

# Brain Matters

News from the Florey Institute of Neuroscience & Mental Health



## A LIFE RESTORED

Adam's life can take off thanks to Florey ingenuity.

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## Director's Report



**W**elcome to the first Brain Matters for 2017.

We are very pleased to be able to offer you, our valued supporters, a wealth of positive news on many fronts. Research of the brain continues to provide fascinating stories – as you will read in this edition.

I am pleased to report that the Florey had great success in the latest round of Federal Government funding. We are busily planning how we can expand our research teams and fast-track results. The better our funding, the faster we can make discoveries which may lead to treatments.



We were also very pleased to hear that our esteemed colleague, Laureate Professor Colin Masters, was recognised as an Officer in the General Division of the Order of Australia on January

26. This acknowledges Colin's ground-breaking work understanding the mechanisms that cause Alzheimer's disease. Researchers around the world have learned from Colin's prolific rate of discovery and continue to search for ways to prevent or remove the build-up of amyloid beta in the brains of people with dementia.

Whenever an opportunity arises to meet with our supporters, I take it. I do hope to see you at the first lecture of our public lecture series, launching on April 4. I will be speaking with two other neurologists, colleagues here at the Florey, on our stroke research. Please join me, Professor Chris Bladin and Associate Professor Amy Brodtmann in Parkville if you can. Otherwise, the lecture will be recorded and placed on our website.

Please see the back page for more lecture topics, dates and times. This year we are holding more daytime lectures as well as our regular evening offerings.

We always enjoy offering our supporters a tour of our magnificent facilities. Please contact us if you would like to visit. Our brilliant researchers will be happy to describe their work and will, perhaps, inspire you to become even more involved in the life of the Florey.

Finally, I'd like to acknowledge one of our supporters, Mrs Jennifer McCrohon. Jennifer, who is leaving us a gift in her Will, has lived with schizophrenia for many years and tells us about her life on page 6 – a courageous and generous gesture. Thank you, Jennifer.

**Professor Geoffrey Donnan AO**

Director, the Florey Institute of Neuroscience & Mental Health

## Dr Vella wins dementia grant



**D**r Laura Vella has been awarded the John Shutes Project Grant from the Alzheimer's Australia Dementia Grants Program.

The award, valued at \$50,000, will allow Laura to investigate 'exosomes' - tiny membrane spheres containing different protein messengers that cells use to talk with one another.

Exosomes, however, may also spread disease-causing proteins around the brain, an hypothesis that Laura will now be able to test in Alzheimer's disease thanks to this generous award.

Congratulations, Laura, and thank you to Alzheimer's Australia. <#>

## Mobile Stroke Unit set to hit Melbourne's roads

**M**elbourne is set to receive Australia's first dedicated stroke ambulance later this year, when the \$1.2 million vehicle, equipped with a fridge-sized CT scanner and mobile laboratory, rolls onto our roads.

The addition of the stroke ambulance to the fleet means suspected stroke patients would have a brain scan at the site of their stroke – perhaps at home – giving them access to lifesaving drugs up to an hour earlier than standard practice.

The project has been driven by Florey Director, Professor Geoffrey Donnan AO, and the Head of Neurology at Royal Melbourne Hospital, Professor Steven Davis.

Some 80 per cent of all strokes are caused by a blocked blood vessel in the brain. These ischaemic strokes cut off blood flow, with millions of brain cells dying every minute they are deprived of oxygen.

The remaining type of stroke – haemorrhagic strokes – are due to a burst blood vessel, with blood leaking into the brain.

Ischaemic strokes are treatable by giving patients clot-busting drugs. These, however, can only be given within four hours of the stroke onset, and if mistakenly given to a haemorrhagic stroke patient could cause even more damage by exacerbating the brain bleed. This means that only seven per cent of eligible patients currently receive clot busting drugs.

The mobile stroke ambulance with its CT scanner and videoconference facility will allow on-call neurologists to determine which type of stroke a patient has had, and the mobile laboratory helps pinpoint when the stroke occurred. Clot busting agents can then be given to patients en route to the hospital, saving time and brain tissue. Every 15 minutes saved results in an extra one month of healthy life. <#>

# Goodbye seizures; hello life



Professor Graeme Jackson and patient Adam Fisher who is now free of seizures.

