Huntington’s disease and depression research

One of the Florey’s young stars, Dr Xin Du, has won a prestigious award at the Australian Neuroscience Society’s annual meeting. The award commemorates the late Australian Professor of Physiology, Mark Rowe, and is presented annually for the best publication by an early career researcher.

Xin Du has been recognised for investigating the frequent symptom of depression in Huntington’s disease, an incurable genetic illness that results in inevitable mental and physical decline.

Dr Xin Du

The reward was for research undertaken as part of his PhD studies with Associate Professor Anthony Hannan’s Neural Plasticity team. The winning publication was the first to show three points of interest in Huntington’s disease. Firstly, female Huntington’s disease patients may be particularly susceptible to developing depression—a theory supported by recent evidence that found female patients suffer a higher frequency of depression.

Secondly, although the mutant gene in Huntington’s disease is expressed in virtually all parts of the body, the vast majority of scientific attention has been focused on the brain. The finding of adrenal abnormality highlights the need to examine peripheral organs that can greatly influence brain function and wellbeing.

Finally, studies show the success of environmental enrichment in improving symptoms demonstrating the tremendous potential of non-pharmacological ways to treat or avoid depression. They include motivational therapy, a healthier lifestyle and more exercise.

Jess Nithianantharajah has travelled far and wide since completing a PhD at the Florey. Behavioural neuroscience is her passion and she uses touch screens, like iPads, to test complex learning skills. Her career has taken her to Cambridge and Edinburgh where she worked with the renowned Professor Seth Grant at the Wellcome Trust Sanger Institute. Armed with a wealth of experience and contending where to establish her research group, Jess has decided to return to Melbourne to the Florey.

“My father was a university lecturer with expertise in botany and agriculture, so I grew up in a household with a strong enthusiasm for the sciences. In addition, I had a natural curiosity to question how and why things were the way they were, and to try and figure these out.

I always wanted to understand how the brain controls behaviour because, although we all perform a varied and complex set of behaviours and mental processes, very little is known about how this actually works. Genes are the template from which our diverse behavioural capacities are derived, and my recent research has focused on understanding how the genes that are required for forming the connections between brain cells control complex behaviour and mental processes.

An exciting aspect of my recent studies was working with the lab in Cambridge that developed iPad-like touch screen computers to test animals on complex learning tasks very similar to that used in the clinic with patients. These tests target different aspects of cognitive functioning and different brain regions, particularly the hippocampus, prefrontal cortex and striatum. They have advanced how we can model complex mental processes in animals, and have immense significance for medical translation through better identification with relevant brain networks in humans and also by speeding the process.

“Compared with previous models, this new form of assessment has three main advantages. First, the tasks are in themselves more representative of the tasks used to measure cognitive deficits seen in patients; in many cases, virtually identical paradigms and methodologies can be used. Second, the tasks are carried out in the same apparatus, using the same type of stimuli, with the same rewards, and requiring the same responses, thereby controlling for many potential errors. Finally, there are a number of practical advantages: many animals can be tested simultaneously, experimenter contact with animals during testing is minimised, and many different behavioural measures are possible. I am planning to extend and develop work with touch screen assays at the Florey, with the goal of making the institute a leader within Australia in this technology.”

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Funding boost for MS researchers

Veteran and mid-career researchers are receiving vital funding for research into multiple sclerosis, thanks to MS Research Australia.

Three researchers have received a total of $442,000 to further our understanding of this crippling disease affecting nearly 24,000 Australians.

Multiple sclerosis (MS) is a disease of the central nervous system in which the myelin (fatty insulating sheaths protecting nerve fibres) becomes damaged and scarred. This impairs how well nerves conduct impulses, affecting a person’s motor, sensory and even cognitive functions. The causes of MS are unknown, but genetic and environmental factors are suspected of having some role.

Three quarters of those living with MS are female.

Richard Bedford, Professor of Medicine at the Florey, said: “Three quarters of those living with MS are female. Environmental factors are suspected of having some role. The causes of MS are unknown, but genetic and environmental factors are suspected of having some role.”

Professor Trevor Kilpatrick leads the Florey’s MS division and has been awarded $292,000 to continue his world-recognized research into the functional implications of genetic variation in a specific gene called MERTK and its role in MS susceptibility.

Dr Simon Murray received $180,000 and will be deepening his understanding of the growth factor BDNF, investigating its potential to promote myelin regrowth in MS.

Dr Stan Mitew and colleague Dr Ben Emery received $150,000 to investigate whether mechanisms for myelination that occur during development can be reactivated to enhance myelin repair in MS.

The Florey thanks MS Research Australia for its vital role in increasing the capacity for MS research by supporting fundamental research.

Associate Professor David Howells

And you thought ‘waste’ simply involved the complexities of household recycling! The Florey’s Associate Professor David Howells (and colleagues) has recently co-authored a paper for the Lancet journal on the need to increase value and reduce waste in scientific research.

The Florey is an economically responsible organisation, constantly analysing ways to make our funding stretch as far as possible. Enter David Howells.

