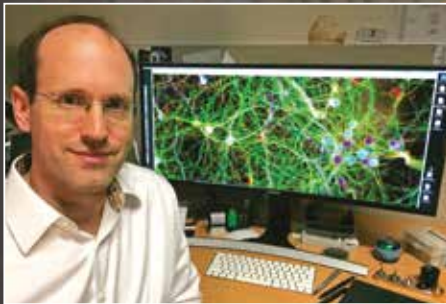


the NeuRA

magazine

Issue 23 | Summer 2017

New discovery
in motor neurone
disease sparks hope



- School lanterns beacons of hope
- Focus on hip fracture recovery
- How to build resilience in your life
- Schizophrenia lab seminar series
- Top tips on getting a good night's sleep
- New research into aged driver safety
- NeuRAtalks.org launches

NeuRAtalks has launched
Watch our new seminar
series online now!
www.neurataalks.org

Message from our Executive Director

Prof Peter Schofield



Prof Peter Schofield

It's hard to believe we are approaching the end of another year of outstanding research progress and profound discoveries at NeuRA.

With your support this year, we have been able to progress a number of crucial research programs especially in the areas of dementia and Alzheimer's disease, Cerebral Palsy and Motor Neurone Disease. In 2018 we will commence the largest bipolar disorder genome sequencing study ever conducted in Australia.

In May, we opened the Transurban Road Safety Centre and next year we will undertake a major research project aimed at keeping older drivers safer and on the roads for longer. We recognise that mobility and independence is critical for our ageing community, and we are committed to ensuring safety behind the wheel.

During Mental Health Week in October we launched NeuRAtalks.org, our new online seminar platform. We were pleased to welcome many of you to our NeuRA Talks program during Mental Health Week in Sydney and Melbourne. Across Australia you can now access these seminars on our neuroscience research and clinical trials at www.neuratalks.org

On behalf of the entire team at NeuRA, I want to thank you so much for your ongoing support, and wish you the very best greetings of the holiday season and a happy and prosperous New Year.

Prof Peter R Schofield *FAHMS PhD DSc*
Executive Director and CEO

Cover image: Shin Liu and his family

NeuRA Events

Local School Lanterns a Beacon of Hope

During Mental Health Month



in October, NeuRA invited local schools to participate in the Inaugural "Lighting the Way" glow lantern competition, working with local schools to run a design competition. With one in five teenagers experiencing some form of mental illness, our aim was to help light up the conversation around mental health issues in youth. The winning schools, Centennial Public School and Children's Hospital School, together took out first prize and received passes to visit the Powerhouse Museum.

Professor Awarded Prestigious International Fellowship



One of NeuRA's most senior researchers, Scientia Professor George Paxinos AO, recently spent a month in Beijing China, at the Chinese Academy of Science. He worked with upcoming PhD students, post-doctoral fellows and the Academy's own Professors on the topic of mapping the brain. Under the President's initiative to bring distinguished scientists to China, Prof Paxinos was awarded this esteemed Fellowship.

A Marathon, Mental Illness and Macquarie Bank



When Justin decided to participate in the Melbourne Marathon, he did so in support of NeuRA's research. A marathon is one of the toughest events to conquer, but motivating him was the opportunity to support research that will change the future of people living with schizophrenia - one of the world's most debilitating conditions. With the help of his generous supporters he raised almost \$5,000 with his workplace, Macquarie Bank, matching this amount.

This was a wonderful example of an individual and corporate showing a willingness to use a great community event to help fund research. Thank you Justin and Macquarie Bank.

NeuRA hosted breakfast at Parliament House



L-R, Dr Jan Fullerton, Dr Justine Gatt, Minister Tanya Davies, Prof Peter Schofield & Prof Cyndi Shannon Weickert

As part of our community engagement across Mental Health Week, NeuRA hosted a special breakfast event at NSW Parliament as a guest of the Hon Tanya Davies MP, the Minister for Mental Health, Women and Ageing. NeuRA's Prof Cyndi Shannon Weickert, Dr Jan Fullerton and Dr Justine Gatt each presented short and informative talks. The event was very well attended by local and rural MPs and has already resulted in strong support for the roll out of NeuRAtalks.org online seminar series to the national and rural population.