**M**edical experts, led by the Florey's imaging and epilepsy teams, have rescued a young man from a life of crippling disability.

Adam Fisher is a pretty typical 21 year old from western Gippsland in country Victoria. He enjoys footy and dreams of exploring, scrimping and saving for his planned travels around Japan and China as soon as the bank balance allows.

In many ways though, Adam is far from your typical young man embarking on life's adventures.

Florey's head of Epilepsy, Professor Graeme Jackson, considers Adam to be a star recruit of a new diagnostic and treatment regime that is changing lives for people with a type of focal epilepsy known as 'bottom of sulcus dysplasia'.

This dysplasia is a developmental disorder involving abnormal development of cells in the frontal or temporal lobes of the brain. Graeme describes it as "a sort of birthmark on the brain", causing seizures often starting in childhood. Adam's seizures, however, started when he was around 13 years old, right at the beginning of his high school years. For a while his epilepsy was managed well enough by medication, switching from one drug to another when necessary.

Over the next seven years, Adam's epilepsy became drug treatment resistant, or in medical jargon "intractable".

In 2015 Adam's seizures became severe. With little to no warning, a seizure would strike, causing Adam to fall to the ground. Experiencing up to 15 seizures a day, daily activities that we take for granted became impossible for Adam to perform.

According to Adam's dad, Craig: "The sporting community has been really tight knit in Yarragon. You find out who your friends are when something like this hits, that's for sure. But on the whole, people were really great through the whole experience."

Luckily, Adam's GP referred him to the regional epilepsy clinic in Warragul, where Graeme, who grew up in the area, still visits once a month. Right away, Graeme diagnosed Adam's condition and set about accessing support within the health system. Magnetic resonance imaging (MRI) combined with electroencephalography (EEG) clarified the situation and mapped the way forward.

Adam underwent surgery to remove the abnormal brain tissue through a hole in his skull no larger than a 50 cent piece, with the surgeons at Austin Health removing brain tissue about the size of a small fingernail.

**The world's peak body for epilepsy, the American Epilepsy Society, has recognised the gold-standard of the Florey's epilepsy research.**

This tiny piece of brain tissue was entirely responsible for Adam's seizures, and since the operation he has not experienced another seizure.

Adam says, "It's actually hard to believe it was just a year ago. It feels like 10 years or more since the seizures were really affecting my life. Mum's a bit of a worrier, and anytime I'm feeling a bit off, mum thinks the epilepsy has come back, but I haven't had a single seizure since the operation."

According to Graeme: "Adam is really very lucky. From the time his seizures became extremely frequent and severe, to the time we got him into the surgical theatre was about nine months, which is remarkable.

"Our imaging capabilities and collective experience have really cracked open the diagnosis of this type of epilepsy. Simon Harvey at the Royal Children's Hospital is now routinely treating kids with this epilepsy who would previously have had to endure years of seizures. It might take up to a decade for our recommendations to become common practice around the world, but in the meantime we can be confident that Australian kids are receiving absolute world's-best care and treatment for epilepsy."

And others agree. The world's peak body for epilepsy, the American Epilepsy Society, has recognised the gold-standard of the Florey's epilepsy research, with a trio of Florey researchers taking home awards from their latest annual meeting. Two early career researchers led the field home: Dr Genevieve Rayner received the Grass Young Investigator Award and Aaron Warren received the Suzanne and Peter Berry Award for PhD students. Leading the trifecta, Graeme was recognised with the 2016 Epilepsy Research Recognition Award for Clinical Science, which reflects his outstanding and ongoing contribution to international epilepsy research and treatment. 

# Researching the concussion risk for female athletes



Ross Oakley OAM is a champion of the Florey's concussion research.



Midfielder, Emma Grant, suffered a concussion during Collingwood's first match.

**I**n early February, when the players ran onto the field to contest the brand new Australian Football League Women's competition, there wasn't a spare seat in the stadium. Sitting alongside the fans were researchers from the Florey who were paying close attention to the players' welfare.

They didn't need to wait long. Magpies midfielder, Emma Grant, left the ground at halftime with concussion.

