Welcome home from St Louis, Dr Yen Ying Lim
Winner of a major Alzheimer’s Australia fellowship
Another year is in full swing here at the Florey. Our scientists are immersed in the challenges of applying for federal grants while quietly supporting the work for the Medical Research Future Fund. This potentially game-changing initiative will not only continue to provide desperately needed funds for ongoing programs, but will provide a much larger pool of funds to enable scientists to take even bolder steps in their research strategies. This often produces those quantum leaps in our understanding of disease processes that are so desperately needed if we are to make real progress toward cures for some of the most challenging conditions in our society today.

This year, the Florey promises increased interaction with our Brain Matters readers. We have received a number of public lectures in our stunning auditorium. We will continue to film each talk so you can watch from home on your computer if you can’t make it to the Parkville campus. Topics will include depression, schizophrenia, epilepsy, addiction and Alzheimer’s disease. There’s more information in the flyer that accompanies this newsletter.

The late Dr Alan Rembach

worm regards,
Professor Geoffrey Donnan, AD
Director, the Florey Institute of Neuroscience & Mental Health

A NAC for rescuing brain cells

Experimental laboratory research at the Florey, aimed at treating Huntington’s disease, has uncovered a potential treatment for depression for a wider section of the community.

The finding involves the complex-sounding N-acetylcysteine (NAC) which comes from an amino acid, the building blocks of proteins. NAC is used widely in medicine for many conditions, is readily available and safe for clinical use.

The collaborative research team, led by Professor Anthony Hannan and Dr Laura Gray, has found that NAC actually rescues cells damaged by Huntington’s disease in animal studies. Movement problems are eased when NAC is given regularly.

It may delay Huntington’s disease and slow decline because NAC is thought to protect nerve cells which are excessively stimulated and stressed as part of the disease process.

According to PhD student, Dean Wright, and Dr Thibault Renoir, depression is a common problem for those living with Huntington’s disease. Significantly, NAC appears to have an antidepressant effect on animal models.

The team from the neural plasticity lab has a strong track record in the field, having proven exercise and cognitive stimulation can delay the symptoms of progressive brain disorders, building a “reserve” to protect those who are yet to show signs of decline.

Huntington’s disease has an enormous effect on families with each child of an affected parent having a 50 per cent chance of inheriting the defective gene. Those who inherit the gene will inevitably develop symptoms, usually between the ages of 30 and 50. They experience progressive deterioration of movement and cognition, eventually leading to incapacitation and death approximately 15–25 years after onset.

The latest research will offer hope for people other than those living with Huntington’s disease, but who suffer depression. “It’s well established now that people affected by depression benefit from physical activity,” Tony says. “And our past research has built on this, showing that not only the brain, but other organs including the adrenal gland can benefit, long-term, from cognitive and physical activity.

“Now we are working towards NAC having a role to play as well. Before this discovery, people talked about Huntington’s being 100 per cent genetic. But suddenly, with this and other genetic disorders, there is this idea that by providing more cognitive stimulation and exercise, you may actually delay disease onset and progression.”

The team is now working towards developing an ‘environmental’ drug to mimic the beneficial effects of exercise and mental stimulation as a protection for those at high risk of dementia, depression and Huntington’s.

If you would like to help Prof Hannan continue this groundbreaking work, please contact Margot on 03 8344 9679.
A lot has been written about dementia in recent times. Governments fear the looming costs as our population ages and baby boomers understandably fear the unknown as they age. Medical researchers at the Florey have been working on this dreadful disease for many years, headed by two leading figures in the international fight, Professor Colin Masters and Professor Ashley Bush. Here, we discuss the latest news and developments in this complex field of research.

As many of us know, dementia is the gradual but serious loss of cognitive ability that results in confusion and a permanent loss of short and eventually long-term memory, as well as emotional changes like depression and aggression. It is a devastating condition that robs people of their very identity.

