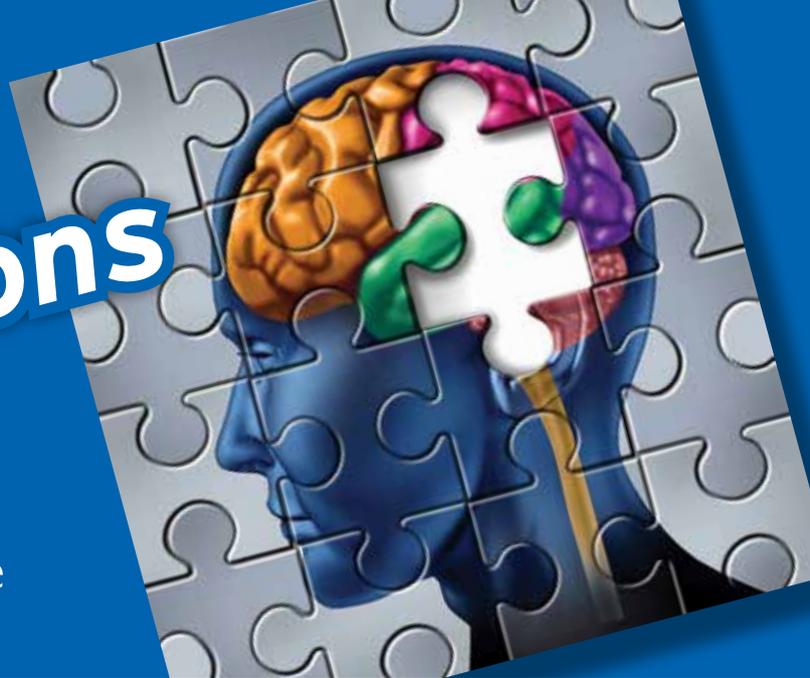


# Transmissions

Brain Health Research Centre

NEWSLETTER MARCH 2014



## IN THIS ISSUE

- Inflatable brain exhibit
- Stroke year 2014
- Stroke therapies then and now
- Scholarship awardees
- Message from the Director
- Upcoming events
- Brain Week programme announced

## NEWS IN BRIEF

### OSMS Awards

Last month the Otago School of Medical Sciences held its annual awards ceremony that celebrates the achievements of staff and students. Congratulations to our BHRC members for the following awards:

- OSMS Distinguished Academic Teacher:  
Dr Christine Jasoni
- Excellence in Postgraduate Supervision:  
Professor Ian McLennan

### NFNZ Grant Success

Congratulations to Postdoctoral fellow Dr Antonio Berretta who recently received a project grant from the Neurological Foundation of New Zealand for his stroke study 'Astrocytic influence on neuronal GABAA receptor subunits during neuronal development and after injury'.

## Introducing our new inflatable brain!

Who would have thought that the latest addition to the BHRC would be a giant, inflatable, walk-through brain? Our 5½ metre high inflatable brain provides a highly interactive educational experience that increases people's understanding of brain health and disease. The inflatable brain shows visitors the various structures and function of the normal brain, as well as examples of brain trauma and disease.

We are so pleased to have this exciting new educational tool, thanks to the support of an

anonymous donor, to take out to schools and public events. The inflatable brain will always have a BHRC member present to guide visitors around some of the key features, and to answer any questions. If you are interested in having the inflatable brain at your next event, please contact us through the details provided on the last page.

Come and explore the brain exhibit for yourself from 15-16 March during Brain Awareness Week at the Otago Museum. See the back page for further details.



## Stroke year 2014

Following on from the popularity of our Alzheimer's public events in 2013, this year our theme will be stroke. Although stroke is largely preventable, it is the third largest killer and the major cause of serious adult disability in New Zealand. When a stroke occurs, the blood supply to a part of the brain stops. This can be due to a lack of blood flow, a blockage, or a haemorrhage. After a few minutes without oxygen and food from the blood, the affected area of the brain cannot function. Stroke is undoubtedly one of the major health issues facing society today and it happens to be one of the key research areas at the Centre. Several of our laboratories are dedicated to stroke research and our scientists have made some significant discoveries such as a compound to reawaken surviving nerve cells in the brain that control movement, as well as new and enhanced rehabilitation techniques.

# 2014 BHRC scholarships

## Roche Hanns Möhler Doctoral Scholarship

\$10,000

Awarded to Shane Hellyer, Department of Pharmacology and Toxicology

*Mechanism of action of marine algal pinnatoxins E, F and G*

Shane's research investigates pinnatoxins E, F and G which have been found in shellfish species from Australia and New Zealand waters.