Florey neurologist and sports physician Professor Paul McCrory has been leading a landmark study into the effects of concussion on athletes from contact sports for 30 years, and is keen to monitor and learn from data relating to the female players.

"A key thing we know already is that women sportspeople have twice the rate of concussion as men," says Paul. "They are at a higher risk and now that both men and women are playing elite Australian Rules, it gives us a chance to compare those two groups."

Paul says there are several theories as to why women suffer double the number of concussions - but there are also plenty of unknown causes. Women athletes may be more likely to report the symptoms of concussion, or it may be that women in contact sports often have smaller necks than their male counterparts meaning they are less able to effectively brace for impact.

Interestingly, in soccer, researchers have found that women going into a tackle tend to suffer the injury, while among the men's competition, it's the person being tackled who is more often hurt.

Before the AFLW kicked off, the Australian Football League, in conjunction with the Florey, had all the participating women footballers fill out a questionnaire relating to their brain health, previous knocks to the head and other information relating to concussion risk. The Florey plans to use these questionnaires as a baseline for future research into concussion among the AFLW footballers.

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"It's a stepping stone to more detailed studies on the female footballers," Paul says. "We see a chance to offer the women the same research program as the men have. We do not see the women footballers as a sub-category to study; they are being offered all the bells and whistles of our scanning and testing."

A keen onlooker of our brain scanning is Florey Board member Ross Oakley OAM, perhaps better known to AFL fans as 'Ross The Boss', for his time as the league's chief executive, for a decade from 1986, during which he transformed the Victorian game into a truly national code.

It would be fair to say that Prof McCrory's research and the Florey's signature annual AFL match with Collingwood, the Brain Game, are close to Ross Oakley's heart, or perhaps it's more accurate to say his head.

Before he was league CEO, Ross was a highly regarded St Kilda footballer, so he knows better than most the knocks and

bruises that come with being a high level athlete in a contact sport. In fact, Ross missed playing in the Saints' historic only premiership, by a solitary point against Collingwood in 1966, because he was injured.

The long-time supporter of mental health research has been a driving force in the creation of the annual Brain Game, where the AFL community acknowledges the work of the Florey and raises awareness and funds for ongoing science dedicated to protecting the brains of young amateur and elite athletes.

Ross is passionate about the need for research into brain disease having watched his parents suffer from, and succumb to, Alzheimer's disease almost three decades ago.

He also sort of remembers some heavy punishment to his own head during his St Kilda playing days.

"There was one time that I went up for a mark against Geelong and one of their players came off the bench, ran straight

at me and took my legs out while I was in the air," he recalls. "I landed on my coccyx and was out cold. I was gripping the ball so tightly, the umpire had to rip it from my hands because I wasn't awake."

Ross recalls waking up in the rooms after the game, being driven home and then playing the next week. "There were no concussion protocols at all back then. Things have changed so much," he says, pleased for today's players. "It's terrific."

Paul says the Florey's continuing scanning of retired AFL players is very close to revealing findings that will soon be published. He encourages any ex-footballers wishing to be part of the scanning program to contact the Florey, the AFL Players Association or the AFL. He also stresses that retired players who feel fine are also welcome to be scanned. The researchers are keen to examine healthy brains as well as ones where there are concerns. The research involves other contact sports, especially retired jockeys, male or female, and rugby players. 



Sarah D'Arcy of the Magpies is tackled by Shae Audley of the Blues.



Jennifer McCrohon

## Making the most of life

“**I've grown so much because of the disease, and learned so much.**”

**M**eet Jennifer McCrohon, a much admired and deeply appreciated donor. As Jennifer tells us in this story, she is grateful for medication which has made her life easier – and she wants to help others by leaving a gift in her Will. Her support will allow Florey researchers to develop new medications, improving the lives of those living with mental illnesses.

Jennifer McCrohon would not suggest she's had an easy life. Now in her seventies, this Keilor mother of two has managed life with schizophrenia for more than 40 years. Jennifer has spent many nights in psychiatric institutions and has suffered hallucinations and delusions, typical of many people living with this awful disease. She is quite open about the fact that she tried to take her own life on more than one occasion. It has not been an easy road.

