AFTER YEARS OF DIFFERING DIAGNOSES AND MYRIAD MEDICATIONS, MICHAEL WAS REFERRED TO THE FLOREY NEUROLOGIST PROFESSOR GRAEME JACKSON, WHOSE NOVEL APPROACH TO BRAIN IMAGING HAS CHANGED MICHAEL’S LIFE.

(CONTINUED PAGE 3)
DIRECTOR’S MESSAGE

Dear friends,

I am pleased to report our Austin staff members have settled into their new laboratories at Redcliffe. We are already attracting headlines for the pioneering work being done there. Both the ABC’s 7.30 and The Age have visited in recent weeks to report on important advances being made in the areas of stroke and epilepsy.

The Parkville building is almost complete and in the coming weeks Florey staff will co-locate with their university counterparts and colleagues from the Mental Health Research Institute. Great work will happen in these superb new facilities. We are destined to attract even more international talent when we provide such a rich research environment. We continue to be grateful to those generous sponsors who help us fulfill our research mission in these world-class laboratories.

Just as we expect to become a magnet for international neuroscientists, so we must farewell some of our bright young researchers in what is an essential rite of passage for a career scientist – a stint overseas for post-doctoral research. In this edition, you will meet Dr Bianca Jupp, a very talented member of Professor Andrew Lawrence’s Addiction Neuroscience laboratory. Bianca is off to Cambridge on a scholarship but will return to continue her work in Australia in about three years’ time.

I am pleased to report we have been very successful in our quest to win competitive grants through the NHMRC and ARC funding streams. Most recently, we have attracted over $13 million in new competitive NHMRC and ARC funding streams. Most recently, we have attracted over $13 million in new competitive funding, but, as always, we cannot rely on government funding alone when budgets tighten and natural disasters take their toll on the public purse.

As you will see in this edition of Brain Matter(s), our brains use electricity to think, but also like a spark of life into Adam on the Sistine Chapel ceiling. Like a computer, our brains use electricity to think, but also like a computer they need a power supply to work, said Professor Attwell. "When the power is cut off, as happens in stroke or heart attack, the brain will be damaged.”

The lecture is named in the memory of Kenneth B Myer, one of the founding benefactors of the Howard Florey Institute. Since 1992, the Florey has invited internationally distinguished neuroscientists to speak to the Melbourne community as part of this public lecture series. The Kenneth Myer Lecture is a free event, and if you are interested in brain research we invite you to join us. Please register your details online at www.florey.edu.au and we will post your invitation. Alternatively, call Jade Sarna on (03) 8344 1888 to book.

6pm, Tuesday October 4 at Plenary Hall, Melbourne Convention and Exhibition Centre.

OFFERING HOPE TO A FAMILY IN CRISIS

When 12-year-old Michael McKean came home from his first day of high school, he had a peanut butter sandwich and then began spinning in a perfect circle, around and around and around.

At first his mum, Sian Pickersgill, thought he was being silly but it soon became clear Michael couldn’t hear and was locked in a violent fit. When he stopped, he had no awareness of the time passed. Half an hour later he began to spin in a circle again – and then it happened for a third time.

A local doctor diagnosed a neurological problem and predicted a tumour or, in the best case, epilepsy. Sian was devastated. "I had four children and was two weeks from having another baby," she says.

For the next five years, Michael suffered up to six or seven exhausting extratemporal epileptic seizures a day. He had no warning when a seizure was approaching. Blood vessels in Michael’s face and chest often burst, leaving deep purple marks.

Years of differing diagnoses and adjustments to myriad medications ensued, with Sian describing their life as “a living hell”. “Our lives simply existed from one seizure to the next.”

Fortunately, when he reached the age of 17, Michael was referred to the Florey neurologist Professor Graeme Jackson. Graeme offered the family a new, research-based approach to Michael’s epilepsy using the experimental MRI technology developed by Florey Neuroscience Institute at its new home within the Melbourne Brain Centre.