It is estimated that by 2050, 900,000 people in Australia will be living with dementia, of which Alzheimer’s disease is the most common form. Costs associated with the disease are projected to reach $83 billion by 2050. Age is the biggest risk factor for developing Alzheimer’s disease, with the average age of onset being 80 years.

The ‘frontline’ of Florey’s human diagnostic research is the recently opened brain imaging unit. The imaging unit is home to a PET/CT scanner which is used to identify a build-up of amyloid protein in the brain. This is a common indicator of Alzheimer’s disease and was identified by Prof Masters back in the mid 1990s. The imaging unit also contains the most powerful MRI scanner in the Southern Hemisphere, offering unprecedented views inside the living brain. These scans are critical in measuring the brain shrinkage associated with Alzheimer’s, especially in an area called the hippocampus (Latin for seahorse) involved in forming new memories. Brain cell death in this area is the reason for the short-term memory loss in dementia.

Alongside the imaging unit, the Florey also plays a major role in identifying and correlates this with biological markers of the disease in blood and spinal fluid, as well as lifestyle factors that may influence the progression of the disease. There is no other study in the world with such high-quality data collected over such an extended time frame.

The AIBL study has shown that toxic amyloid protein can be detected building up in the brain 30 years before dementia symptoms become evident. This information is crucial in designing clinical trials that enroll the appropriate people, as there’s no point enrolling people in treatment trials if they were never going to go on and develop the disease.

On the treatment and intervention front, the Florey is involved in the Dohmann Inherited Alzheimer Network trial and another, the A4 trial (Anti-Amyloid Treatment in Asymptomatic Alzheimer’s disease). These trials are using experimental drugs that bind to and ‘block’ the amyloid peptide in the brains of people who are most likely to develop Alzheimer’s due to a genetic history, or who already have higher-than-normal levels of amyloid peptide. Melbourne is the only Australian arm of the A4 trial (see below for enrolment details).

Future trials at the Florey will also look at lifestyle changes that might slow the progress of the disease. Most people are familiar with the benefits of quality sleep, mental wellness and cardiovascular health, but evidence now points to the beneficial effects of these in reducing amyloid buildup, and thereby improving short-term memory and other cognitive abilities. Along with an ‘active mind’, these factors may reduce 30 per cent of the Alzheimer’s disease burden, so living well is not just good for your waistline and your heart, it’s undoubtedly good for your brain as well.

An emerging theme of dementia research is the role played by metals in the brain. Professor Ashley Bush, who won the 2014 Victoria Prize for Science, has shown that as well as the buildup of amyloid peptide, Alzheimer’s brains have abnormally high levels of metals such as iron, copper and zinc, and that oxidation – rusting – of these metals is responsible for significant cell death, causing and exacerbating dementia symptoms. Professor Bush’s lab has designed and tested drugs that ‘chaperone’ these metals out of the cell, lowering the overall levels and restoring normal metal balance. These drugs are in clinical trials now with promising results due soon.

Professor Bush said of this research, “I’ve been looking at this problem for a quarter of a century, and we now understand a great deal more about the biochemical connection between the accumulated beta-amyloid in the brain and the chemistry of brain metals in Alzheimer’s disease, and in ageing. For example, that the proteins implicated in Alzheimer’s disease all function in order to regulate the levels of metals within the brain, and these metals are essential for healthy brain function. We have, in partnership with commercial biotechnology companies, several candidate drugs that are out there being tested, and so far it’s looking good.”

Professor Masters is similarly optimistic for the future. “The solution to Alzheimer’s is likely going to involve some sort of combination therapy, similar to current cancer chemotherapy treatments. “This might involve inhibiting formation of the peptide, promoting peptide clearance back to normal levels, maintaining proper metal homeostasis and improving overall cardiovascular health.

