

Transmissions

Brain Health Research Centre

NEWSLETTER SEPTEMBER 2014



IN THIS ISSUE

Community supported research

Roadblocks to stroke recovery - are we too inhibited?

Matariki Network, new world-wide collaboration

Understanding the hippocampus and schizophrenia

Meet our researchers

Message from our Director

News in brief

Giant Brain on the move

UPCOMING EVENTS

Monday 25 August, Queenstown

Roadblocks to Stroke Recovery

(more information on page two)

Friday 26 September, Alexandra

Brain Awareness Forum

Community House, Alexandra

10.30-2.30pm

Two of our neuroscientists are speaking at this community forum on brain health

10.30am

Dr Louise Parr Brownlie - pain management

1.30pm

Dr Margaret Ryan - anxiety and memory

For more information Ph Jane 03 479 4066

Community supported research

We are delighted to report that through the support of the individuals and groups in our community, the BHRC has recently awarded several grants to support ground breaking research into a range of conditions.

Dr Nick Cutfield, Clinical Deputy Director of the BHRC, shares his time between his role as clinical neurologist at Southern District Health Board and research at the University. Dr Cutfield's team, including Dr Joanna Williams and Dr Liana Machado, has received funds for their work to develop a more advanced blood test for Parkinson's disease. (PD) is a progressive neurodegenerative disorder. The characteristic symptoms are tremor, especially at rest, a shuffling gait and stooped posture.

PD is currently estimated to affect up to one in fifty New Zealanders over the age of 60. This figure is predicted to double by 2030. Current treatments, only deal with the symptoms and not the underlying neurodegeneration.

It is hoped that through this new study, which will be the biggest of this type ever to be undertaken, earlier diagnosis will be possible and with that, the ability to look more carefully at the different ways and speed which the condition progresses. This would enable more targeted treatment in the future.

Other recipients were Assoc Prof Ruth Empson and Dr Stephanie Hughes who feature in our News in Brief.



Nick Cutfield discusses his new research with Paula Ryan, community educator Parkinson's Otago.

Roadblocks to stroke recovery - Are we too inhibited?

What happens in the brain after stroke, and how to improve recovery?

Queenstown Seminar
25 August 2014, 5.30pm
Mezzanine Function Room
Queenstown Events Centre

STROKE - Currently the major cause of disability in NZ - Is there hope for recovery?

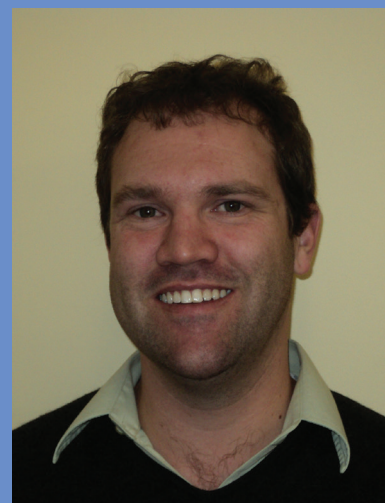
50,000 Kiwis of all ages live with the consequences of stroke. Our centre has discovered that during the first few weeks after stroke, the 'brakes are on', and reducing communication between areas of the brain.

In Queenstown as part of Health Research Week, neuroscientist and stroke expert Dr Andrew Clarkson will be the guest speaker at this event discussing his research findings and what these findings mean for people working to recover from stroke.

Dr Clarkson will be joined by Associate Professor Cathy Stinear, from Auckland University. Together they will share their findings and the resultant questions – around post Stroke management.

- Can we take the brakes off?
- Does this improve recovery?
- Which people are most likely to benefit from this approach?

For more information on our Queenstown seminar, please phone Jane Reynolds at the Brain Health Research Centre, 03 479 4066.



FACTS

Your brain is only 2% of your body weight, but it gets 20% of the blood pumped from your heart and uses 20% of the oxygen carried in your bloodstream.

Information travels as fast as 120 metres per second in the brain. That is equivalent to 432 kilometres per hour.

Physical exercise promotes growth and survival of nerve cells in the brain and is associated with less shrinkage of the brain as we age.