“Global investment in biomedical research is increasing, reaching $US524 billion in 2010,” David says. For some, it can seem hard to appreciate the value of lab-based science when there is not an immediate benefit. But basic science is by its nature incremental, requiring a methodical and dedicated approach.

“At the Florey, we are determined to avoid waste and as part of a global analysis, my colleagues and I have taken a helicopter-view of research practices and hope we offer some invaluable insights to the whole sector.”

In research, waste occurs when study results are not reliable and cannot be replicated. Biased and overoptimistic reporting of underpowered experiments can lead generations of researchers down the wrong path. However, lack of statistical power also leads to false negatives, crippling potential breakthroughs.

“One of the rewards for funding my research (to the tune of $500) was the ability to name a virus in someone’s honour – with their name being part of history in scientific publications around the world.”

David’s passion and commitment to this issue is set to have international ramifications for the sector.

Reducing waste in research

The Florey invited generous donor, Linda Carmody to write for Brain Matters

“My beautiful friend, Myra Mitchell, passed away 13 August 2009. She was the kindest, funniest, most loving person I have ever met. I adored her with all of my heart and am so grateful for the times we spent together.

“Myra left me a small sum of money, and the dilemma about how to use it, was underlying treatment for breast cancer at the time, and Myra paid for my radiation but I had some left over. I’ve been waiting for the right solution to present itself.

“And then we saw Dave Hawkes on ABC Breakfast TV talking about the Florey Institute and offering naming rights for viral vectors. It was a perfect match. I was thrilled that Dave was offering an affordable opportunity to remember Myra in such a unique and wonderful way, and also to share in the medical research on an ongoing basis.

“Myra spent the greater part of her life in the service of others. She formed and faithfully conducted various groups to support grieving partners, single mothers, the elderly, war veterans as the need required. She would have loved the idea of viral vectors and the part they play in advancing our understanding of brain functions. She would have loved to be part of finding a better treatment, or a cure, through research. She just loved folk and would have done anything to help anyone.

“For my part, I can follow the viral vector named Myra into the future. I anticipate the thrill of reading that Myra’s viral vector was involved in making advances in the treatment of MS, or Parkinson’s, or any of the many uses to which it may be put.

“And I can imagine Myra, behind the scenes, still doing what she loved best, helping others.”

If you would like more information about the Florey’s upcoming Pozible campaign, please call Jane Standish on (03) 8344 1824 or visit the Florey website at Florey.edu.au.

By Dr David Hawkes:

Late last year, I participated in the Florey’s inaugural crowd-funding project to help finance my research. I was hoping to raise $12,000 through Pozible which, I’m happy to report, I did!

“One of the rewards for funding my research (to the tune of $2,500) was the ability to name a virus in someone’s honour – with their name becoming part of history in scientific publications around the world.”

As a virologist, I help the Florey’s researchers investigate the causes of brain diseases. I create special types of non-infectious, non-disease-causing viruses called viral vectors. The human brain contains over 100 billion cells, divided up into over 1000 different regions. Up until recently this has made studying the specific function of cells in the brain very difficult. But these little “toolboxes” can be sent into the body, told to enter cells and to change the way the cell behaves. They might make cells more or less active, or produce more or less of a specific protein. New information gathered allows us to understand how the brain works and what happens when things go wrong. The end goal? To contribute to better treatments and to prevent brain diseases and conditions.

“Viral vectors have had a crucial role in allowing researchers to use newly developed genetic technologies in the brain. Our lab is currently using viral vectors to deliver the ominous sounding DREADDs (Designer Receptors Exclusively Activated by Designer Drugs) to either turn-on or turn-off a small region of the brain for up to eight hours. These DREADDs are being used to investigate how our brains regulate many of our daily activities like eating, sleeping or our responses to stress. They are helping our understanding of multiple sclerosis, epilepsy and stroke to name a few.

Crowd-funding uses the power of thousands of individuals who each donate a small amount to help create a large sum for a worthy cause. The Florey ran its first crowdfunding campaign late last year and it was a great success. We featured several unique scientific projects and raised more than $70,000 over a few months. The scientists were blown away by the support received from new donors who hadn’t engaged with the Florey in the past – as well as from those who have a long history of support for our work.

The Pozible campaign also generated a huge amount of media interest, raising our profile both in Australia and internationally.

The story, below, demonstrates how scientist and donor can connect in a wonderfully collaborative way.

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Members of the Dowd family recently visited the Florey's Parkville campus to speak to the Dowd Foundation Research Fellowship for Neuroscience.

Dr Chris Reid, the head of the Snapdragon Lab, is the honoree recipient of the $300,000 fellowship which is designed to support extraordinarily talented researchers who have not yet been awarded an NHMRC senior research fellowship, but are of the calibre to be successful career researchers.

The Dowd Family is committed to supporting excellence in research, and this sense of loyalty the family felt to long-time Florey researcher, Wendy Dowd acknowledged the important work being done and the need for the fellowship to support extraordinarily talented researchers who have not yet been awarded an NHMRC senior research fellowship, but are of the calibre to be successful career researchers.