Sian was in a desperate state. “Before we met Graeme, it seemed nothing could be done. He started describing a new approach and I burst into tears. I told him how I’d just had enough of all this. The idea of surgery had seemed out of the question to me but Graeme explained it very well. In the end, I gratefully accepted the opportunity to try and isolate Michael’s problem.”

Using EEG to record electrical discharges in the brain and functional imaging scans to monitor function in real time, Graeme discovered a section that appeared to be “pinched” on the left of Michael’s brain. Cells in this area are highly sensitive to how people orient themselves in their environment. “I thought that’s why he’s spinning around; he’s trying to orient himself,” Graeme says.

Graeme’s novel approach to brain imaging was the key to locating the cause of Michael’s epilepsy. Late last year, Michael had exploratory surgery – involving 30 people from the Florey and Austin Health – to confirm Graeme’s suspicion that there was a malformation of Michael’s cortical development. And, indeed, Graeme’s research provided the answer.

Earlier this year, Michael was struggling to remember his schoolwork, a byproduct of the seizures and a serious obstacle in his first year of the Victorian Certificate of Education.

Just before Easter, a team operated again to remove part of his brain about three centimetres in diameter. Six weeks after the surgery, Michael has had just one seizure and is bursting with energy. “I just want to do everything at once,” he says.

While Graeme is cautious, there is real hope that the seizures will stop occurring. “We can’t say Michael will be free of seizures forever, but this is a wonderful success story because we have been able to identify exactly where his seizures were coming from and to offer him a possible cure. I think Michael is the first of many, which is why it’s so exciting.”

Saba Ansari (left) and Mary Macmillan (far right) celebrate Michael’s newfound energy with his mum, Sian. Michael no longer suffers multiple seizures each day, thanks to experimental imaging techniques that allowed surgeons to remove a part of his brain.

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**ARE YOU UP TO THE CHALLENGE?**

The 2011 Brain Fitness Challenge is gearing up. We suggest you brush up your cognitive skills, grab some friends and gather your team because the website is now open for registrations — www.brainfitnesschallenge.org

Keen to help fund our research and to win a flashy ‘brainy’ trophy? The key to success and a well-exercised brain is right here. Ask your employer, colleagues, family and friends to sponsor you, raise the most money, and the ultimate challenge could be yours.

The competition is an annual highlight for many workplaces around Australia. Here’s what you need to do:

- **Pencil in the dates.** It runs for seven working days during 10 to 18 August 2011
- **Gather five members for your team,** including a team leader
- **Ask friends and family to sponsor you**
- **Register ($97 each or $485 per team), pay and donate online through Amex, Visa or MasterCard**
- **And remember, all donations are tax deductible.**

The challenge involves:

- **Seven levels of competition,** each consisting of five cognitive brain challenges
- **Multiple choice answers**
- **Opportunities to win bonus points by individuals and teams**
- **Tackling increasingly difficult levels as you progress through the competition**
- **It’s a fun way to compare your team’s personal strengths and abilities - but don’t worry – it doesn’t test IQ!**

What’s new in 2011?

- **All new cognitive challenges**
- **Simple registration**
- **Transparent scoring**
- **You will receive answers to challenges at the end of the comp on day seven**
- **Easy-to-use online fundraising**
- **Easy-to-navigate website**
- **Team leader’s kit.**

Register now and join us on August 10. Here’s a taste test...

### This Challenge will test your mental rotation / spatial reasoning:

Continue the pattern of matchsticks...

<table>
<thead>
<tr>
<th>A</th>
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### A verbal skills challenge:

**A family is at the zoo.**

1. ________ watching the elephants.
2. Of all the animals ________ favourite is the rhinoceros.
3. Little Sam is happy because ________ are lots of tigers.

Which of the options below shows the list of words that can be correctly inserted into the sentences above?

| A: 1. their 2. there 3. there’re |
| B: 1. they’re 2. there 3. there |
| C: 1. they’re 2. there 3. their |
| D: 1. there 2. their 3. there |

### This challenge will test your logic:

What number comes next?

2...6...4...10...6...?