If ingested, these toxins can pose serious harm to human health.

The toxins have been found to produce numerous neurological symptoms, eventually causing death within minutes via respiratory depression. His research aims to understand the specific effects of the toxins and their threat to humans. His project also investigates whether these toxins could lead to compounds to use in diseases such as Alzheimer's and many cancers.

## Helen Rosa Thacker Scholarship in Neurological Research

\$5,000

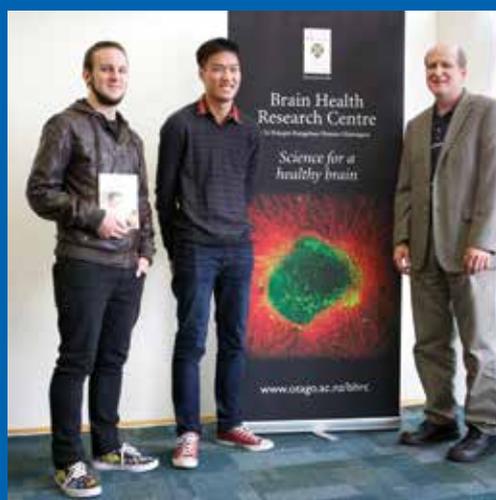
Awarded to Greig Joilin, Department of Anatomy

*The role of microRNA in the long-term potentiation model of memory*

Greig's PhD research investigates how memories are formed, and how changes in memory-related gene expression is regulated. In patients with Alzheimer's disease, a group of molecules called microRNA have been found to be dysregulated. Greig and his supervisor Dr Joanna Williams have discovered that microRNA levels are very rapidly regulated in response to long-term potentiation (a molecular

event that contributes to learning). Greig's research is shedding new light on memory consolidation mechanisms, potentially identifying new therapeutic targets for neurological disease. It is possible that the dysregulation of microRNA in Alzheimer's is inhibiting the persistence of long-term potentiation, and thus affecting memory.

Both scholarship applications will open again in November 2014. For more information about them, and how to apply visit [www.otago.ac.nz/bhrc/scholarships](http://www.otago.ac.nz/bhrc/scholarships)



L-R PhD students Shane Hellyer and Greig Joilin with BHRC Director Prof Cliff Abraham.

## UPCOMING EVENTS

### Mark your diaries

#### Brain Bee Challenge

A competition for high school students on the human brain.

To enter, visit [nzbcc.ac.nz](http://nzbcc.ac.nz)

- Round 1 Online Test 3-23 March

- Round 2 Regional Finals 2 July

#### Monday-Sunday 10-16 March

Brain Awareness Week Dunedin  
(see over for details)

#### Wednesday 4 June 5.30pm

Stroke public lecture with Professor Valery Feigin.  
Dunedin Public Art Gallery.

#### Saturday-Friday 5-11 July

NZ International Science Festival

#### Wednesday 27 August

Queenstown stroke public lecture.

See our next newsletter for further details on these upcoming events.

## Message from the Director

Professor Cliff Abraham

2013 has been an outstanding year for the BHRC, with the launch of a wide range of new initiatives, research projects and community connections. We look forward to building on this success in 2014, beginning with Brain Awareness Week (see schedule on back page). I am particularly pleased with how 2013 has gone, given that I was away on sabbatical leave in Frankfurt, Germany during the second half of the year. It goes to show that the BHRC runs on the efforts of a large and highly capable team of researchers and other staff. My study leave period was very enjoyable, not just for being in Europe during its summer, but for the excellent new research connections that I made with teams over there. In particular, I was able to develop my skills in computer modelling of learning and memory mechanisms in the brain. This work is helping us to understand what happens at the synaptic connections between nerve cells during learning. Our aim is to develop computer models based on real biological data that then make predictions about mechanisms we don't yet understand that we can test in the laboratory, relating to either normal or diseased function. My collaborators and I were able to make good progress on this project, which we will continue this year. We hope to see you during the year at our upcoming events.



Prof Cliff Abraham (right) next to Prof Thomas Deller, Head of the Institute of Clinical Neuroanatomy, Frankfurt.

# Stroke therapies then and now

We asked the experts how stroke treatment has changed in the last 45 years



## Stroke care in the 1970's

By Associate Professor Graeme Hammond-Tooke

When I was in training, we used to treat stroke with a leech applied to each affected limb...just kidding – stroke treatment in the 1970s wasn't that different from today. But there has been progress.