If you have an iphone or smart phone you can sign up for APPs to help your brain health.

Two APPs you may be interested in are available free by googling "stroke riskometer" or "brainy app" on your computer or visiting google play or the App store on your phone.

Matariki Network, world-wide collaboration

When the seven stars of Matariki started appearing in our skies again, planning for a Matariki Network conference in December also started.

What do seven stars have to do with neuroscience? In 2010, the Matariki Network of seven "sister" universities was set up to collaborate tackling global issues, one of which is unlocking the secrets of the human brain. The seven universities are high-quality research intensive institutions, and share a similar town-gown relationship with students encouraged to live on campus, as we share here in Dunedin.

The universities involved in this collaboration are Dartmouth College (USA), Durham University (UK), University of Tuebingen (Germany), Queen's University (Canada), the University of Western Australia (Australia), Uppsala University (Sweden) and the University of Otago. They all bring their own areas of expertise to Brain research and together we believe we will be an even stronger team, who are all committed to finding answers and new treatments for neurological conditions.

In December this year neuroscientists from the seven universities will be meeting together in person at a conference, which we are hosting in Dunedin. Attendees will be discussing integrative neuroscience. This will add to the strength of our own centre by bringing new ideas and innovations and providing opportunities for collaboration and shared research. These types of partnership are increasingly important to ensure the best use of funds and resources and the best outcomes for those looking for hope.

We will bring you more on the Matariki network in our next newsletter.

matarikinetnetwork.com/index.html

Understanding the hippocampus and schizophrenia

A long-standing fascination with the hippocampus of the brain led Professor David Bilkey to focus on research in this area, with a particular interest in the part it plays in the symptoms of schizophrenia. Currently work is being undertaken to gain a greater understanding of the way the hippocampus interacts with other parts of the brain and how it stores memory. Several parts of the brain are involved in memory storage, keeping the “where, what and when” of our memories safe for us to recall. The hippocampus is specifically involved in the storage of spatial memory, or our “where.”

Schizophrenia causes disruption to the sending of clear messages between the cells of the hippocampus and the prefrontal cortex. This in turn creates some of the visible symptoms of the disease such as cognitive loss, memory, attention, decision making and goal setting. Current drug treatments on the market, do not address these symptoms well at present.

Professor Bilkey believes the ultimate outcome of increasing the understanding of the hippocampus will be to see new medications developed which are better targeted at the disruptions to the cells which interrupt the thought processes. “The drugs we currently have available are not ideal; we are in dire need of new medications to better treat this condition. The more we understand, the more likely we are to get better therapies. All of our thought processes are based on our nerves being able to communicate effectively with each other, any distortion potentially leads to alterations in these thought processes which then leads to the behavioural changes that we see with Schizophrenia.”



Professor David Bilkey.

MEET OUR RESEARCHERS

ANTONIO BERRETTA

An interest in chemistry and biology in high school began Antonio's career path into neuroscience, but he did not realise that, at the time. “I did not know exactly what research was and becoming a researcher was not a real ambition, I just had a genuine interest in science.” After completing a Masters degree in medicinal chemistry, Antonio realised that the way new knowledge is gained, is even more intriguing than knowledge per se. His internship period and the PhD provided the opportunity to learn to appreciate the scientific method: “observing, asking questions and trying to get answers is something that deeply fascinates me.”

Antonio's main field of interest is the study of cellular and molecular

mechanisms of traumatic brain damage and repair. The nervous system is very complex and many different cell types are involved in brain function and dysfunction. His research is focused on the role of astrocytes, the brain's main support cells, and the role that these cells play in stroke and traumatic brain injury.

When asked what he hopes to see happen through research in his lifetime, Antonio said: “As research permits us to understand the brain further, it will aid in discovering new therapies. I am confident that pharmacological research will improve life for patients with neurodegenerative disorders or neurological conditions such as stroke and trauma.”



Message from our Director

Professor Cliff Abraham

Mind and Brain, Integrative Neuroscience

Understanding the brain is one of the great frontiers of science. When I initially studied psychology it was my plan to become a counselling psychologist. However, the biology of the brain and the mysteries uncovered through research fascinated me and I found myself drawn to a career in research. Even after almost 40 years I continue to be fascinated by the new findings we uncover.

