A matter of repair

By understanding a rare disease, QIMR researchers are unlocking the answers to cancer and brain repair.

“They are so cheeky and get away with as much as they can,” said Sally Leeworthy, a loving mother of four.

The young Mum laughs as she talks about her children, but her expression changes as she explains about the disease that is predicted to claim two of them before their 25th birthday.

Marie and Jarrah have ataxia-telangiectasia (A-T), a rare, hereditary disease that affects many parts of the body.

“Jarrah, now eight, was diagnosed at two years old. He would be in and out of hospital with a cold that would turn into pneumonia. When I took him to the doctor, he said he would look at the worst case scenario and go from there.”

Unfortunately, Jarrah is living with the worst scenario. A-T affects a portion of the brain called the cerebellum, causing increasing lack of coordination, and weakens the immune system, leading to respiratory disorders and increased risk of cancer.

Most A-T sufferers are diagnosed in early childhood with symptoms such as lack of balance, slurred speech, and increased infections.

“For a month after the diagnosis, no one could talk to me. I would burst into tears for no reason.”

“This is a very rare disorder, affecting approximately three in every million children, but it holds the key to understanding cancer and neurodegeneration in other conditions,” said Professor Martin Lavin, Head of QIMR’s Radiation Biology and Oncology Laboratory.

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From the Director

As a supporter of medical research and somebody who interacts regularly with QIMR, you will know of the diversity of research activities that are carried out here. With over 50 research groups and multiple research topics in each of them, inevitably there is significant breadth in QIMR’s activities. Since I came to QIMR I have been analysing the activities that are ongoing, discussing with the research groups and informing myself on the needs, particularly of Queensland, and this has given rise to some internal restructuring which will provide greater focussing of QIMR’s activities in the future.

All research in QIMR is now focussed into three different programmes. These are Cancer, Infectious Diseases and Mental Health/Complex Disorders. Within the Cancer Programme there are strengths within QIMR that can be built upon. Again you will be familiar with these from the information that QIMR presents and they include in particular skin cancer, breast and ovary cancers, leukaemias and cancers of the gastrointestinal tract (from the oesophagus through to colon).

Infectious Diseases have also been a major area of engagement and indeed responsibility of QIMR. Given Queensland’s location, attention has to be paid to those diseases that are generally in the domain of tropical health and that would include malaria, various parasite diseases and some diseases caused by viruses.

The third programme has a particular focus on Mental Health. This is a relatively new area in QIMR but one where the disease burden is growing rapidly in Australia and worldwide. The focus here is on close-to-clinic work on major topics such as depression, schizophrenia, anxiety and Alzheimer’s disease.

Underpinning these programmes are all of the skills that get highlighted in the reports from the different research groups. QIMR is particularly strong in the areas of genetics, immunology and public health. Indeed the latter activity is one that provides a special emphasis from QIMR on disease prevention rather than cure. I think all of us would agree that having advances in prevention are particularly welcome and this will remain an important aspect of QIMR’s work.

Collectively therefore QIMR will provide excellent underpinning research that will have major impacts on the diseases that affect our community. Support for those areas is indeed always welcome and our commitment is that resources provided for research in the three programmes will be effectively used to improve the wellbeing of the citizens that we interact with.

Professor Frank Gannon
Director - QIMR

The gene defect that causes A-T was discovered and named after the disease, ataxia-telangiectasia mutated (ATM).

“DNA in every cell can be damaged from everyday things like sunlight. In normal cells, the ATM gene recognises and corrects errors or damage to DNA. However, when the ATM gene is mutated, as in A-T, damaged DNA is not repaired correctly and the cell will either die, or has an increased risk of giving rise to cancer,” said Professor Lavin.

“In people without A-T, small changes in the sequence of the gene have been found to play a role in many cancers, including stomach and breast cancer. Understanding how the ATM gene works will shed light on how cancers develop.”

“In our research of A-T, we hope to find out much more about the ATM gene and how crucial it is for a wide range of processes in the body.”

“An important goal of our research is also to prevent the cells in the cerebellum from dying and to replenish the ones that have died due to A-T. Potentially, we may be able to use adult stem cells from the sinuses of patients and families to do this.”

“If we can reconstitute the ATM gene in these stem cells and teach them to become brain cells, we might be

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The ACRF Centre for Cancer Epigenetics

The Australian Cancer Research Foundation (ACRF) Centre for Cancer Epigenetics was officially opened on 19 July by Ms Grace Grace MP, State Member for Brisbane Central.

Professor Emma Whitelaw, Head of QIMR’s Epigenetics Laboratory said the support of the Australian Cancer Research Foundation is crucial to expanding the emerging field of epigenetics research.