Computerised tomography had already made it easy to distinguish haemorrhagic from ischaemic stroke, but we did not have MRI scanners. Stroke was regarded as a medical emergency, but it was only in the 1990s that 'Time is Brain' became a popular rallying call; although in reality most trials of stroke therapies had shown little benefit. Full anticoagulation with heparin was quite often used, although unproven and now limited to selected situations like arterial dissection. Microvascular extracranial-intracranial bypass surgery was performed with enthusiasm – until 1985, when a large study showed no benefit.

Although the antiplatelet effects of aspirin were known, two large trials in the late 1990s led to the widespread use of aspirin for ischaemic stroke. About the same time, successful trials of thrombolysis with rtPA were also reported and the benefits of stroke units became evident. Widespread implementation of thrombolysis and stroke units is still a challenge. There are now newer antiplatelet agents, like clopidogrel and the new oral anticoagulants offer a more convenient alternative for atrial fibrillation. But what has changed most, is perhaps the current emphasis on scientific evidence, rather than subjecting patients to treatments that may or may not work.

*Associate Professor Hammond-Tooke is a neurologist at the Dunedin School of Medicine. He is particularly interested in psychogenic disorders and transcranial magnetic stimulation (TMS).*



## Stroke care in 2014

By Dr Nick Cutfield

A recent key development in the last decade has been the development of powerful clot-busting 'thrombolytic' medication. If given within 3 hours of stroke onset, an additional 10% of people may regain independence and 30% may benefit to some degree. This treatment can cause bleeding in 6% of patients, so this benefit comes with risk, and patients need to be carefully selected. For some patients this treatment can be given up to 4.5 hours after stroke onset, but the risk-benefit is less clear in this group.

People suffering stroke must phone 111 and be able to get to a hospital offering this service as soon as possible to allow thrombolytic therapy to be considered: it is good to remember that "time is brain". Ambulance services and emergency departments are aware that stroke requires urgent transfer, assessment and CT scanning.

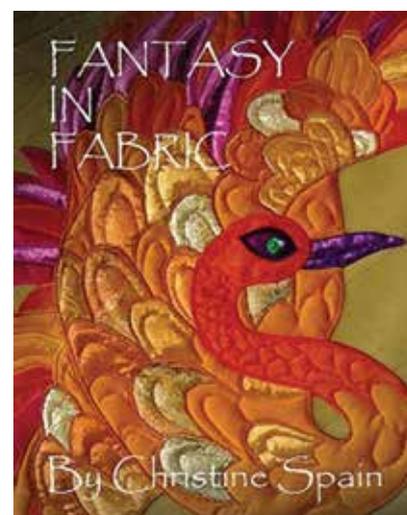
Determining the mechanism of a stroke means every effort is now made to reduce the risk of recurrence by specific interventions. Some mechanisms include: a blood clot having arisen from an atherosclerotic internal carotid artery or from a heart that is not beating in a coordinated way; narrowed arteries in the brain; or a haemorrhagic stroke can occur due to rupture of weakened arteries. Interventions always considered include blood thinning, lipid modifying and antihypertensive drugs, as well as carotid artery surgery.

Rehabilitation with physiotherapists, occupational therapists and speech language therapists is now started as early as is possible. Hospitals aim to coordinate stroke services so that medical, nursing and allied health staff have specific expertise in stroke, and to ensure best care from the ambulance through to completing rehabilitation.

*Dr Cutfield is the Brain Health Research Centre's Deputy Clinical Director, and Clinical Senior Lecturer in the Department of Medicine. He is also a Consultant Neurologist and Clinical Lead at Dunedin Hospital.*

## Art exhibition raises \$10,500 for Parkinson's research

The Brain Health Research Centre extends grateful thanks to Mrs Christine Spain, who recently made a significant contribution to the BHRC from the sale of her exquisitely quilted artwork. On Mrs Spain's wishes, the donation will fund a new Parkinson's disease research project led by BHRC Clinical Deputy Director, Dr Nick Cutfield in collaboration with BHRC principal investigators Dr Joanna Williams and Dr Liana Machado. Dr Cutfield's project aims to identify molecular changes in the blood that are diagnostic of Parkinson's disease. In accepting the gift, Dr Cutfield said, "We hope to develop a simple blood test to help diagnose patients very early on in the course of the disease". Dr Cutfield said that it is possible that some promising treatments for Parkinson's haven't been as successful as hoped because they are given too late, when symptoms have already progressed too far. "A diagnostic blood test would allow us to treat patients earlier with preventative treatments and slow the progression of the disease". Mrs Spain, who has Parkinson's disease herself, spent four years working on 35 beautiful and intricate pieces for her exhibition 'Fantasy in Fabric' on Magnetic Island, Australia. Her donation will make a significant difference to Parkinson's disease research at the Brain Health Research Centre.



