the collective thought that they each may have been touched by cancer at some point, and they wanted it gone. The researchers at QIMR Berghofer thank you for your inspirational spirit.

Barefoot Bowling for Brain Cancer

Wendy and Peter Powell became motivated to fundraise for QIMR Berghofer when they lost their son, Lincoln, to brain cancer in October 2016. In his memory, Lincoln’s local bowls club—the Bramble Bay Bowls Club at Clontarf—has agreed to dedicate every third Sunday in February as a fundraising day, calling it the Lincoln Powell Memorial Day on the Green. Lincoln’s family intends for this day to be a recurring event with all proceeds donated to QIMR Berghofer for medical research. This February, the club raised a gallant $4709. We thank you for your ongoing support and we look forward to attending next year.
World Science Festival

World Science Festival Brisbane is an annual celebration of science, technology, engineering, maths and the arts. QIMR Berghofer Medical Research Institute was an official program partner of the World Science Festival Brisbane. Throughout March, the festival visited Brisbane, Gladstone, Chinchilla, Toowoomba and Townsville.

The Brisbane Street Science! precinct was the pinnacle of the festival, being open to the public on the weekend of 24–25 March at the South Bank Cultural Precinct.

The QIMR Berghofer tent featured working microscopes, carnival cut-outs for photo opportunities and incredible medical illustrations. Young children received UV bracelets and had the chance to colour a human body wheel.

Furthermore, the festival's regional program provided Queenslanders—especially those living outside the southeast corner—the opportunity to get involved by joining in discussions with leading scientists, workshops, hands-on activities and visual displays.

QIMR Berghofer's Director and CEO, Professor Frank Gannon, said the Institute was proud to help bring the wonders of science to communities outside of Brisbane.

QIMR Berghofer’s Dr Nigel Waterhouse, Senior Microscopist & Cell Biologist, talked about the tiny worlds that come to life under his microscope as he discussed his amazing job.

‘This is a wonderful opportunity for our amazing researchers and scientists to share their expertise and passion for science with all Queenslanders.’

-Professor Frank Gannon

Dr Waterhouse said he enjoyed explaining how modern microscopes help reveal the complex and fascinating world of tiny cells that make up the human body.

‘Being a microscopist in medical research is a bit like being an astronomer who explores deep space,’ he said.

‘Instead of looking at the stars, we use lenses and light to look at the trillions of tiny cells in the body to understand what they do, what happens if something is wrong and how we might fix any problems.’
Immunotherapy is fast becoming the fourth pillar of cancer treatment.

How your immune system works

- **White blood cells** are made in your **bone marrow**. Because some white blood cells have a short lifespan (1-3 days), your bone marrow is constantly making more.

- **Your tonsils** make antibodies, which fight bacteria and viruses.

- Your **spleen** filters your blood and stores many white blood cells, which destroy bacteria.

- **Your lymph nodes** filter out pathogens and cancerous cells.

- **Your tonsils** make antibodies, which fight bacteria and viruses.

How does immunotherapy work?

1. **A type of white blood cell, known as a T cell, is extracted from a blood sample.**
2. Our scientists then grow and enhance the T cells in the laboratory.
3. The T cells are then infused back into the patient to fight cancer and other diseases.

Learn more about QIMR Berghofer’s world-leading role in this field.

qimrberghofer.edu.au/immunotherapy