World-first brain cancer trials

QIMR Berghofer scientists have used patients’ own immune systems to make a major breakthrough in the treatment of the aggressive brain cancer Glioblastoma Multiforme (GBM).

The study built on previous research which found that many brain tumours carry cytomegalovirus (CMV). About half of all Australians have the virus, but usually show no symptoms.

Professor Rajiv Khanna developed a technique to modify the patients’ T-cells in the laboratory, effectively “train” them to attack the virus, and then return them to the patient’s body. When the killer T-cells destroyed the virus, they also destroyed the cancer.

Most of the study participants lived much longer than the six-month prognosis normally given to a patient with recurrent GBM, and some patients showed no signs of disease progression.

“It is early days, but this is exciting,” Professor Khanna said.

“Survival rates for this aggressive cancer have barely changed in decades. There is an urgent clinical need for new treatments.

“If this treatment can buy patients more time, then that is a big step forward.

“It’s becoming increasingly clear that immunotherapy - manipulating a person’s own immune system – is a rich new frontier for cancer treatment.”

GBM is the most common malignant brain cancer, diagnosed in about 800 Australians every year. Despite surgery, radiotherapy and chemotherapy, less than 10% of patients survive beyond five years.

The Phase I trials were conducted at Brisbane’s Wesley Hospital, under the leadership of neurosurgeon Professor David Walker.

“Working with patients with malignant brain tumours can be distressing, because we know so many will succumb,” Professor Walker said.

“But this new branch of therapy lets us offer some hope that the future is going to be brighter, that new and innovative treatments mean things will hopefully improve in the future.

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FROM THE Director

Every day at QIMR Berghofer we’re producing work of scientific excellence with the power to transform all our lives. So it was enormously satisfying to see the Federal Government’s recent, emphatic declaration about the importance of medical research to Australia’s future health and prosperity.

The new proposed Medical Research Future Fund will undoubtedly provide much-needed certainty to the sector. However, I must stress that your continued support for our work and our scientists remains vital, and that your involvement helps establish our priorities, shape our research, and drive our work.

The creation of the Future Fund is dependent on the successful passage of legislation through parliament. At the time of going to press, this was still a work in progress. If successful it will be established in January 2015 with funds available 2015-16.

These funds will increase in a measured way, over time, and are dependent on external influences, for example, it is anticipated that the doubling of funds for medical research will not happen until 2023. The criteria have not yet been defined and until they are we cannot be certain that all activities in our three research programs will be eligible for support.

So, while we are excited by the opportunities ahead, we hope our partnership with you in our journey towards better health, will continue with strength.

Certainly, our research is flourishing, as you’ll see from the sampling of recent findings in this edition. Many of these studies would simply not have been possible without your support. I should point out that there are many, varied ways you can contribute to our knowledge, including by volunteering to take part in our studies.

And finally, it wouldn’t be a Lifelab without a new Professor Adele Green accomplishment to applaud! In addition to her recent string of achievements – Queensland Australian of the Year, Winner of the AFR/Westpac 100 Women of Influence Awards – our acclaimed skin cancer researcher has now been officially proclaimed a Queensland Great. Premier Campbell Newman made the announcement to launch Queensland Week. This is one of the most prestigious accolades the State can bestow and recognises people who’ve made a lasting, positive difference to Queensland.

Adele Green could not be more deserving.

Professor Frank Gannon
Director and CEO - QIMR Berghofer
“We have a long way to go, and there is hard work to be done, but we seem to be on the right track, and it is a pleasure to work with scientists at QIMR Berghofer to try to make a real difference.”

The research team is now keen to begin the next phase of trials, involving patients at an earlier stage of the cancer’s development.

“These would be patients who have just been diagnosed and are about to start the standard treatments — surgery, then radiotherapy or chemotherapy. We would generate the T-cell therapy before their standard treatment, and then administer T-cells in conjunction with the standard therapy,” Professor Khanna said.

“We hope that the treatment can be even more effective if given at an earlier stage of the disease.”

This research was published in the prestigious US journal Cancer Research, May 2014.

Yet again, we have been overwhelmed by the support for the Rio Tinto Ride to Conquer Cancer

Over the weekend of August 16 and 17 an amazing 1,124 participants including our very own QIMR Berghofer team, rode over 200 kilometres in the fourth annual Rio Tinto Ride to Conquer Cancer. An outstanding $3.8 million was raised to support cancer research programs at QIMR Berghofer.

The Ride is Queensland’s largest fundraising event series, and in four years has raised almost $18 million for QIMR Berghofer.