The Dowd Family has a long and proud history of supporting research excellence in Melbourne, and the Dowd Family's decision to support neuroscientists of outstanding calibre to be successful career researchers.

Geoff Tregear. Chris Reid was the unanimous choice.

“Perfect storm”, according to those in the field. Huge advances often come with the disease. “It’s tragic that one-third of those can suffer the social isolation and stigma that people with Parkinson’s disease live with,” Chris says. After a lifetime of hard work and achievement, we all hope that our effort can continue to count for something, and perhaps give hope to others.”

“In this case, it’s our love for our son, River, who died of SIDS in 2011. Friends and supporters will jump on board, represent the cause and fundraise if you would like to know more about how you can help our scientists to make a difference, please call our bequest officer for a confidential discussion,” Fiona Bright said.

After a lifetime of hard work and achievement, we all hope that our efforts can continue to count for something, and perhaps give hope to others who suffer the social isolation and stigma that people with Parkinson’s disease live with. We all hope that our effort can continue to count for something, and perhaps give hope to others who suffer the social isolation and stigma that people with Parkinson’s disease live with.

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Improving lives through brain research

Vale Julie Donlon

It is with great sadness that we farewell Julie Donlon, wife of the Florey’s Parkinson's research supporter Kieran Donlon. Julie died in March whilst walking her dog near Yarrawonga.

Julie and Kieran Donlon

Alongside Kieran, Julie bravely raised awareness of Parkinson’s disease even as she fought her own battle. Kieran cycled more than 4,000 kilometres from Cairns to Warnambool in 2011 to raise funds and awareness for our research into Parkinson’s, and followed that by riding around Albert Park Lake for 24 hours in 2012. More recently, the couple had been travelling around the country and speaking to community groups.

Diagnosed at only 38, Julie always faced her disabilities with enormous courage and Kieran was exceptional in his care of her. Julie touched on that support in an interview with the ABC in August last year: “I try and do things myself, but when I can’t, Kieran is always there,” she said.

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Help for today and tomorrow – exploring research developments and advances in treatment

The Florey has partnered with Parkinson’s Victoria to present a public lecture to commemorate World Parkinson’s Day. The Florey’s series will inform patients and their carers of the latest in Parkinson’s research and treatment options. Content will be new so if you’ve attended before, feel free to come again.

Date  Thursday 10th April

Time  Refreshments will be served in the foyer from 6:00pm

Venue  Kenneth Myer Building, 30 Royal Parade Parkville

The speakers for the evening are:

Professor Mag E. Morris, physiotherapist, Allied Health, LaTrobe University

Help for today – exploring current treatment options and innovations in Parkinson’s therapy

Professor Mal Horne, neurologist and researcher at the Florey

Help for tomorrow – exploring research developments and advances in treatment

This event will be filmed and popped onto our website in the weeks following the event.

TREAD memory research

Older people concerned about their memory can become involved in Florey research using web-based memory assessments.

If you are over 50, visit: tread.florey.edu.au

Thank you

The Florey thanks our recent donors who kindly donated $5000 or more between August and February.

Charities: Alzheimer’s Drug Discovery Foundation • ANZ Banking Group Limited • ANZ Trustees Limited • Kevin & Pam Barrham • Philip Barron • Chris Barr • William Booker • Bean Family Foundation • John Blanch • Tim & Sue Bapho • Dick Boulter • Michael Bourne • Graeme Bowker • Christine Boyle • Brain Foundation • Elizabeth Butt • Janet Carr • C M Carrigan • John & Chris Collingwood • CWA Noble Park Branch • Brian Davis • Ernest Dawes OBE • Eril Deighton • Matthew Delasey • Erin Devlin • Dixson Trust Pty Ltd • Andrew Erikson • Ed Prendergast • Reece Australia Ltd • Stephen & Leesa Rix • David Shaw • Peg Smart • Betty Smith • Bob Smith • Nick Smith • Betty Stinson • Takako Subocz • Sylvia and Charles Viettel Charitable Fund • Greg & Wendy Taggart • B & P Teague • Testina Run • Texas Biomedical Research Institute • Kathryn Thomas • The Eirene Lucas Foundation • The Florek Fund • The Great Ocean Run Foundation • The Janfooter Family Foundation • The Punt Foundation • The William Angliss (Vic) Charitable Fund • Joan Thomas • Marjana Todd • Robert Thrower • Trust Company Ltd • Unilex Pty Ltd • David Vernon • Michael Walker • Erin & Barbara Wheaters • Janet Whitng & Phil Luker • Margaret Wilson • Robin Wilson

Donations in memory of

Robert Charles (Bob) Atkins • Donna Teresa Blake • Kenneth Varie Connolly • Julie Donlon • Stuart Duffy • Marcin Gabrielski • Mural Gardiner

Odhisra Glines • Wd Nanaimo • Neil (Harry) Robertson • Dr. William Bendfeld • Stephenia • Arlene Subach • Robert (Bob) Wardlaw

Gifts in celebration of

60th Birthday of Noel Prestney