

# Brain Matters

News from the Florey Institute of Neuroscience and Mental Health



## MURAL TELLS TALE OF INSPIRING RESEARCH JOURNEY

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## Director's Report



I hope this issue of Brain Matters finds you healthy and in good spirits despite the extremely challenging last few months. If 2020 has taught us anything so far, it is that things can change quickly. As I'm writing this, it is 15 April 2020 and Australia is in stage 3 restrictions caused by COVID-19. It is difficult to tell what the future holds, but I very much hope that by the time this column is in your hands that we will have averted the worst of this public health crisis.

I wanted to devote my column to making one very important request of you - if you're finding things difficult right now, please seek help.

There is not a single aspect of any person's life that hasn't been impacted in some way by the difficult start to the year. While the Florey does not provide support services ourselves, our mental health researchers remain hard at work uncovering the biological causes and contributors to serious mental illnesses. We also know that partnerships and collaboration across all areas of the mental health system can play an important role in improving outcomes for people affected. The most critical aspect of this is that people step forward and let someone know when they need help.

Both the COVID-19 crisis and the bushfires this year were beyond what we could have imagined. It is not a sign of weakness to have this affect you, and is an act of intelligence and courage to choose to speak to someone about this. If you need to do so, your GP is a good place to start.

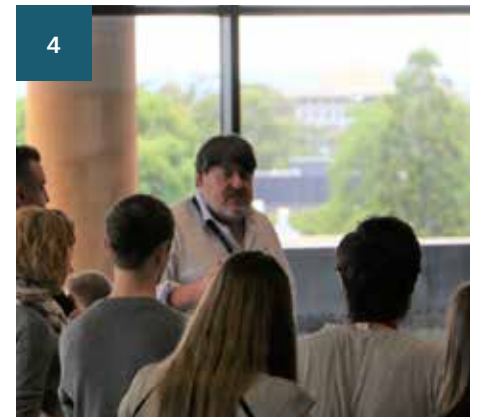
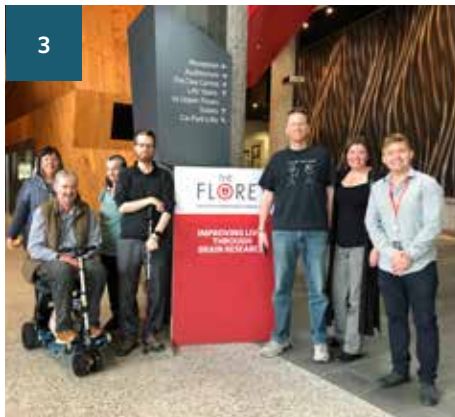
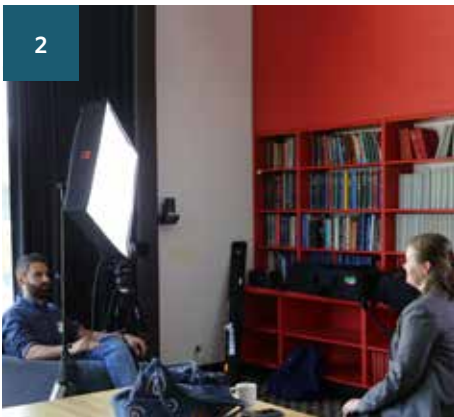
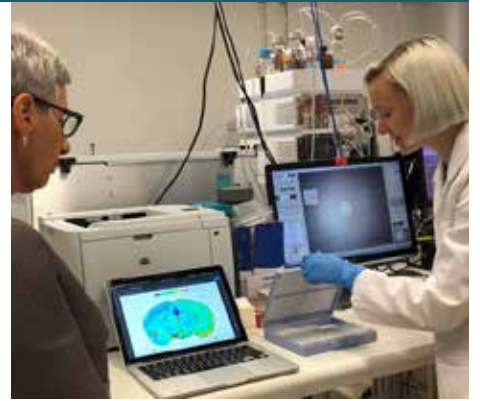
On a personal note, I want to thank you for your ongoing support of the Florey. Our researchers have worked in innovative and creative ways over the last few months to maintain our important research in Alzheimer's disease and other dementias, stroke, mental health, epilepsy, MND, and uncovering new knowledge about many other areas of the brain.