Our most grateful thanks and appreciation is extended to every rider and volunteer who took part to make this Ride such a success.
QIMR Berghofer has taken delivery of state-of-the-art imaging equipment, thanks to a funding injection of $2.6 million from the Australian Cancer Research Foundation (ACRF).

The laser scanning confocal microscope is a key, first piece of equipment in the Institute’s new ACRF Centre for Comprehensive Biomedical Imaging. QIMR Berghofer Director, Professor Frank Gannon, said the Centre would further empower world class cancer researchers.

“Imaging equipment of this sensitivity has transformed our ability to understand cancer because it allows us to see biological processes at each step, from basic discovery through to clinical application,” Professor Gannon said.

“The ACRF Centre for Comprehensive Biomedical Imaging, combined with QIMR Berghofer’s renowned cancer researchers, will be the genesis for new scientific discovery which will enrich cancer based discovery worldwide,” he said.

The laser scanning confocal microscope provides high resolution images of cancer at the molecular level. To ensure the best images, QIMR Berghofer has installed an anti-vibration table which weighs almost one tonne and is suspended on legs controlled by pressurised air.

“Hector the Erector” has played a show-stopping role in the future of clinical imaging in Queensland.

On a winter weekend in June, the giant crane delivered three of the world’s most sophisticated medical scanners into the opened roof of the new Herston Imaging Research Facility (HIRF).

The $12 million cutting-edge scanners will revolutionise research into the treatment of cancer, dementia and mental illness.

HIRF is a joint project of QIMR Berghofer, The University of Queensland, Queensland University of Technology and Metro North Hospital and Health Service, through The Royal Brisbane and Women’s Hospital. The research facility will be opened in the coming months.
In a major breakthrough for cancer treatments, a QIMR Berghofer scientist, Professor Mark Smyth and his team have discovered that a key protein on the surface of immune cells helps to camouflage cancer, offering a new treatment target.

Principal investigator, Professor Mark Smyth, has shown that the CD96 protein prevents the body’s natural immune cells from responding to cues from cancer cells.

“There is still much more to learn, and CD96’s exact function in other diseases to be defined. But it’s now clear that it has an important role to play in cancer’s development, and our work is taking us in exciting directions.”

“It’s every day, our bodies fight off cancer, because our natural killer cells – or NKs – instantly recognise cancer cells as alien, and destroy them,” Professor Smyth said.

“But we’ve discovered that NKs have the CD96 protein on their surface, and this protein stops NKs from being overactivated. Essentially, the cancer hijacks this process to prevent immune recognition and activation, allowing the cancer to spread through the body.”

“What this discovery provides us with is a clear path for new treatments for advanced cancers, because we can develop an antibody to block CD96, now that we know it is an immune checkpoint inhibitor.

“CD96 could potentially be used to treat some of the most deadly forms of cancer including advanced metastatic cancers.”

Immune checkpoint inhibitors are regarded as the most exciting advances in cancer treatments in decades, showing remarkable results in trials across the world.

“Our next, crucial step is to test CD96’s role in human cells and we’d hope to have those results later this year. If all goes to plan, and I must say it is looking promising, we can take the next steps towards human trials,” Professor Smyth said.

Anorexia nervosa genes

The Anorexia Nervosa Genetics Initiative (ANGI) is now calling for former and current sufferers of anorexia nervosa to take part in a brief survey and donate a blood sample. QIMR Berghofer is hoping for volunteers from across Australia and New Zealand.

“They can make a real difference to our understanding of the condition, which will, in turn, help other patients,” said Professor Nick Martin, Head of QIMR Berghofer’s Genetic Epidemiology group.

Volunteers complete a 30 minute online questionnaire and, if eligible, provide a blood sample. Sample collection kits can be mailed anywhere in Australia in New Zealand. All delivery and collection costs are covered and all information remains confidential.

To find out more about ANGI, visit https://angi.qimr.edu.au or free phone 1800 257 179.
Asbestos, the silent assassin

For generations, thousands of Australian families were exposed to asbestos.

Many would return home covered in asbestos dust, as part of their daily toil. Their families were also exposed, from giving their dad a hug when he arrived home, or washing his dust-covered clothes.

Sadly, by the time the dangers of asbestos became known, thousands of Australians had already been exposed to its deadly toxins. We know now that even a small exposure can lead to an incurable cancer known as mesothelioma.

Maree remembers: “The doctor gave the diagnosis, and told us he had about 12 months to live—just like that, 12 months. It was shocking.”