Next logical number?

| A: 10 | B: 14 | C: 20 | D: 4 |

Meet the Brain Fitness Challenge **“Top Cog”** for 2010

Belinda Maclay from UBS Wealth Management won the “Top Cog” title for scoring the most individual points in the 2010 Brain Fitness Challenge. Belinda and her “Mark to Market” mates also took out the team trophy. In fact, UBS scooped the pool during 2010, also winning the top individual and top team fundraising trophies! www.brainfitnesschallenge.org

Dr Bianca Jupp is bound for Cambridge

“A bright young star from the Florey is about to head to Cambridge University in the UK to undertake a post-doctoral position with “the godfathers of addiction”.

Despite describing Professors Trevor Robbins and Barry Everitt in these ominous terms, Dr Bianca Jupp is very keen to arrive at the Cambridge Department of Experimental Psychology to further her work in brain behaviour and our inclination to be impulsive. These studies will be under the mentorship of Dr Jeff Dalley, a Kiwi in Cambridge.

Bianca, 32, will be away for about three years but, as the recipient of a prestigious CJ Martin Fellowship, she is bound to come home at the end of her post-doc. “That’s fine with me as I want my career to be in Australia,” Bianca says.

Bianca’s career at the Florey began studying neuropeptides involved in appetite and stress and their impact on drug addiction - and why relapse occurred. “It’s only quite recently that addiction has been understood to be a disease and that things happen in the brain that can result in addiction.”

Her studies investigated where in the brain these neuropeptides were working to influence relapse, a defining feature of addiction. She found a number of regions in the brain were implicated, particularly the pre-frontal cortex.

But why do only some people become addicted? Bianca’s work at Cambridge hopes to address this using neural imaging to study how the brain changes over time with drug use and to assess the changes that are responsible for addiction. She is particularly interested in the strong link between impulsivity and addiction and hopes to investigate the parts within the brain that are responsible for the two.

“It has been shown that people with a particular gene mutation are more likely to be impulsive and impulsive in turn has been linked to conditions such as attention deficit disorder, a tendency to suicide, obsessive compulsive and eating disorders as well as addiction. Understanding what is responsible for impulsivity and how drug use may alter this may in fact help us find a treatment for these conditions.”

At Cambridge, Bianca will be using PET and MRI imaging to investigate the regions within the brain that are responsible for the link between impulsivity and addiction.

**TAKE FLIGHT**

“A in a way, I’ll be bringing my career full-circle,” she says, “combining imaging to investigate how brain changes relate to spontaneity, drug use and risk of relapse.”

Her Florey mentor, Professor Andrew Lawrence is highly supportive of this venture by Bianca. “In the three years that Bianca has been in our lab she has made some important findings. She has also been a great contributor to our team in general and we will miss her,” says Prof Lawrence. “Nevertheless, she has a great opportunity to learn new skills and techniques to help establish herself as a career neuroscientist. I am sure Bianca will learn a lot in Cambridge, have fun and also do some great science!”

“Down the track she will come back and add even more depth and talent to our division. In the current research funding climate, it’s critical for promising young scientists to carve out their research identity – schemes such as the CJ Martin Fellowships are an outstanding way to achieve this.”

We look forward to this talented behavioural neurobiologist’s return so she can continue to search for ways to prevent the crippling effects of addiction.

Best of luck, Bianca.

Would you like to support our young scientists? Please call Jenni Elliott on (03) 8344 1657.
COLLABORATION THE KEY TO ADDICTION STUDIES

Chronic alcohol and drug use can lead to a cycle of addiction which has serious implications for our society, and the families and friends of the drug affected person. The Florey’s Addiction group investigates how alcohol and drugs can change the brain’s structure, chemistry and function. Studying drug-seeking and relapse involve the examination of neural pathways implicated in drug seeking behaviour – critically important due to the likelihood of chronic relapse. Since 2009, Prof Andrew Lawrence and A/Prof Andrew Gundlach in Melbourne and Professor Yadin Dudai, A/Prof Alan Chen and Dr Abraham Zangen at the Weizmann Institute in Israel have been conducting collaborative research on the role of specific neuropeptides involved in drug addiction and relapse. A major impediment to academic medical research is logistical capacity and travel as well as funding for the direct costs of experiments. These areas are most critical, yet the hardest to fund from the majority of granting bodies. Fortunately, this very valuable international collaboration has been made possible by the generous and targeted support of the Besen Family Foundation and The Pratt Foundation.