“Epigenetics is a relatively new field that investigates chemical marks attached to our DNA. If you think of DNA as a long book, these marks are like highlighter or crossing out, telling the body to read a gene or to ignore it.”

“If a gene that would usually protect against cancer is crossed out, it means that person would have a higher risk of developing cancer.”

“It helps to explain how people with the same genes can be affected by different diseases or by differing degrees of the same disease.”

“We know that the epigenetic marks are known to be abnormal in many different cancers. However, we do not know whether epigenetic changes are important in cancer initiation or a consequence of cancer growth – whether these abnormal marks cause cancer or are a result of cancer.

“We are also trying to understand which genes control epigenetic marks. By eliminating the genes that change epigenetic marks, we will be able to understand how they affect or are affected by our environment.”

BrAshA-T was founded in 2007 by a Brisbane couple, Krissy and Sean Roebig after two of their young children, Brady 7 and Ashleigh 6, were diagnosed with A-T.

Determined to do something, they created BrAshA-T to raise money to support research into finding a cure and forming a support network for other families dealing with A-T.

BrAshA-T has raised substantial funds for A-T research at QIMR including funding a dedicated research fellowship.

Tragically Sean Roebig passed away last year, nine months after he was diagnosed with cancer. His loving family continues to raise funds in his honour and remain focused on helping to find a cure for A-T.
The fight against blood cancers attracts some inspiring support

Dr Steven Lane is a researcher in QIMR’s Leukaemia Foundation Laboratory and a clinical haematologist at the Royal Brisbane and Women’s Hospital (RBWH).

“I’ve been fortunate to witness some of the amazing advances in medical research over the last few years,” explains Dr Lane.

“However, there are still many cancer patients who have limited or no treatment options, or whose disease doesn’t respond to the usual treatments and have to look for other options.”

“Medical research is the only way to find something that can help people like this.”

“My research concentrates specifically on two main types of blood cancers – acute myeloid leukaemia and myeloproliferative disorders, such as polycythemia. In particular, I am interested in what causes these blood cancers and why these blood cancers often relapse after chemotherapy treatment.”

According to Dr Lane, both of these questions relate to cancer stem cells. “These rare blood cells usually live in the bone marrow, and are the cause of blood cancers. When patients are treated with chemotherapy, these cancer stem cells are able to hide from the effects of chemotherapy and cause relapse.”

“We’re testing drugs that force these cells to change their usual protection mechanisms, and become more sensitive to chemotherapy.”

Dr Lane has been fortunate to recently receive two significant gifts which will go a long way towards supporting his important research program.

The first was a very generous two year donation from Dr Glen Truscott of Brisbane, which will be used to advance his research into myeloproliferative disorders.

“We all know that breakthroughs in medical research require time and hard work; they require the total commitment of scientists and they also require significant community support. I am very pleased to provide some support to Dr Lane and wish him every success with his research” said Dr Truscott.

Dr Lane was also awarded the Rhys Pengelly Leukaemia Research Fellowship which is funded by InVitro Technologies and J J Richards Pty Ltd.

He will be mentored by Australia Fellow, Professor Geoff Hill, who is the Laboratory Head of the Bone Marrow Transplantation Laboratory at QIMR. “We are very grateful to In Vitro Technologies and the Richards family for their donation of this research fellowship” said Professor Hill. “Their support will allow Dr Lane, a very deserving and outstanding researcher, to establish a new research team at QIMR dedicated to acute leukaemia. Having just returned to Australia after being recruited from the Harvard Medical School, Dr Lane brings with him his skills as a haematologist and his exceptional research experience. He has a very promising future and I have no doubt that he will become one of Australia’s leading leukaemia researchers”.

The Fellowship is named in honour of Rhys Pengelly who tragically passed away at 20 years of age from leukaemia. Rhys’s mother Kellie, who is a valued member of the J J Richards team, is hopeful that this research will lead to new treatments that will help other families. The family have purchased a star in his memory and they are very happy knowing that Rhys’s star is shining on QIMR.
Riding for life-saving research

Amy and Chris Hennessey were fighting against cancer long before they joined the Rio Tinto Ride to Conquer Cancer. Incredibly, Amy has personally conquered cancer twice already.

In July 2003, the then 21-year-old was diagnosed with a football-sized tumour in her pelvis and lower back. A 16-hour operation to remove the tumour, followed by a year of intensive chemotherapy left Amy unable to walk. After two years of recuperation and teaching herself to walk again, Amy returned to work in 2005.

Her life changed for the better when the devoted primary school teacher met and fell in love with physical education teacher Chris Hennessey. She was incredibly happy and relieved to have the worst behind her and to start a new chapter in her life. However in December 2007 – two months after the couple’s wedding – scans revealed Amy had redeveloped Ewing’s sarcoma, a rare but highly aggressive form of cancer in her right lung.