We could not have done so without your contributions and support. Thank you.

Professor Steven Petrou PhD FAHMS  
Director, Florey Institute of Neuroscience and Mental Health

# Out and about

- 1 It was our pleasure to welcome Her Excellency the Honourable Linda Dessau AC, Governor of Victoria to share with her precision treatment approaches in the Australian Epilepsy Project, as well as new therapeutics in MND and Parkinson's disease. Pictured with our Director Prof Steve Petrou, Prof Graeme Jackson, epilepsy advocate Rachael Vella and Dr Erin McAllum.
- 2 Stroke researcher Dr Karen Borschmann featured on Network Ten's The Project raising awareness of the challenges faced by young people who experience stroke.
- 3 Kennedy's disease advocates and their families visited A/Prof Brad Turner at the Florey for Rare Diseases day.
- 4 Director Prof Steve Petrou welcomed the bright new minds of our 2020 research students at a welcome BBQ get-together.
- 5 In February, the Florey hosted University of Maryland School of Medicine Professors Tracy Bale who conducts research into epigenetics and Scott Thompson who investigates major depressive disorder. Prof Bale and Prof Thompson collaborated with Florey researchers and presented their latest work.
- 6 Prof Julie Bernhardt discussed stroke recovery and current research approaches at the Florey to improve stroke rehabilitation with Sally Cockburn on 3AW and partner stations.
- 7 Congratulations to Dr Jennifer Hollands selected as a 2020 STEM ambassador who will partner with Member for Cooper Ms Ged Kearney MP (Shadow Minister for Aged Care) to foster relationships between science and government.
- 8 PhD researcher Michelle Shannon is investigating if the physical environment of rehabilitation can impact stroke recovery. Pictured with stroke survivor and study participant, Tim McCartin, modelling the study's virtual reality equipment.
- 9 Research Assistants play an important role in ensuring research projects run smoothly. Professional development was the topic of discussion at the morning tea.



# Shawna's inspiring research tale told through art



The work of Dr Shawna Farquharson has been celebrated on the streets of Melbourne as part of the Metro Tunnel Creative Program

**“This artwork beautifully captures the breadth of a radiographer’s role in collaborating with both patients and healthcare professionals to support scientific and clinical advances. It’s an absolute honour to be representing the Florey in the Parkville Storytelling Project.”**

**Dr Shawna Farquharson,  
Chief Research  
Radiographer**

**S**hawna Farquharson describes 1997 as a defining moment in her career as a radiographer specialising in clinical research. She was a Senior Radiographer working in paediatrics at Great Ormond Street Hospital (GOSH) in London.

Every day, children would arrive battling the most complex illnesses. Every day, the brightest scientific minds would come together to work towards medical breakthroughs. And every day, clinical teams would deliver the highest quality of care, making a difference in the lives of each and every patient.

It was there she began to understand the importance of collaboration and the vital role of the radiographer. With insight into both technical and clinical aspects of healthcare, radiographers help to bridge the gap between scientific advances and patient care. For Shawna, this remains one of the most rewarding aspects of her profession.

Shawna is now the Chief Research Radiographer at the Florey Institute of Neuroscience and Mental Health. The more than 600 medical researchers at the Florey work on a range of serious diseases including stroke, epilepsy, Alzheimer’s, Parkinson’s and motor neurone diseases, depression and addiction. The search for causes, treatments and cures for conditions affecting the brain and mind couldn’t be more urgent.

Shawna’s team of research radiographers are trained to deliver the highest quality anatomical and functional Magnetic Resonance Imaging (MRI) studies. MRI has become a key tool in the study of the brain. It’s a rapidly evolving field and so highly specialised radiographers are an integral part of the research team, helping to improve our understanding of the normal developing brain, the ageing brain, and our knowledge of trauma and pathologies affecting the brain.

Over the last decade in her role at the Florey, Shawna has had the opportunity to contribute to groundbreaking work in neuroscience as well as providing patients’ with the most advanced imaging methods to improve the outcomes of surgery. She says it is a privilege to work at one of the world’s leading Neuroscience Institutes, but it’s seeing patient’s lives transformed that makes it all worthwhile. When a patient returns after surgery for a follow-up MRI scan, now seizure free and living life to the fullest for the first time, she is always reminded how important it is to keep striving to make a difference.