The star of this research is the Australian Imaging, Biomarkers and Lifestyle study of aging (AIBL), in collaboration with the CSIRO and a number of Australian universities and institutes. The AIBL study is following 1000 Australians as they age, trying to describe the first ‘natural history’ of this disease in the more than 100 years since the first patient was diagnosed by Alois Alzheimer. The AIBL study measures the buildup of toxic amyloid in the brain through imaging, and correlates this with biological markers of the disease in blood and spinal fluid, as well as lifestyle factors that may influence the progression of the disease. There is no other study in the world with such high-quality data collected over such an extended time frame.

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The "ravages of dementia" could wipe out much of the hard-won health gains of the 20th century, World Dementia Envoy Dennis Gillings warned when visiting the Florey recently.

"The total burden of amyloid protein in the brain is a measly 10 milligrams. We should be able to clear 10mg of peptide, it is by no means an insurmountable problem. With an average age of onset for Alzheimer’s of 80 years, if we can delay that onset even by just five years, we’ll make a huge impact on the lives of sufferers and their supporters.”

To enrol for the A4 trial, complete the survey at www.florey.edu.au/research/clinical-research-group/a4trial, or call (03) 9496 3326.
**Save a minute – save a day**

Paramedics and emergency department staff in the nation’s hospitals are being encouraged to rush suspected stroke patients through triage in an effort to see if they qualify for urgent access to brain imaging for suspected stroke.

A world-first study by the Florey and international researchers has found that every minute saved translates into days, weeks and months of disability-free life.

In fact, giving a stroke victim a clot-busting drug just 15 minutes earlier would give them one more month of healthy life.

A stroke occurs when clots block blood flow to the brain, leading to cell death and brain damage.

The faster the clot-buster (tissue plasminogen activator) dissolves the clot, the less chance of disability.

The faster the clot buster (tissue plasminogen activator) dissolves the clot, the less chance of disability. The study, with the Florey’s and Royal Melbourne Hospital’s cooperation, has found that every minute counts when it comes to stroke treatment.

A lab tour goes behind the scenes

When the Florey presented a talk on estate planning by well-known Melbourne barrister David Whiting recently, participants were invited to enter a competition with a special prize – a personal tour of the Florey and the chance to meet some of the scientists who work here.

Robyn Browne was thrilled when called to come in to our Parkville labs. She is pictured here with Dr Jhodie Duncan, a senior researcher in the Florey’s Behavioural Neuroscience group. Dr Duncan is currently investigating the effects of adolescent inhalant abuse on the maturing brain of adolescents, a growing socio-economic concern.

She is also touched on the impact that donations and bequests from supporters like Robyn can have on medical research. After the tour, Dr Duncan talked to Robyn about her research and the potential benefits to the community. The conversation also touched on the impact that donations and bequests from supporters like Robyn can have on medical research.

There will be more opportunities to hear from a variety of guest speakers talking the Florey five year and more changes for our supporters to see behind the scenes tour.

If you are considering a major gift such as a bequest, and a visit to the Florey, please contact us.

**Mark and Leonid have identified ways to help us respond faster to childhood stroke**

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**Professor Norman Doidge to speak in Melbourne**

Join the Florey as we host a very special evening with the fascinating psychiatrist Norman Doidge, author of the New York Times international best-seller, The Brain That Changes Itself.

His new book, The Brain’s Way of Healing, will be discussed with a panel of Florey scientists who have been interviewed for this latest book. The discussion will focus on treating brain injury and illness through neuroplastic healing. In his new book, Norman explores cases where patients have alleviated years of chronic pain or recovered from debilitating strokes or accidents. He studies children on the autistic spectrum or with learning disorders and those who have experienced improvements in symptoms due to multiple sclerosis, Parkinson’s disease and cerebral palsy.

Come along and ask a question or simply listen.

**Date**
Wednesday May 27. 6pm-8pm

**Where**
Melbourne Town Hall

**Bookings**
Website florey.edu.au

**Further information**
Email info@florey.edu.au
Phone 1800 063 693

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**Florey AGM**

The Florey’s annual general meeting will take place in the auditorium at our Parkville campus.