Yet Jennifer's eyes shine and she smiles broadly as she says: “I've had a wonderful life! My life has been exciting because every day there's something new happening. I enjoy my life immensely. I wouldn't change a single thing”.

Not even having schizophrenia? “No,” she answers immediately. “I've grown so much because of the disease, and learned so much. I've learned sympathy and empathy. I know that none of us are perfect. We all make mistakes. I'm just so grateful that I've had the life I've had.”

Jennifer first encountered mental health issues at the age of 28, in the traumatic weeks following her father-in-law's very unexpected death. She was mothering two very young children, one of whom had health issues. Jennifer became very stressed and was unable to sleep. Soon she was admitted to Rydalmere Psychiatric Hospital where a doctor quietly informed her husband, Ian, that his wife had schizophrenia. It was only then that Jennifer's mother confessed that

Jennifer's grandfather hadn't died in an accident, as she'd always been told.

He'd lived with mental illness in a country town without medical or psychiatric support. After taking his own life, he was buried, in shame, outside the town cemetery. Jennifer's mother was distraught and angry that the illness had reappeared in her daughter.

Yet Jennifer has endured, through the death of her beloved husband from a brain tumour, through moving house, through it all. Her sons, Kevin and Mark, have been a tower of strength, and her strong faith has been important to her survival. Twice she attempted to step away from her medication and both times did not go well. She now understands and accepts that long-term medication is required to control her symptoms.

It was Jennifer's gratitude and admiration that prompted her to leave a bequest to the Florey, as a way of saying thank you to the medical researchers and clinicians who have developed the medications that have allowed her to live her wonderful life. Jennifer recently gave another donation to the Florey, in memory of her cousin's son, who sadly took his own life. The family's battle with mental illness, which is also Australia's battle, has claimed another victim.

“Mental health research is so important,” she said. “I'm on a really great drug at the moment and have been on it now for 15 years. I am so grateful to the scientists who created that drug that has allowed me to live the way I do. I live a normal life. I eat a balanced diet and I get up at 7 am every day. I have a wonderful family, wonderful, diverse friends. People have accepted me and supported me. I'm very lucky.”

Please join Jennifer and help the Florey develop new and improved drugs to treat schizophrenia by calling Margit on 03 8344 9679. <#>



### Schizophrenia is one of the most serious psychiatric diseases to strike young people.

Schizophrenia is one of the most serious psychiatric diseases to strike young people.

Dr Andrea Gogos is studying genes to try and find brain pathways involved in developing schizophrenia. She is looking at the way female sex hormones, particularly oestrogen, protect against schizophrenia and the ways the brain changes when there is a lack of oestrogen.

Andrea is now working on a unique set of genes. Her intriguing data set is now being interrogated by the Florey team in the Biological Psychiatry and Mental Health division, with the hope of identifying new therapeutic medications for schizophrenia.

## Healthy Brain Project



Dr Yen Ying Lim

**D**ementia is one of the leading causes of death in Australia and there is currently no cure.

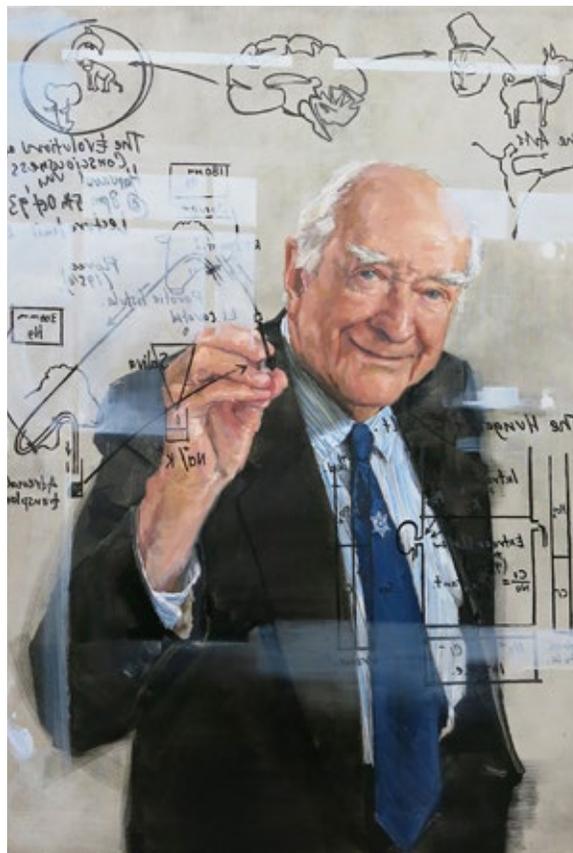
Dr Yen Ying Lim and Dr Rachel Buckley are embarking on an ambitious, multi-year dementia trial that aims to engage the community to track changing cognitive ability, and the determinants of healthy brain ageing in middle to later-age adults. The broader objective is to gauge the Australian population's very early risk factors for developing various dementias, including Alzheimer's, Lewy body dementia, fronto-temporal dementia, vascular dementia, Parkinson's and Huntington's disease.