Shawna has recently been appointed as 2019-2020 President of the International Society for MR Radiographers and Technologists (SMRT) where she hopes to inspire and empower MR Radiographers and Technologists around the world to become future leaders of the profession. <#>

**Commissioned by the Metro Tunnel Creative Program  
Artwork: Illustration by Alice Lindstrom  
Photographer: Photos by Nicole Reed  
Story: Written by Sonja Dechia**

## Discovery sheds new light on key brain neurotransmitter



Professor Steve Petrou and Dr Alex Bryson

**A**s part of an international research collaboration, Dr Alex Bryson and Professor Steve Petrou have uncovered evidence that a key neurotransmitter in the human brain 'GABA' can selectively regulate the excitability of neurons - findings that challenge the prevailing scientific view.

"We don't yet know the full implications of this exciting discovery, but since GABA is the main inhibitory chemical messenger our research could provide better insight into how the brain regulates excitatory activity. I believe it could have relevance to our understanding of conditions such as epilepsy," said Dr Bryson.

Initially met with unexpected results, the researchers were compelled to investigate further.

"We were using computer models which predicted that GABA could have two different functions - increasing the excitability of one type of interneuron, and decreasing the excitability of another type of interneuron," explained Dr Bryson.


"This was surprising to us because GABA is primarily thought to inhibit or reduce the excitability of neurons," said Dr Bryson.

In collaboration with Dr Robert Hatch, fellow researcher in the Florey's Ion Channels and Human Diseases lab, the team then confirmed the findings by recording different types of interneurons in the presence of GABA.

The work was only possible with international collaboration between the Florey, the EPFL Blue Brain Project and the Australian Research Council Centre of Excellence for Integrative Brain Function, combining the Florey's receptor expertise and data, with modelling expertise and computational infrastructure of Blue Brain.

Professor Steve Petrou agreed that the research may well have significant implications.

"One of the greatest challenges remaining for scientists is understanding the human brain," said Professor Petrou.

"What we found in our work provides yet another piece of the complex puzzle." 

## 10 years and 100,000 patients: Improving Australian Stroke Care



Professor Dominique Cadilhac

**T**he Australian Stroke Clinical Registry (AuSCR) is a decade-long, national effort to deliver best practice care for people experiencing stroke. AuSCR recently marked dual milestones, celebrating 10 years of operation and 100,000 recorded cases of stroke care.

AuSCR collects information on care provided to someone who has experienced stroke, covering their journey from presentation to hospital, through to health outcomes after 3-6 months.

Real-time monitoring enables hospitals to fix 'gaps' in stroke treatments and benchmark their care and patient outcomes against 74 hospitals Australia-wide actively using the registry.

The Florey's Professor Dominique Cadilhac is custodian of the registry and says evidence shows initiatives like AuSCR work.

"We know that providing the best standard of care to patients hospitalised after stroke can lead to better outcomes, such as decreasing disability, preventable deaths and risk of recurrent stroke in the longer term."


"We continuously see improved stroke care in hospitals that take insights from the registry and implement quality improvements."

AuSCR recorded the care provided for Tim McCartin after he experienced two stroke episodes only months apart in 2019. The former high school principal considers himself very lucky to have since made a full recovery and advocates for initiatives like AuSCR that aim to improve stroke care.

"During my time in hospital and rehabilitation I saw firsthand how devastating stroke can be for a lot of people and families," said Mr McCartin.

"When I learnt of the registry, I thought why not use my experience to be a part of something that can help other people who have had a stroke," he explained.

AuSCR is a shared consortium between the Florey, The George Institute, The Stroke Foundation and Stroke Society of Australasia.

In addition to informing clinical care standards, data is also used in vital stroke care research including the Florey's work into understanding risk factors for stroke, effect of exercise on recovery post-stroke and other studies. 

## Stem cells restore movement in lab model of Parkinson's disease



Professor Clare Parish

**I**n a first-of-its kind approach, Florey researchers have established preclinical evidence that stem cell grafts can restore motor function in animals with Parkinson's disease.