**Date**
Thursday May 28. 5pm-7pm

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

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

**Transport**
Tram 19, Stop 11 heading away from the city, right outside The Florey’s annual general meeting will take place in the auditorium at our Parkville campus.

**RSVP**
Margot on 03 8344 9679

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**THANK YOU**

The Florey thanks our recent donors who kindly donated $500 or more between August and December 2014.

Jen & Judy Allen • AMP Foundation • The William Angliss (Vic) Charitable Fund • AWA Banking Group Limited • Australia Post • Australian Communion Foundation (Ralph and Betty Sims fund) • Will & Dorothy Bailey Charitable Gift • Mr Ross Barker • Mr & Mrs Roger & Jennifer Beer • Cabrini Health • The CASS Foundation Ltd • CFMU • CSU Foundation • Mr Sue-Carp • Ms Barbara Colman • Walter Cottman Endowment Fund • Mrs Barbara Darvell • Mrs Eni Diegston • The Dixon Foundation • The Drummond Foundation • Essendon Football Club Past Players & Officials Association • Mrs Anne Foste • Mr Robin Foste • The Florey Foundation • Mr & Mrs Kew & Pat Micalle • Estate of Juan Mary McPherson • Mrs Judith Mildelmanns • Ms Suzanne Morgan • Mr Richard Munt • Dr Mark Nelson • Mrs & Mr John & June Nixon-Smith • Pakenham Opportunity Shop • Mrs Keith Patterson • Peter Moyers Anglican Community School • Dr K Pearson • The Ian Potter Foundation • The Olivo & Vera Rancefcott Foundation • Mr Alan Rice • Mater-Clinic of Queensland • Salvation Army • Maxi Kelly Smith • Mr Betty Stinson • Dr Christopher Sweeney • Tintin Community Program • Mrs Kathleen Thaiday • Sylvia and Charles Viertel Charitable Foundation • Michael Walker • Mr Keith Williams • Mrs Simone Winter • Mr & Mrs Michael Yales

**Donations in memory of**

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Angeles Pavlikos
June Payne
Ellen May Mabel Party
Brent Proctor
Elsa Maria Serrit
Hans von Strokirch

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**Celebration of Annie Smithers’ Xmas donation**

The Florey sends a special thank you to chef Annie Smithers of du Fermier restaurant in Trentham who auctioned a special Xmas dinner for 15 to raise $1500 in aid of research. Many of Annie’s suppliers and industry friends generously donated supplies and time to ensure funds raised could all be gifted to the Florey. Thank you to:

- Dechene Bakery
- Bundarra Berkshires
- Miling yard Farm
- Piper Street Food Company
- Cheese Cultures
- Hanged Rock Hens
- Warialda Beef - beef
- Myrtleford Butter Factory
- Watts Fresh Fruit & Veg
- Melior Farms
- Monica Rose
- Michel’s Fine Biscuits
- Kitchen Beaver
- Eastern Peak Vineyard
- Red Beard Bakery

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**World Parkinson’s Day Lecture**

Annual Public Lecture in collaboration with Parkinson’s Victoria. Guest speaker: world-renowned Parkinson’s researcher, Dr Ted Dawson from John Hopkins Medicine.

**Date**
Wednesday April 15, 6pm

**Where**
RACV Club, 501 Bourke Street, Melbourne

**Bookings**
Website florey.edu.au

**Further information**
Email info@florey.edu.au
Phone 1800 063 693

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**For more information contact the Editor, Amanda Place:**

amanda.place@florey.edu.au or +61 411 204 526

Visit the Florey website (http://www.florey.edu.au) and Facebook and Twitter at our website: florey.edu.au

The Florey Institute of Neuroscience & Mental Health is the amalgamation of the Howard Florey Institute, the Brain Research Institute, The Mental Health Research Institute and the National Stroke Research Institute.

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