The trial will study memory and other cognitive functions in middle-aged Australians. Yen and Rachel hope that by understanding the association between memory decline and genetics, mood, lifestyle, and even personality, they will uncover clues that will help combat this debilitating group of diseases.

The team is now recruiting volunteers between 40-65 years of age. There will be a significant amount of online interaction with other participants, with forums to communicate with the research team and each other, and each year participants will have access to their cognitive performance in relation to the rest of the group. Yen and Rachel hope that a sense of camaraderie and achievement, as well as vital scientific information, will arise from this new type of online-based, interactive study design.

If you are interested in participating in this study or simply in finding out more about it, please head to [www.healthybrainproject.org.au](http://www.healthybrainproject.org.au) or email [healthybrainproject@florey.edu.au](mailto:healthybrainproject@florey.edu.au)

## Unveiled: Florey legend Derek Denton AC



“**The portrait was painted by Evert Ploeg, an international award winning artist who is recognised as one of Australia's leading portrait painters.**”

*Equation of a life - a portrait of Professor Derek Denton, 2016.*  
Evert Ploeg (b. 1963), oil on linen.

Collection: National Portrait Gallery, Canberra. Commissioned with the assistance of funds provided by Janet Whiting AM, Philip Lukies and Antonia Syme 2016.

**T**he National Portrait Gallery in Canberra continues to celebrate significant Australians who reflect our identity, history and culture.

It is therefore a great honour that a portrait of the Florey Institute's former Director, Emeritus Professor Derek Denton AC, has been added to the collection. His portrait was painted by Evert Ploeg, an international award winning artist who is recognised as one of Australia's leading portrait painters. His many prizes include the Archibald Prize People's Choice Award in 1999 and the Archibald Prize Packer's Award in 2004.

The portrait was unveiled on 8 September 2016 by Harold Mitchell AC, Chairman of the Florey Institute for Neuroscience and Mental Health. Since the hanging of the portrait in Canberra, it has won the Portrait Society of America's 'Members Only' competition.

Professor Derek Denton is an internationally acclaimed and celebrated scientist whose research into the control of the chemical balance of fluids in the human body

was ground breaking and showed how genetically determined behaviours like thirst or salt appetite are regulated by chemical and hormonal changes in the brain.

In 1971 Professor Denton became Founding Director of the Howard Florey Institute, which evolved into the Florey Institute of Neuroscience and Mental Health. Under his leadership the Florey Institute flourished and became one of the world's leading medical research institutes.

The Florey is the beneficiary of his indefatigable search for knowledge to this day - after his retirement from the position of Director in 1989 Professor Denton has continued his research as Director Emeritus. He is now actively involved in the study of consciousness, dealing particularly with the organisation within the brain of instincts and primordial emotions.

The Florey is very proud and honoured to have its Founding Director acknowledged within the National Portrait Gallery and we all at the Florey warmly congratulate Professor Derek Denton on this achievement.

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Thank you for your valuable support. All donations are tax deductible.

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## Come along to a free public lecture

**Where:** Ian Potter auditorium,  
The Florey, Kenneth Myer Building,  
30 Royal Parade, Parkville (opposite  
the Royal Melbourne Hospital).