Led by Professor Clare Parish, Head of the Florey's Stem Cell and Neurodevelopment Lab, the team investigated if combined use of stem cells and gene therapy could repair the brain in Parkinson's disease.

"By transplanting human stem cells into the brain along with viral delivery of a growth promoting protein called GDNF, we were able to restore motor function in animal models of Parkinson's disease," explained Professor Parish.

In Parkinson's disease, the gradual loss of dopamine neurons in the brain can cause movement difficulties. Using stem cell transplants to replace dopamine levels is not a new concept, but one that has presented significant

challenges to researchers due to poor integration of dopamine cells into the brain. The novel technique developed by Professor Parish and her team could change that.

Professor Parish says that more investigation is required before the technique could be available for people.

"We now hope to advance this stem cell approach to clinical trials in the coming years," added Professor Parish. 



Professor Parish's research made the front cover of esteemed journal *Cell Stem Cell*

## International Women's Day: Putting women's health and well-being under the microscope



Florey supporter Ai-Gul Guild and friend mixing with Florey experts at our International Women's Day Morning Tea

**I**n recognition of International Women's Day, an exclusive event for Florey donors was held on March 3 to showcase our research into health issues specific to women.

Supporters heard a lively discussion between Professor Amy Brodtmann, Dr Andrea Gogos, Dr Carli Roulston and Dr Scott Ayton in a conversation facilitated by Professor Anne-Louise Ponsonby.

This powerhouse panel examined how their work is helping to overcome challenges occurring in the diagnosis, prognosis and treatment of health problems in women.


Guests were invited to participate by asking panellists questions about how Florey research is being translated and contributing to improved health outcomes for women in the areas of Alzheimer's, mental health and stroke.

Florey supporter Margo Garnon-Williams said she found the panel to be thought-provoking and engaging.

"I find the work of researchers mind boggling! Proof of their patience and persistence. I loved the panel and the chats afterwards," said Margo.

While we have unfortunately had to postpone all supporter events in the near future in light of COVID-19, we are planning a series of online opportunities where we can get together to discuss our latest research in a safe and responsible way. In the meantime, stay informed on our latest research findings through our social media pages or by contacting a member of our fundraising team.

Learn more about our commitment to women in science and equity at the lab bench on our website, [www.florey.edu.au/science-research/equality-in-science](http://www.florey.edu.au/science-research/equality-in-science).

Thank you to our donors who attended our International Women's Day event, and to all those who support our Women In Science program. 

# Meet Barbara, a friend of the Florey who is on a mission to understand how things work

Barbara Darvall has been curious about all things science since she was a little girl, so it's no great surprise that she is an ardent Florey supporter.

"I just loved science at school. I was good at physics and had a great chemistry teacher. I still read a lot of scientific material and I love the technical stuff in Brain Matters," Barbara explains.

Barbara's first connection to the Florey was in 2001 after hearing former Florey Director Professor Derek Denton on Radio National's The Science Show.

"I heard Derek Denton talking about his book, The Pinnacle of Life: Consciousness and Self-Awareness in Humans and Animals," shared Barbara.

"He later sent me a signed copy which I still have on my bookshelf today. I just love the molecular understanding of the functioning of our bodies and the way the world works whether it's related to animal, person, geology or astrophysics".

"I first agreed to support the Florey for the Women in Science program. I think it's critical to keep women in the sector," Barbara added.

She vividly remembers her science teacher telling her all girls class in Brighton repeatedly how lucky they were to be studying science.

Now also a member of the Florey's giving group, the Brains Trust, Barbara enjoys meeting our researchers and probing them personally with questions about how the brain works. She is fascinated by neuroplasticity and how we can retrain our brain even after traumatic events like stroke.

“**The researchers are impressive. I like the way the Brains Trust allows lay people to connect to lab people, you feel close to the science and they take the time to explain complex things in simple ways.**”

Barbara has also generously decided to leave a gift in her Will to the Florey, and says that leaving a legacy is important to her.