Both Institutes have developed unique approaches. Prof Lawrence’s lab is one of very few in the world to refine the technique of studying irreversible self-administration of drugs of abuse in mice. This has great potential, combined with genetic manipulation, to understand drug use and abuse. At the same time, genetic manipulation and viral delivery of modifying constructs have been developed and refined by A/Prof Chen’s lab. A perfect synergy has formed between both labs.

Scientists from both Institutes have also met regularly to share ideas, concepts and techniques, including examining the genes implicated in relation to cocaine-seeking. A transfer of key viral reagents developed by A/Prof Chen at the Weizmann to the Florey, has allowed modification by A/Prof Ross Beggath’s lab for use in studies of the relay of 3 peptide system. These studies are ongoing, and some intellectual property has been protected with a provisional patent.

Publications to date include:

For more details, look at our website: http://www.florey.edu.au/research/addiction-neuroscience

OUR NEW HOME TAKES SHAPE

While our epilepsy and stroke teams are hard at work in the new Austin campus of the Florey, our Parkville-based staff are preparing to make the move to their new home on the grounds of the University of Melbourne. The second Melbourne Brain Centre campus will accommodate 500 people working in neuroscience. The Florey is the largest tenant, followed by the university’s neuroscientists and finally, the Mental Health Research Institute’s team. Our staff will begin their move in August. We look forward to opening the laboratories, 250-seat theatre and other facilities for public viewing in October.

The new buildings will provide Florey researchers with unprecedented access to colleagues from other institutions, enhancing the speed of scientific endeavour and building opportunities for novel approaches and shared visions.

We also expect the superb facilities, costing $225 million, to be a magnet for major scientific talent from overseas.

Conditions such as MS, Parkinson’s, Alzheimer’s, neurotrauma, mental illness, motor neurone, Huntington’s disease and addiction will be tackled in unparalleled laboratories.

FLOREY’S HEIDELBERG HOME

The modern foyer at the Florey’s new base, the Melbourne Brain Centre.

THE SMILE OF AN ANGEL

Jack Patterson was born in May 1990, and at only six weeks of age was diagnosed with Infantile Spasm, a rare and very severe type of childhood epilepsy which left him profoundly disabled. As a single parent, his birth mother Irene Lynch made the heart-breaking decision to relinquish Jack for adoption, knowing that she would not be able to give him the special care he would need for the rest of his life.

The baby with the smile of an angel then became the centre of adoptive parents Leonie and Ron Patterson’s world, but Irene and her mum were welcomed into their large, lively and noisy family’s life. They shared all those special occasions families celebrate together.

Jack never developed beyond the stage of a six-month old baby. He would never walk, talk, feed himself or play with toys. But he could sit up, and loved to rip-out the pages of magazines, leaving a mess of torn paper all over his bedroom floor. Leonie and Ron were always planning for Jack’s needs and for the time when there would be no family around to care for him. Never did they think that they would outlive him.

Jack died of pneumonia on February 23 at just 20 years of age. Leonie’s daughters and family friends had made paper flowers to decorate his coffin in memory of his fascination with paper. At his funeral, guests were asked to make donations to Florey Neuroscience Institutes instead of flowers, and this led Irene to making her ‘future gift’ of a bequest to the Florey in memory of a very special child.

If you would like some information on how you could help find a cure for the suffering of people like young Jack, please phone our bequest officer, John Macdonald, for a confidential chat on (03) 90358624 or email him at john.macdonald@florey.edu.au.

“What we do for ourselves dies with us. What we do for others lives on.”