**Parking:** Reasonably priced parking  
(including disabled) is under the building  
with easy access to the auditorium.

**Transport:** Tram 19, Stop 11 heading away  
from the city, right outside our building.  
Look for the Dr Dax café sign and you'll  
know you're there.

**Bookings:** These public lectures are free.  
Bookings can be made by visiting  
[www.florey.edu.au/events](http://www.florey.edu.au/events) or by  
calling 1800 063 693.

### Latest news in stroke research and treatment

Three renowned stroke experts - the  
Florey's Director, Professor Geoffrey  
Donnan AO, Professor Chris Bladin and  
Professor Amy Brodtmann - will present  
the latest news in stroke research and  
treatment. There will be time for you  
to ask questions.

**Date:** Tuesday, 4 April  
**Time:** 11am - 12.15pm

### Motor neurone disease: from immune-inspired treatments to gene therapies, the Florey's latest in the chase for a cure

Dr Brad Turner, head of the Motor  
Neurone Disease laboratory at the  
Florey, will give an overview of the  
many various approaches taken in  
developing treatments and finding  
a cure for this disease.

**Date:** Wednesday, 7 June  
**Time:** 11am - 12.15pm

### Implantable brain devices are not science fiction.

Hear about how the Florey is developing  
devices to help people move paralysed  
limbs and control problematic gut  
conditions. Presented by Dr Nick Opie,  
Prof John Furness and Prof Clive May.

**Date:** Wednesday, 21 June  
**Time:** 6.30pm - 7.45pm

### The brain is the boss! The brain's crucial role in heart and kidney disease.

Hear how the Florey's latest research  
could save lives in intensive care units  
around the world. Presented by Prof Clive  
May and Prof Ronaldo Bellomo, director  
intensive care at Austin Health.

**Date:** Tuesday, 27 June  
**Time:** 6.30pm - 7.45pm

## Thank You

The Florey thanks our recent donors who kindly donated \$500 or more between October 2016 and January 2017\*

Christine Aarons | ANZ Dividend Charity Program | Nick Barton | John Bennetts | Graeme Billings | Lyndsey Cattermole AM | Peter Clark | Faye Clarke | Ken Cuming | Keith Curry | Eiril Deighton | Matthew Delasey | Rose Downer | Andrew Erikson | Estate of the late Betty May Elliott | Estate of the late Betty Rosina Elliott | Estate of the late Stephen Douglas Morgan | Estate of the late Loris Lorraine Grote | Estate of the late Thelma Joyce Jeffrey | Estate of the late William Robert Arnold Henderson | Evelyn Fawcett | Lukas Gates | Geoff & Helen Handbury Foundation | Peter Gillooly | Ai-Gul Guild | Ronda Hall | Andrew Keen | Peter Kelly | Malcolm Kennedy | Alison Leslie | Lions Club of Ormeau Inc | Maxim & Gail Lockyer | Don Martin | Heather Mason | Mavis McAllister | Denys McCullough | John Milne | Harold Mitchell AC | Gillian Montgomery | Richard Munt | The Hon Peter Nixon | Judith Overbeek | P & M Harbig (Holdings) Pty Ltd | Pakenham Opportunity Shop | Parkinson's Victoria Inc | Anthony Pyman | Ralph and Betty Sims Fund | Clare Reavey | Ralph Renard | Carol Richardson | Bob Santamaria | Scots Glen Singers | Betty Smith | Valerie Smith | Jacqueline Stephens | Dr Christine Sweeney | Jennifer Tatchell | Robin Taylor | The Baker Foundation | The Dowd Foundation | The Grocer Food Distributors | The Residents of Cumberland View Retirement Living | The William Angliss (Vic) Charitable Fund | The Yulgilbar Foundation | Jean Thomas | Maurice & Dinah Tobias | John White | Professor James Wiley | Matthew Wilson | Sineke Winter

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Find us on Facebook and Twitter at our website: [florey.edu.au](http://florey.edu.au)

The Florey Institute of Neuroscience and Mental Health conducts its research on the lands of the Wurundjeri people of the Kulin Nation. We pay our respects to the traditional owners of this country, their ancestors, their children and the lore of the creator spirit Bunjil.

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