As a major theme of research within our centre, we aim to generate new understanding of how the neural circuits of the brain work to control mental functions such as attention, sensory perception, motor control and memory.

Research into the cellular and molecular mechanisms of these functions will provide detailed information on how these biological

processes contribute to our various psychological abilities. Knowledge of how these mechanisms are affected by and contribute to disease processes is critical for developing tests for identifying neurological diseases in their early stages, and new therapies to treat them.

The Integrative Neuroscience theme will have its inaugural conference at the University of Otago, New Zealand, on 1-3 December 2014. There we will explore the range of neuroscience research capabilities at the partner institutions and, hopefully, sow the seeds for productive collaborations on a number of research fronts dealing with the mind and brain.

NEWS IN BRIEF

Taking stroke research to the community

Our public seminar in Dunedin, in June was well attended. Over 90 people enjoyed listening to our two speakers Associate Professor John Reynolds and Auckland based Valery Feigin. Feedback from those who attended indicated they appreciated the opportunity to hear news on the latest research on stroke recovery, brain injury and the work of our centre.

Of particular interest was Professor Feigin's finding around the positive effect that reduced sodium intake in our diet can bring in reducing stroke risk. It has long been believed that we had to remove all salt from our diet to achieve much impact, but now it has been proven that even a 15% reduction of sodium in our diet can reduce our risk of stroke by over 20%.

Community funding assists research

A recent grant for Assoc Prof Ruth Empson, Dr Andrew Clarkson and their team will help them continue work looking at harnessing neuroplasticity to effectively guide brain repair and drive rehabilitation after brain damage. "We know that the brain contains millions of nerve cells making trillions of connections that together create densely packed networks. Brain networks are not hard-wired from birth but have considerable capacity to change." This ability to remodel connections, called "neuroplasticity", occurs in healthy brains in response to a variety of everyday experiences, as we grow, learn and age, but also in response to trauma such as a stroke. The ability to transform the activity of networks of connected neurons into useful changes in behaviour, for example learning to walk again after stroke, would result in improved treatments in the future.

BHRC Grant recipient

Dr Stephanie Hughes and Dr Beulah Leitch have a particular research interest in Batten Disease, an inherited fatal disorder of the nervous system. Symptoms, which appear in children who at first seem healthy, include blindness, epilepsy, motor dysfunction and cognitive decline. Dr Hughes and team will use high-resolution microscopy to study the synaptic connections of brain cells. Synapsis is the structure which enables neurons to send electrical signals between cells. They will also work collaboratively with a team in Auckland to try and understand more about the activity in the brain in the early stages of this disease. The grant will enable this important work to continue.

Supported by:



Giant Brain on the move

An exceedingly generous benefactor with an interest in brain health gifted the BHRC our giant brain in late 2013. Since then, we have been having a busy time getting this 90kg exhibit out and about in our community. We believe it is important to give the public the opportunity to know more about both what we do at the Brain Health Research Centre but also what our brain looks like.

The giant brain was on display at the Dunedin Public Art Gallery at Queen's Birthday weekend, with some of our students taking part each day to answer questions and guide people through the brain. More recently we have been involved in the International Science Festival in Dunedin and visited several primary schools.

It would be difficult for anyone not to be both impressed and interested when they walk through the door at an event and find a brain which stands more than 5 metres high. The sheer size of the exhibit creates considerable interest.

A number of our Scientists including Professor David Bilkey, Associate Professor John Reynolds, and Dr Joanna Williams have all taken part in our sessions in schools. These activities give children an opportunity to hear from the experts. We are also hoping that a learning tool as visual as this, will help nurture an interest in science, amongst children in Otago who may have their interest tweaked and decide to become scientists themselves.



Children from Maori Hill School in Dunedin keen to answer questions being asked by Professor David Bilkey during one of our inside the brain sessions.

CONTACT INFORMATION

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Brain Health
Research Centre
Te Pokapū Rakahau Hauora Hinekarō