"As a donor, it makes me feel like my support is ongoing – I really want to see the work continue. It's nice to see what you have accumulated go to a cause you know and trust." 🙌



Barbara Darvall and Hazel Brentnall sharing their passion for science at the Florey's International Women's Day Event

**If you would like to join Barbara as a Brains Trust donor, discuss leaving a gift in your Will or feature in Brain Matters please contact Alison or Nola by phone on 1800-063-693 or by email at [fundraising@florey.edu.au](mailto:fundraising@florey.edu.au).**

## Good news from the fundraising team

**C**ongratulations to Nola Wilmot, our Bequests and Advancement Executive, on being admitted as a Fellow of the Fundraising Institute of Australia.

**If you would like to ask Nola a question about leaving a gift to the Florey in your Will please contact her Monday to Thursday on [nola.wilmot@florey.edu.au](mailto:nola.wilmot@florey.edu.au) or 03 9035 9710.**



Nola pictured with Florey supporter Elizabeth Cam.

# I'D LIKE TO   **IMPROVE LIVES** **THROUGH BRAIN RESEARCH**

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- I would like more information about making automatic regular donations.
- I would like updates on brain research  by mail  by email
- I have left a gift in my Will to the Florey
- I would like to receive information about how I can remember the Florey in my Will

I would like to donate \$

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Enclosed is my  cheque  money order

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Other ways to donate:

- Call our free call credit card donation line on 1800 063 693
- Fax your donation to us on (03) 9035 3107
- Online at [www.florey.edu.au](http://www.florey.edu.au)
- Send your donation to The Florey Institute of Neuroscience & Mental Health, Reply Paid 83037, 30 Royal Parade, Parkville, VIC 3052

Thank you for your valuable support.  
All donations over \$2 are tax deductible.

Please let us know if you wish to change any of your personal details, contact preferences, or opt out, using any of the above contact methods. The Florey Institute of Neuroscience & Mental Health records information about its supporters that includes address and donation details, and is used solely by the institute but is not sold, traded or passed on to any third parties.





## Stay connected with us.

Keep up to date with all our Public Lectures and research news by visiting the Florey website and following us on social media.

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## International guest researcher welcomed at the Florey

The Florey was delighted to host guest lecturer Dr Tracy Bale, a Professor from the University of Maryland School of Medicine, Baltimore, USA, at our public lecture in February 2020. Dr Bale's presentation "Shaping the brain before, during and after birth" explored her fascinating research into the area of epigenetics. Dr Bale made an entertaining case to show how life experiences are transmitted biologically across generations. For those who were unable to join us, the lecture is available on the events page of our website.



Dr Tracy Bale

## Thank You

The Florey thanks our recent donors who kindly donated \$250 or more between 7 February 2020 and 24 April 2020

Australian NPC Disease Foundation | Bendigo Stadium | Louise Buchanan | Carter Family Foundation | M G Cavanagh | Nathasha Choi | Anthony & Geraldine Conabere | Rose Downer | Estate of Ethel May Billing | Estate of Jill Annette Lynch | Shirley Gionfriddo | Clare Gleeson-McGuire | Lesley Griffin | Hearts and Minds Investments | Linda Herd | Inner Wheel Club of Bairnsdale | JDR Family Trust | Dick Johnson | RE and NA Kent | Peggy Knight | Olga Magee | Jenelle McColl | Betty Meadows | Dennis Nassau | Judith Overbeek | Patsy Patten | Vanessa Payne | Chris Pearson | Qiankang Life Science Melbourne R&D Centre | Nicola Rollerson (Australian Philanthropic Services Foundation) | Stafford Fox Medical Research Foundation | Peter Symonds | Wendy Taylor | Elizabeth Trevena | Duncan Tuck | Carol Watkins | Graeme Peter White | Heather Williams | Sineke Winter

Between 7 February and 24 April 2020 we also gratefully acknowledge the following:

### Donations in memory of

Chris Baker	Luke Jackman	Jack Sibley
Margaret Butler	Dennis Lyne	Jeanette Dawn Williams
Evelyn and Keith Drew	Doris Piscopo	Carol Anne Wombwell
Garry Graham	Margaret Ilona Robson	Adrian Wreford

### Donations in celebration of birthday

Louis Piscopo

### Raising funds for the Florey in the Community

Charlotte Nielsen - Charlotte's Purple Day Campaign

For more information contact  
[communications@florey.edu.au](mailto:communications@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. Articles and photographs in this publication remain the property of the Florey and may not be reproduced without permission.