NeuRA Lights the Way



Video story online

neura.edu.au/magazine/neura-magazine-23/

A Vivid style lights spectacular lit up the NeuRA building during Mental Health Week. Mrs Margarete Ainsworth turned on the lights in a special launch event to mark the beginning of the NeuRA public seminars and events which delivered a wide range of presentations focused on mental health disorders.

Hip Fracture Registry Award



Video story online

neura.edu.au/magazine/neura-magazine-23/

Co-Chairs of the ANZ Hip Fracture Registry, Prof Jacqueline Close and Prof Ian Harris were honoured by the Health Services Research Award at Research Australia's Annual Health and Medical Research Awards. They proudly accepted the award on behalf of the ANZ Hip Fracture Registry, and said the award recognised the hard work of their entire team.



Prof Lars Ittner



Click here to meet Prof Lars Ittner

neura.edu.au/magazine/neura-magazine-23/

New Discovery in MND sparks hope

Senior Principal Research Scientist, Professor Lars Ittner is working to understand Motor Neurone Disease (MND), and trying to develop novel therapeutic approaches for this devastating condition.

Specifically, Prof Ittner develops disease models that allow his team to understand the detailed cellular events that lead to the dysfunction and death of neurons and therefore to the loss of motor function. These models also allow him to test new therapies, which he hopes will delay and eventually prevent this disease.

In a recent interview, Prof Ittner shared details of his current

research work, touching on new therapeutic directions and some exciting indicators.

Where is the future of MND research?

"I think that the future of MND has actually already started. It started with the bringing together of basic researchers like myself and clinicians, who deal on a day-to-day basis with the patients and their loved ones. We now develop research strategies together, instead of researching in separate streams, as it has happened for many years."

What was it like when you first came in contact with someone with MND?

"The first time I was in contact with MND I remember it vividly. It was when I was in my surgical training to become an orthopaedic surgeon, many years ago. A relatively young woman with knee pain came to our clinic and we diagnosed problems with reflexes which unfortunately

led very rapidly to a diagnosis of MND. Her whole world came tumbling down. It was a very emotional time for all of us in the medical team as we tried to support her grief. This event really ignited my research passion to want to understand what is really going on that leads to such drastic and rapid loss of motor functions and what can we do to stop it?"

Where has your research passion led you, and is there hope for any future breakthroughs?

"We have discovered in our animal models that there is potential for significant recovery from MND which is an exciting step, but we still have a long way to go.

Over the past 5 years or so, working with these models, it has been our clear intention to understand the mechanics that lead to MND. We actually got quite far on our journey to reveal the mechanisms of the degenerative process, when we made a discovery that really sparked hope for future treatments.

Specifically, we were able to genetically modify our disease models and that they actually stopped producing the toxins that lead to neuronal dysfunction. Amazingly, in two weeks these models recovered lost motor functions to a significant degree, and changed their behaviour back to normal.

So, while this is obviously not yet a treatment for patients, it clearly illustrates that we should be able to develop a treatment that is able to remove the toxins. We are excited to be at the beginning of understanding what drives MND, to allow the brain and spinal cord to recover function it has previously lost."

This suggests that the brain is capable of recovering partially from MND, which in itself is

a profound outcome of our research using models.

What are your future research plans?

"To develop a treatment for MND or even a cure, it is essential that we understand the mechanisms that underlie this devastating disease, so that needs intensive basic research in cellular models, animal models and translational research in patients, and a close collaboration with the pharmaceutical industry.

Research involving relevant disease models is unfortunately horrendously expensive. Therefore, we need the support of government bodies and industry, but also by the community to drive research in the direction of developing a new remedy and a cure for MND."