“I think knowing what I was facing made it a lot more difficult” she said.

Chris said he knows the importance of medical research to every cancer sufferer. “Between Amy’s first diagnosis and her relapse six years later, the techniques and therapies had changed significantly. Without these advances, I’m not sure she would have survived the relapse,” said Chris.

The Hennesseys recently toured the cancer laboratories at QIMR with cancer researcher Dr Chris Schmidt, who is looking at a new technique to treat cancer.

“It’s just amazing seeing the work that is going on here,” said Amy. “Research is so important to everyone, not just to the researchers, but to the people affected by cancer. “We have seen for ourselves the difference that advances in medical research have meant to the treatment and care of people with cancer. “

“I would challenge anyone to come here and spend some time meeting the researchers and hearing about the research going on behind these doors and not be inspired.”

Chris is now preparing for the Rio Tinto Ride to Conquer Cancer, a two-day, 200 kilometre cycling event through Queensland’s Somerset region benefiting QIMR.
Glaucoma

Scientists at QIMR have discovered two new genes linked to glaucoma and published their results in the prestigious international science journal, Nature Genetics.

Dr Stuart MacGregor from QIMR’s Queensland Statistical Genetics Laboratory said, “This discovery will help to identify patients at the highest risk of severe glaucoma. It opens the pathway to developing completely new ways of treating glaucoma patients that could delay disease progression and prevent blindness.”

Open angle glaucoma, sometimes called chronic glaucoma, is the most common type of glaucoma, and tends to progress at a slow rate. Sufferers may not notice that they have lost vision until the disease has progressed significantly.

“We found that 18% of the population carry risk variants at these two genes, making them up to three times more likely to develop severe glaucoma than those who don’t.”

Glaucoma is the leading cause of irreversible blindness worldwide, affecting an estimated 300,000 people in Australia, half of whom are currently undiagnosed. It is the collective name for eye diseases causing irreversible loss of peripheral vision, often associated with too much pressure developing inside the eyeball.

“Although open angle glaucoma is the most common form of the disease, it is poorly understood and difficult to diagnose in its early stages. Many cases still remain undiagnosed until irreversible loss of vision has occurred.”

"Glaucoma is the leading cause of irreversible blindness worldwide, affecting an estimated 300,000 people in Australia, half of whom are currently undiagnosed."
Examining these genetic variations can help us understand how diseases occur in different populations which ultimately depend on the region from which they originated.

According to Dr Joseph Powell from QIMR’s Queensland Statistical Genetics Laboratory, “The movement of humans throughout the globe has played an important role in shaping the diversity of our genes. Our research has unravelled differences in genetic markers from people from a broad range of ethnic backgrounds.”

“Examining these genetic variations can help us understand how diseases occur in different populations which ultimately depend on the region from which they originated.”

“Also, by exploring how markers have changed over time, we can support the work of archaeologists and anthropologists in understanding how ancient populations came together and moved apart over hundreds of thousands of years,” explains Dr Powell.

“Our results provide strong evidence that tens of thousands of years ago one group moved out of Africa, and settled down in an area away from other African groups. From this settlement, a group broke away and migrated towards Asia. Thousands of years later the original settlement was then joined by another wave of people from Africa, at which point, a second group broke off and moved towards Europe.”

Out of Africa

By studying the DNA of people today, QIMR researchers have been able to unlock the movement of ancient man and map the migration patterns of humans thousands of years ago.
The countdown to our major fundraising event - The Rio Tinto Ride to Conquer Cancer - has begun and the excitement is mounting.

We would like to encourage all our friends and supporters to come along and be part of the fun at this historic event. Everyone is welcome to join us at the start/finish line to cheer on all the wonderful people who are taking part in the two day bike ride.

The Chief Executive of Rio Tinto, Mr Tom Albanese, demonstrated his wholehearted support of the event by hosting a corporate breakfast in Brisbane on 24 June. Over 300 people attended the breakfast held at the Queensland Rugby Club in the city.

BELIEVE ONE CAN MAKE AN IMPACT, AND THOUSANDS CAN CONQUER CANCER

STRENGTH IN NUMBERS

The Rio Tinto Ride to Conquer Cancer

Saturday 20 August
6 am to 9 am

Sunday 21 August
1 pm onwards

Parklands on Mill Road at the University of Queensland, St Lucia

Powered by sunsuper

Rio Tinto’s Mr Doug Ritchie (left) and Mr Tom Albanese at the breakfast
We just want to say thank you!

Thanks a million Clive!

The Chair of QIMR, Professor John Hay, hosted a luncheon to honour and thank Mr Clive Berghofer in this, his tenth year of outstanding support of QIMR.