While Eddie survived a few more years, tragically, shortly after he passed away, his sister, Beverly, was diagnosed with mesothelioma. She died five years later. They are painful memories for Maree: “It is an awful death. This thick fluid builds up in their lungs, the fluid keeps building and so does the pressure.”

Mesothelioma is cancer of the mesothelium—the sack that lines many of the body’s internal organs. It typically forms on the inside of the chest wall, where it continues to grow and slowly suffocate its victim by surrounding, compressing and ultimately “strangling” the lungs.

QIMR Berghofer researcher, Associate Professor David Reid, has prepared a study which aims to identify what the risk factors are for developing the disease, and new treatments that could potentially improve survival and possibly even lead to prevention.

The research team have laid groundwork to investigate how the body reacts to the iron, which may hold the key to understanding why some people develop cancer from exposure to asbestos, while others seem to be unharmed. The team want to be able to understand what genetic factors increase the risk of developing mesothelioma, and believe understanding these could potentially lead to screening programs and the ability to intervene before the cancer develops.

The work of Associate Professor Reid and his team are a typical example of the kinds of vital research QIMR Berghofer are constantly seeking to secure funding for.

Thousands of Australians have died from mesothelioma so far. Without a cure, it’s estimated that at least a further 25,000 could die in the next 25 years. With a 20 to 40 year delay between exposure and the onset of mesothelioma, what we don’t know is just how many people will be affected.
Mother and grandmother, Edris Solley, explains why she has arranged to leave a gift to QIMR Berghofer in her Will.

“I lost my husband 19 years ago to prostate cancer. He was just 56 years old. He might have lived if he’d had the cancer diagnosed earlier. They could have started treatment earlier, maybe in time to save him.

Edris would like to see fewer people losing loved ones to preventable diseases. That’s why she has arranged to remember QIMR Berghofer with a gift in her Will.

“Now I have two sons – and eight beautiful grandsons. I dread the thought of any of them being affected by prostate cancer. That’s why I’ve arranged to leave a gift in my Will to QIMR Berghofer. It will support research that is finding ways of diagnosing and treating cancer earlier.

I know research works. I survived lymphoma myself. And I’m certain that I owe the last seven years of my life, since I beat the disease, to breakthroughs in treatment that were made possible by research.

As I get older, I see friends who aren’t so lucky with their health. Some of them are beginning to struggle with dementia. This is one of many areas of research that my bequest will help to fund when I’m gone.

I think anyone who has been touched by an illness – mental or physical – should think about supporting QIMR Berghofer too.”

With Edris’ help, we’ll be able to fund more essential research in years to come.

Leaving a gift in your Will is as easy as picking up the phone or ticking the box on the reply form opposite.

By arranging to leave us a bequest, and telling us about it now, you won’t just be funding crucial research projects tomorrow, you’ll also help us to plan all our work today with more confidence and accuracy.

If you would like to discuss any aspect of how you can help fund our future work by leaving us a bequest, please get in touch by calling our Donor Liaison Officers Ann McGaw on 07 3362 0220 or Joan Stockman on 07 3362 0251.

Whatever you discuss will be in the strictest confidence, and you won’t be under any obligation.
QIMR Berghofer runs regular, free public tours. The next tours are:

- **September 30**
- **October 28**

You can also arrange a private tour of QIMR Berghofer for your community group. **Bookings are ESSENTIAL:** please ring free call 1800 993 000.

**SPECIAL THANKS**

We were recently delighted to welcome visitors Clarissa Rayward and Trent Waller from the Brisbane Family Law Centre, the Redland Breast Cancer Support Group and Mrs Lorraine Duckwitz, who each presented cheques to researchers: Professor Adele Green, Adrian Wiegmans and Dr Nicole Cloonan respectively, in support of their work.

A special thanks also to the Mermaid Beach Bowls Club Sewing Group who have generously donated another, beautiful, handmade quilt to QIMR Berghofer. Each year the members painstakingly patchwork an amazing finished piece for the Toowoomba Women’s Golf Club to raffle at their breast cancer fundraiser in October.

**SAVE THE DATE:**

**Open for visitors!**

QIMR Berghofer is going on show again as part of the 2014 Brisbane Open House scheme.

Come for a tour of our state-of-the-art laboratories, and hear about the local history behind the huge art wall, *water memory*. There will also be activities for children.

We’ll be opening the doors from 10am-2pm on Sunday 12 October.

For more information visit the Brisbane Open House website www.brisbaneopenhouse.com.au