NeuRA Researcher Awarded Yamaguchi Medal



Dr Matthew Brodie

Dr Matthew Brodie was recently awarded the Yamaguchi Medal at the International Society of Biomechanics Congress in Brisbane.

The medal, presented by the Asian-Pacific Association for Biomechanics, for gait and posture research, was awarded for Dr Brodie's vision of using the latest wearable technologies, to take analysis of human performances out of the motion analysis laboratory and into daily life. Loss of mobility and a reduction in routine activities contributes to increased morbidity, metabolic disorder, cardiovascular disease and early mortality.

"At NeuRA's Falls Balance and Injury Research Centre, this new information is used to help develop new interventions aimed at improving the walking in people at high risk of falls; so people can remain mobile, independent, active and healthy - avoid serious fall injuries and stay out of hospital," said Dr Brodie.

The Yamaguchi Medal is awarded to promising young researchers who excel in their research.

Dr Yazi Ke

Dr Yazi Ke, is a group leader in the team of Prof Lars Ittner, and is currently a NHMRC Career Development Fellow. Dr Ke's research focuses on understanding the underlying pathomechanisms of MND. She uses a range of techniques to study molecular mechanisms in MND mouse and cell culture models.



Dr Yazi Ke



Video story online

neura.edu.au/magazine/neura-magazine-23/

Shin Liu

Shin Liu is a man you want to know... kind, articulate and with love in his heart.

At 57 years old however, Shin has planned his funeral. Two years ago, Shin was diagnosed with MND.

Listen to his brave and candid story about his progression through MND.



Shin Liu and family



Video story online

neura.edu.au/magazine/neura-magazine-23/



Prof Lynne Bilston & Dr Julie Brown

NeuRA launches new research into aged driver safety

Researchers at NeuRA are leading a new project to look at aged driver safety with the announcement of a new study to be led by Senior Research Scientist, Dr Julie Brown. With the support of the 2017 Ramaciotti Health Investment Grant, this study will be a world first investigation into the use of comfort accessories and seat modifications by older drivers where up to 25% are being found to use some adaptive comfort accessory.

Older Australians make up just 8% of licensed drivers, but account for over 14% of road fatalities. In a recent sample review of 380 drivers aged 75 years and older led by Dr Julie Brown it was found while all drivers wore seatbelts, over 25% also used an adaptive comfort accessory such as seat belt padding, seat base cushions, or back support.

Dr Brown highlighted that many of these could negatively impact crash protection and be **influencing the disproportional number of older Australians** being killed and injured in car crashes.

“Previous research into child safety in cars has shown such accessories have a detrimental effect on protection provided by a restraint in a crash.

“**No guidelines exist anywhere in the world**, which detail acceptable designs of comfort and orthopaedic aids to be used in a car,” said Dr Brown.

There has been no previous research undertaken to find out if these aids are being prescribed from a clinician, and what evidence exists to support the use of adaptive comfort aids in Australia’s aged driver population which is growing in line with ageing population trends globally.

By 2050 there will be more people living on the planet over 65 years



of age, than under which further confirms the important need to better understand how to keep aged drivers safe in the future to ensure independent living, mobility, and engagement in community activities.

“This study will examine the impact these aids have on crash protection and use the evidence to generate guidelines,” said Dr Brown.

The Aged Driver research program will be undertaken at the Transurban Road Safety Centre housed at NeuRA with results to be released in mid to late 2018.

Things you should know about sleep!

with Associate Professor Danny Eckert

- 1 40% of Australians are not getting enough sleep.
- 2 For all persons over the age of 18, it is recommended that you have 7-9 hours of sleep each night.
- 3 Children with poor sleep habits are 6 times as likely to be hyperactive than children with good sleep habits.
- 4 Just 17 hours of no sleep reduces work performance to similar levels to a 0.05 blood alcohol level.
- 5 About 12% of Australian men have undiagnosed moderate-to-severe sleep apnoea.
- 6 After menopause, women have similar rates of sleep apnoea to men.
- 7 An Australian community study found a four times higher rate of death for people with moderate-to-severe sleep apnoea (compared to no or mild sleep apnoea) over 20 years.
- 8 Inadequate sleep increases the risk of obesity, diabetes, stroke, and heart disease.
- 9 Men who get five hours sleep a night for a week have significantly lower levels of testosterone than those who get a good night's rest. Their levels are more akin to someone 10 years older.
- 10 Growth hormone is released almost entirely during deep sleep.