As our largest individual donor, Clive has played a major role in shaping our Institute and we are deeply grateful. Over the last ten years, Clive’s support has provided our scientists with the opportunity to make a significant contribution to global cancer research from which, ultimately, the entire community benefits.

The researchers who work in the Clive Berghofer Cancer Research Centre know that the building bears the name of a man who is a community visionary and a true believer in the value of medical research. He will continue to inspire our scientists – not only those who are working here now but those who are yet to come.

Inglestone’s Big Cuppa Tea fundraiser

The Inglestone Country Women’s Association (CWA) held a ‘Big Cuppa Tea’ fundraising day in celebration of 60 years of service in May this year. The day included lunch for a crowd of 200, while there were also market stalls, a cent auction and raffles with prizes generously donated by local businesses.

Approximately $4,000 was raised for QIMR. Secretary of the Inglestone CWA, Ms Gill Kidd said the fundraising efforts were “not bad for a community that is only a location consisting of a hall, tennis courts and a golf club.”

On behalf of the team at QIMR, we would like to thank and acknowledge Gill Kidd, guest speaker Sam Bailey and all of the volunteers and local businesses involved with organising such a special day to benefit our medical research.

Witchery supports breast cancer research through annual pink ribbon sales

A big thank you to Witchery for the annual sale of pink ribbons throughout their Queensland stores. The proceeds of the 2010 pink ribbon sales raised over $15,700 which will be directed to our breast cancer research programme.

Their ongoing support provides great encouragement to our researchers and also serves as hope among the many women who live with the burden of cancer. We commend Witchery on their wonderful community spirit. You too can purchase a pink ribbon benefiting QIMR’s breast cancer research from Witchery’s 27 stores in Queensland.
Mermaid Beach Bowls Club Sewing Group

Thank you to the wonderful ladies at Mermaid Beach Bowls Club Sewing Group. Each year they generously donate handmade quilts and cushions to QIMR. The donated items are then given to the Toowoomba Women’s Golf Club group who use the item as a prize for their breast cancer fundraiser in October.

Inner Wheel Group of Toowoomba

A cheque for $1,250 was recently presented to QIMR’s Bequest Officer Joan Stockman. We are very grateful to receive this wonderful support and look forward to our continued association with the Inner Wheel Group of Toowoomba.

Nambour Golf Club

The Beth Cuthbertson Cancer Charity Day was another successful fundraiser with over $800 raised. We appreciate the hard work that was involved with organising the annual event. A special thank you to President Gail Campling and Captain Lindel Forsyth for making the golf day possible and for the many local Nambour businesses that donated prizes.

Research Roadshow

We are taking our research on the road and visiting regional areas to update supporters on QIMR’s latest achievements. We understand that it can be difficult for some of our donors to travel to QIMR so this is another way we can keep in touch and answer any questions they may have about how their donations are being used.

If you live outside of Brisbane then we may be coming your way soon! Keep an eye out for an invitation in the mail – we will be sending them to all our friends and donors in the areas we are visiting.

QIMR RESEARCH

Coming to a town near you!
Carmel Farrow Annual Walk for Ovarian Cancer Research

Since 2009 renowned artist Ken Farrow has held an annual art exhibition to raise funds for QIMR’s ovarian cancer research.

Now he, together with fellow Montville resident Frances Nelson, are organising a fundraising walk in memory of Ken’s wife Carmel who sadly lost her life to ovarian cancer in 2010.

Ovarian cancer affects around 1,200 women in Australia each year and only 40% of women diagnosed survive more than five years.

Participating in the Carmel Farrow Annual Walk is a great way to raise funds for our ovarian cancer research and provides a wonderful opportunity to view the Sunshine Coast hinterland area.

Details are:
• Sunday 25 September, Starts at 8am
• Where: Begins at Mapleton Tavern, Mapleton and is approximately 6kms long
• Funds raised support ovarian cancer research at QIMR
• To register your interest please contact: Frances on 07 5445 7223 or email francey@westnet.com.au

Fitton Insurance Charity Race Day

Toowoomba’s famous Fitton Insurance Charity Race Day is on again this year with exciting races, fashion parades and fantastic prizes to win.

Thanks to the ongoing generosity and dedication of Del Fitton and her son Ron Fitton from Fitton Insurance Brokers we have received a staggering $200,000 plus in vital funding for our medical research.

Del’s charitable service to the community and her promotion of the thoroughbred horse industry was recognised this year when she received an Order of Australia Medal in the Queen’s Birthday Honour list.

The Fitton Insurance Race Day will be held at Clifford Park on Saturday 24 September. Don’t delay as tickets will go quickly. You can purchase your tickets or table by contacting Fitton Insurance Brokers on (07) 4638 4233.

Upcoming events