FLORAL CALENDARS FOR SALE

A valued and generous supporter of the Florey, Mrs Takako Machida Subocz, is also a talented floral artist. Her calendars and exhibitions of flora have helped raise funds for our scientists for many years. Takako’s latest floral calendar for 2012 is now available for sale for $10.00, plus postage. Proceeds will be donated equally to the Florey and to the Red Cross to support efforts to alleviate suffering following the recent earthquake and tsunami disaster in Japan.

If you would like to purchase one of these beautiful desktop calendars, please contact her directly on (03) 9858 2119 or takakom11@hotmail.com.

PEDALLING FOR PARKINSON’S RESEARCH

Kieran Donlon is a man with a big vision. In September, he will cycle from tropical Cairns to his hometown of Warrnambool in South Western Victoria to raise funds for the Florey’s research into Parkinson’s disease. “My dream is for every person in Australia to donate one gold coin to make it over $20 million,” he says. “That would go a really long way to finding a cure.”

Kieran knows from first hand experience how a diagnosis of Parkinson’s can affect a life. His wife Julie has suffered from the debilitating condition for more than 15 years, and although she is still an active and capable woman she is finding it increasingly difficult to function in her daily activities. “I used to play a lot of sport, but those days are over now,” she says pragmatically. “Parkinson’s affects my mobility, balance and coordination so that just going for a walk is a real challenge.”

Professor Mal Horne’s Parkinson’s research team at the Florey is using a multi-faceted approach in its quest to find out more about this condition in order to devise better treatments with fewer side-effects and, of course, to crack the code to a cure. Gifts to help Kieran achieve his visionary goal can be made through any branch of the Bendigo Bank, or can be made direct to the Florey.

Would you like to help Kieran realise his dream? Please call Margit Simondson on (03) 8344 1833.
THANK YOU TO THOSE WHO HAVE GENTEROUSLY GIVEN TO THE FLOREY NEUROSCIENCE INSTITUTES BETWEEN MARCH AND MAY 2011. LISTED ARE THOSE WHO KINDLY GAVE $250 OR MORE.

The Angior Family Foundation • David Balcombe • Ballarat Parkinson’s Support Group • Faye Clarke • Barbara Coltman • The Rebecca L Cooper Medical Research Foundation Ltd • Mavis Coster • Gordon Darling AC & Marilyn Darling • Constance Day • Evelyn Fawcett • Arnold Hancock OBE • Nola Jennings • Anne Kantor • Pamela Killer • Bruce & Norma Lithgow • Brian Little • M M Livermore • Kevin Luscombe AM • Judith Moore • Hazel Moyes • Margaret Neely • Sue O’Neill & Enid Telford • Judith Overbeek • Angelos & Janet Pavlakis • The Pratt Foundation • Eda Ritchie • Donald Sanders AO • Robert Sinclair • Estate of Gabriella Szokolyai • Gregory & Wendy Taggart • Jean Thomas • UBS Foundation • The G W Vowell Foundation Ltd • Brian Watson • Lesley Williams • The Yulgilbar Foundation

IN MEMORIAM. We greatly appreciate all the gifts we have received in memory of loved ones. Those remembered here are: Jack Patterson and Jodie Ridge.

KEY DATES

June 24, noon–3pm
Community opening ceremony for the Melbourne Brain Centre’s Heidelberg campus.

September 11–14
The 2011 World Congress on Huntington’s Disease will be at the Melbourne Convention and Exhibition Centre, featuring family and community involvement. Those wishing to register for the IHA Family Day, please contact Glen Johnson at Huntington’s Victoria - ph: 03 9818 6333 or by email on g.johnson@huntingtonsvic.org.au

October 4, 6pm – 15th
Kenneth Myer Lecture – Brain Power at Melbourne Convention and Exhibition Centre

October 5–6
Melbourne Brain Symposium

October 17
Details yet to be announced – Opening ceremony, Melbourne Brain Centre’s Parkville campus.

For more information contact the Editor, Amanda Place: amanda.place@florey.edu.au +614 11 204 526
www.florey.edu.au

Florey Neuroscience Institutes is the amalgamation of the Howard Florey Institute, the Brain Research Institute and the National Stroke Research Institute.
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