Watch Dr Hanna Hensen's Seminar on Sleep
neura.edu.au/magazine/neura-magazine-23/

Hip Fracture

the most costly fall-related injury suffered by older Australians



Prof Jacqueline Close & Prof Ian Harris



The Australian and New Zealand Hip Fracture Registry based at NeuRA, released its 2017 report highlighting hip fracture as the most serious and costly fall-related injury suffered by older Australians. In 2016, there were approximately 22,000 hip fractures in Australia with an estimated combined direct and indirect cost of \$908 million.

Commenting on the seriousness of these statistics, Prof Jacqueline Close, Geriatrician and Co-Chair of the Australian and New Zealand Hip Fracture Registry said “the number is set to rise to more than 30,000 by 2022, with a projected cost of \$1.126 billion”.

“Most importantly, the human cost from this injury is high: 5% will die in hospital; over 10% will be newly discharged to an aged care facility; more than 50% will still experience a mobility-related disability 12 months after injury; and up to 25% will have died in the year after discharge from hospital.”

The report highlighted the performance against national clinical care standards which have the potential to alter the outcome for some of the frailest members of our society.



Prof Debora Picone AM & Prof Close

Commenting on the findings, Prof Ian Harris, orthopaedic surgeon and Co-Chair of the Australian and New Zealand Hip Fracture Registry said,

“This report continues to show variation in the way we deliver care

to people with a hip fracture. Some of this variation between hospitals can markedly change the experience for the older person including how we manage their pain, timing of the surgery and the opportunity to start walking again after surgery”.

Further commenting, Prof Close said, “there remain huge opportunities to further improve care including the prevention of future falls and fractures. Strong evidence exists to support treatment of osteoporosis in this population yet there remains a care gap between what we are and should be doing.”

This care gap leaves hip fracture survivors with an increased risk of subsequent falls and fractures that are associated with loss of independence or ultimately increased risk of death.



74%

of hospitals reported having a hip fracture pathway

51%

across the whole acute hip fracture patient journey and

23%

in the emergency department only



56%

of hospitals responded that they had a pathway for pain management in the hip fracture patients

36%

across the whole acute patient journey and

20%

in the emergency department only

82%

of patients in Australia have surgery within



of presentation to hospital

27%



of hospitals reported providing written individualised information on discharge that describes ongoing patient recommendations for prevention of future falls and fractures

33%



of hospitals reported having access to a fracture liaison service for the systematic identification of fracture patients with the purpose of preventing further fractures



Dr Justine Gatt

The Neuroscience of Resilience



With over 75% of the population reporting at least one or multiple major traumas in their lifetime, it is imperative that we understand why some people are more vulnerable and go on to develop mental illnesses like anxiety and depression, and why some are more adaptive and resilient.

In the field of mental health, most neuroscience research to date has focused on understanding what determines risk for mental illness and ways to treat it. In contrast, there are only a handful of studies which have started to look at the neuroscience of resilience and how to promote it.

Dr Justine Gatt and her research team at NeuRA, for the first time, will aim to identify the brain profiles which predict pathways towards resilience versus risk for mental illness over time. The team are currently doing this in a large sample of 1,600 adult twins ranging in age from 18 to 60 years. To start with, she developed the first composite scale of wellbeing called the COMPAS-W which provides a combined measure of both subjective and psychological wellbeing.

The researchers are keen to test this measure in predicting patterns of resilience over time. To assist with this, Dr Gatt was recently successful in obtaining NHMRC funding to retest the twin sample 8 years after their initial characterisation. This study will be the first of its kind to show the neuroscience of longitudinal patterns of resilience (or risk) across adulthood. Beyond the current study in adults, the team is planning to extend these studies to adolescents and children.