## NEWS IN BRIEF

The BHRC would like to thank Professor Ian McLennan for his service as Chair of the BHRC's Behavioural Phenotyping Unit (BPU) Scientific Committee. Dr Andrew Clarkson has taken the position of Chair after serving as Deputy to the Committee.

### Supporting the BHRC in 2014

Our researchers rely on external grants and the generosity of our community for much of their work. With your support, we can significantly enhance our research and ability to discover new treatments for brain diseases.

Donations to the BHRC are administered through The University of Otago Foundation Trust, a registered NZ charity. You can donate online at [www.otago.ac.nz/bhrc](http://www.otago.ac.nz/bhrc), or cheques can be made out to 'The University of Otago Foundation Trust - BHRC'.

There are a number of ways to support the work at our Centre, including considering a gift in your will, or a gift in memory of a loved one. Alexis is available to discuss these options with you on 03 479 4150, or [bhrc@otago.ac.nz](mailto:bhrc@otago.ac.nz)

### Looking for speakers for your organisation?

Our scientists and educators are keen to share their work you and have a range of topics that are fascinating. If you would like a speaker for your community group, please contact us on 03 479 4066 or [bhrc@otago.ac.nz](mailto:bhrc@otago.ac.nz) and we can arrange someone to speak on a topic of interest to your organisation.

### CONTACT INFORMATION

Brain Health Research Centre  
University of Otago  
PO Box 56 | Dunedin 9054 | New Zealand  
Tel: (+64) 3 479 4066  
Email: [bhrc@otago.ac.nz](mailto:bhrc@otago.ac.nz)  
[www.otago.ac.nz/bhrc](http://www.otago.ac.nz/bhrc)

Supported by:



### Conscious about the Subconscious

Monday 10 March 12.15pm

Hutton Theatre. FREE!

Can we trick, calm and heal the mind? A neuroscientist, a former Buddhist monk and a hypnotherapist provide three different perspectives on the power of the mind.

### Growing Pains

Tuesday 11 March 7.00pm

Hutton Theatre. FREE!

Learn how to maximise healthy neurological development, keep your brain healthy from before birth to later life and discover what happens to the brain and our memory as we age and develop.

### Neurological conditions - treatment and care

Wednesday 12 March 12.00pm-2.00pm

Hutton Theatre. FREE!

A support and information session featuring short talks from researchers and care agencies who will share what help there is for families with neurological conditions.

### My brain made me do it

Thursday 13 March 7.00pm

Hutton Theatre. FREE!

Can neuroscience explain anti-social behaviour? Two teams, the community versus neuroscientists, debate the scientific limitations and the ethical and practical implications of saying 'my brain made me do it'.

### Compendium for a Dream

Friday 14 March 5.30pm

Atrium level 1. FREE!

From the Ancient Greeks' prophetic predictions to the subconscious yearnings described by early psychoanalysts, dreams have long been ascribed enormous power. Come to a casual evening with current dream experts to discover the modern scientific description and power of dreams.

### Neurological Foundation Brain Day

Saturday 15 March 10.00am

Hutton Theatre. FREE!

10.00am: Dr Helena Popovic (Medical Doctor, Australia) *Changing our minds and boosting our brains – insights into dementia.*

11.30am – 1.00pm: Panel discussion *The neuroscience of tinnitus.* Neurological Foundation Chair of Neurosurgery Professor Dirk De Ridder, Professor Deb Hall (University of Nottingham) and Dr Grant Searchfield (University of Auckland) Chaired by award-winning filmmaker Allan Baddock.

1.30pm: Arnar Astradsson (Neurosurgeon from Denmark) *Stem cell transplants for Parkinson's disease.*

### Brain Awareness Family Day

Sunday 16 March 11.00am-3.00pm

Atrium level 1. FREE!

Get your genius on! Measure your perception! Walk through the mega-inflatable brain! Join us for a cerebral carnival – a family fun day filled with brain-related games and activities, talks and information from our local experts from the University of Otago Brain Health Research Centre.