Hear more about this research project and the science of resilience by watching Dr Gatt's seminar online at www.neurataks.org.



Video story online

neura.edu.au/magazine/neura-magazine-23/

A legacy of discovery



We recently shared with you the story of Keith and Lucille and their decision to donate their brains to the Sydney Brain Bank.

With Keith losing his battle with Frontotemporal dementia some years ago, today Lucille speaks with pride of the legacy of discovery he is creating. His precious gift makes research possible today, tomorrow, and for years to come.

We'd like to thank you for your gifts in support of the Sydney Brain Bank. With no government funding currently provided to this critical resource, we rely on the generosity of donors like you. From all the team, our most sincere thanks.

We would also like to thank the many of you who have made your own enquiries about brain donation. Your selfless decision is of significance, and will help us to *Discover, Conquer and Cure* for decades to come.

We remember them



What you have done for NeuRA in 2017 is amazing!

Your support this year, whether it be by donating, volunteering, fundraising, playing Bridge, deciding to leave a gift in your Will or becoming a *Discovery Partner*, you have allowed great research to continue.

This year we have had a number of supporters who, in their passing, supported NeuRA either by family and friends making a donation in their memory, or by remembering NeuRA in their Wills. We remember and honour each of them.

- Daniel Eric O'Brien
- Lynette Lennox
- David John Imrie
- Maree Kennedy
- Doug Mitchell
- Dylan Yves Morgan
- Nathalie Kulakowski
- Elizabeth Black
- Nazzareno Marinucci
- Gary McCarron
- Hugh Lambert
- Jane Josephine Holland
- Rhondda Clare Smart
- Jo Melville
- Rhys Gell
- Lily Rokvic
- Ryan Cottam
- Tim Warwick
- J. Gordon Pettigrew

It's time we said enough



It is unacceptable that we tolerate the growth of dementia in our communities. It is wrong to think that we cannot improve the way schizophrenia is treated. It is cruel when young men and women are diagnosed with motor neurone disease and rarely live for five years.

For great breakthroughs to happen, partnerships between scientists, government and research volunteers are critical. There is one further partnership however that is vital.

Yours. Welcome to *Discovery Partners*.

Discovery Partners help provide certainty to confidently plan for the future, by considering what they would like to give annually, and spreading that commitment over the 12 months of the year, via credit card or direct debit.

Best of all, *Discovery Partners* help build research teams, increase the number of clinical trials, foster more breakthroughs and most importantly of all, help move breakthroughs into cures.

To become a *Discovery Partner*, visit foundation.neura.edu.au/discoverypartners or complete the enclosed donation form, choosing 'monthly' as your giving frequency.

Sam's ride for hydrocephalus



Sam recently rode The Bowral Classic to raise funds for hydrocephalus research at NeuRA. The training and hills tested Sam's tenacity and strength, but the courage he sees in Angelina, his daughter who

suffers with hydrocephalus, was his inspiration. Rallying his family, friends and contacts, he raised over \$4,000. These funds will support research at NeuRA where, in a world first, our research team have characterised how brain tissue stiffness changes during the development of hydrocephalus in the deeper brain regions. This unique finding paves the way to develop stiffness indices that can be used to guide treatment prognosis, thereby improving the clinical management of patients.

NeuRAtalks

online seminar series



NeuRAtalks Online is a series of seminars brought to you by NeuRA which brings new information on neuroscience research and translational science to the community. Available online, new seminars are released weekly.

In this issue of the NeuRA Magazine we feature Prof Cyndi Shannon Weickert's talk *Freedom from Schizophrenia*, where she describes some of the details of schizophrenia, where the research has been going and her recent ground-breaking discovery which may just reveal a new line of treatment never before considered.

To watch her talk and many others, on topics ranging from bipolar and depression to sleep, go to www.neurataalks.org.



Video story online
www.neurataalks.org

DONATION & RESEARCH VOLUNTEER FORM

All gifts over \$2 are tax deductible

- Yes, I would like to donate to research at NeuRA
 Yes, I am interested in participating in research at NeuRA

Title:

First Name:

Surname:

Address:

Suburb:

State:

Postcode:

Phone:

Email:

Step 1: How I choose to give my gift:

- Please accept this one-off gift to support research at NeuRA
 I would like to invest in the future and become a *Discovery Partner* with a regular donation of \$ _____ monthly / quarterly (*please select*)

\$50 \$100 \$250 or

A cheque payable to the NeuRA Foundation is enclosed OR

I wish to make my gift by credit card:

Visa Mastercard American Express Diners

Card No:

Expiry Date:

Cardholder's Name:

Cardholder's Signature:

Please send me:

- Details about how I can support NeuRA in my Will

- Mail this coupon in the reply paid envelope
- Call us on **1300 888 019** to make a donation over the phone
- Make a secure online donation at neura.edu.au/donate

A message from the NeuRA Foundation: The NeuRA Foundation may co-operate with other like-minded reputable Australian charities to promote our work to our respective donors. If you'd prefer that NeuRA does not share your information with other charities, please phone us on **1300 888 019**, email us at foundation@neura.edu.au or write to us using the enclosed envelope.

Thank you for generously supporting our research into diseases of the brain and nervous system.

Prof Kaarin Anstey

joins NeuRA and UNSW to lead an innovative national research agenda on ageing and dementia



Professor Kaarin Anstey joins NeuRA in January 2018 to lead an innovative multi-disciplinary team addressing ageing research, with a focus on vital community lifestyle solutions around dementia in the Australian community.

Speaking about her new appointment, Prof Anstey said, "I'm looking forward to expanding my research programs on the epidemiology of cognition and dementia with a focus on identifying lifestyle, brain, and biological risk factors that lead to cognitive decline, and the impact of cognitive ageing on everyday function and safe driving in the individual and broader community.

"I am also interested in how cognitive decline impacts on the capacity individuals have to make good decisions about their finances and health. I look forward to working

more closely with new and existing colleagues," said Prof Anstey.

In context, by 2053, 21% of the Australian population will be aged 65 and over (8.3 million people) and 4.2% aged 85 and over (1.6 million people). This unprecedented demographic shift will result in dramatic changes in the need for health and care services.

It highlights a critical need for preventive health approaches and interventions to enable older adults to retain their independence. Of those aged 65+, 20-25% will have some degree of cognitive impairment, with 5-7% developing dementia.

Prof Anstey believes there is huge scope for research to improve how people age through preventive health strategies, the use of technology and specific skill training. Using

psychological and population health approaches, her research programs focus on interventions to reduce risk of dementia, cognitive ageing and decision-making, interventions to improve driving skill, and longitudinal studies of health and ageing.

Over the next five years, Prof Anstey will focus on four key projects including: the development of a global research network for dementia prevention and building the evidence-base on risk and protective factors for cognitive decline and dementia; physical and mental resilience in ageing; how cognitive decline impacts on decision-making; and how to keep older drivers on the road for longer, safer and more independent.



Video story online

neura.edu.au/magazine/neura-magazine-23/

By 2053

21% of the Australian population will be aged

65 and over
(8.3 million people)

and **4.2%**

85 and over
(1.6 million people)

Of those aged 65+

20-25%

will have some degree of cognitive impairment, with

5-7%
developing dementia.



By 2025

the total cost of dementia in Australia is predicted to increase to

\$18.7 billion
in today's dollars

and by 2056 to over

\$36.8 billion

Thank you for your support

If you wish to update your preferred communications from NeuRA, please call 1300 888 019.

NeuRA (Neuroscience Research Australia) Foundation
T 1300 888 019 F +61 2 9399 1082
ABN 57 008 429 961

Margarete Ainsworth Building
139 Barker Street, Randwick NSW 2031 Australia

www.neura.edu.au

