



Transmissions

Brain Health Research Centre

NEWSLETTER JUNE 2014



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NEWS IN BRIEF

Researchers to speak in Central Otago

Following on from our successful public seminar in Queenstown in 2013, two more events are planned for 2014.

QUEENSTOWN
25 August 5.30pm
Queenstown Event Centre

Stroke research - BHRC researchers and Professor Michael Nilsson, Clinical Researcher, Hunter Medical Research Institute Australia

ALEXANDRA
26 September 10-2pm
venue to be confirmed

Understanding & coping with neurological conditions. Speakers will include researchers and support agencies.

For more information Ph Jane 03 479 4066

Otago to co-lead new national Centre of Research Excellence

Professor Cliff Abraham, Director of our centre, will be Director, along with Professor Richard Faull (University of Auckland), of an exciting new collaborative research initiative which has received substantial government funding.

When interviewed Professor Abraham was clearly buzzing about just what this means for Otago: This new Centre of Research Excellence (CoRE) will bring together the expertise of New Zealand's top scientific and clinical expertise to work on advancements and understanding of the aging brain. The vision of this project is to enable people to age well with a healthy brain."

Vice Chancellor Harlene Hayne commented on the significance of both the additional funding this project brings to Dunedin and impact it

will have on research in the future. "My hope is that following on from the success of the Chair in Neurosurgery project, this new exciting innovation will help Dunedin to become the Brain Capital of NZ."

With an aging population and estimations that by 2036 one in four New Zealanders aged over 65 will be affected by age related brain disorders it is vitally important that greater understanding and therapies can be developed.

This new CoRE will form a national partnership between the Brain Health Research Centre, here in Dunedin and the University of Auckland based Centre for Brain Research. Also involved in this partnership are the AUT University and the NZ Brain Research Institute in Christchurch.



Vice-Chancellor Harlene Hayne, Professor Cliff Abraham and Professor Richard Blaikie, Deputy Vice Chancellor Research.

Public Seminar

“Stroke - the burden of acquired brain injury”

Wednesday 4 June 5.15pm

Dunedin Public Art Gallery | The Octagon, Dunedin

Guest Speaker Professor Valery Feigin
Neurologist and clinical epidemiologist

Valery's areas of particular expertise are Stroke and Traumatic Brain Injury Prevention.

To secure your place, please register your name at bhrc@otago.ac.nz
or (03) 479 4066 by 3rd June.

Supported By:



Professor Feigin is guest speaker at our Public Seminar on Wednesday 4th June. He is an internationally recognized expert in stroke and traumatic brain injury, epidemiology, prevention and management.

His interest in stroke began after his father died from stroke, 30 years ago. Professor Feigin believes stroke is one of the most fearful disorders and imposes a huge physical, emotional and financial burden on the stroke patients, their families and society.

In the 1980s he started conducting his own research projects. Since then he has published over 390 research articles in leading international and local medical journals and eleven stroke handbooks and twelve book chapters. Professor Feigin currently leads the Stroke Experts Panel of the Global Burden of Disease Project that contributes data to the World Health Organization (WHO). He is also on the Board of Directors of the World Stroke Organization, Chair of the Global Burden of Disease Neurology Section, and a member of the World Health Organisation Advisory Working Group on Stroke.

UPCOMING EVENTS

Stroke Awareness

Auditorium at Dunedin Public Art Gallery

Sat 31 May, Sun 1 June - Wed 4 June
11am-3pm

WELCOME TO THE GIANT BRAIN! You are invited to visit the University of Otago Brain Health Research Centre's walk-in inflatable brain and discover more about your brain.

Wed 4 June 4pm

DVD Aphasia The Movie (40mins) An award-winning film made by actor Carl McIntyre, who had a stroke early in life and suffered loss of speech (aphasia). An insight into Stroke, which can occur at any time, at any age. In association with the Brain Health Research Centre.

NZISF and SciFest 5-13 July, Dunedin

www.scifest.org.nz

Million dollar microscope first in New Zealand

Viewing and analysis of living brain cells is now a reality for University of Otago neuroscientists, thanks to a million-dollar microscope. The microscope was purchased with the assistance of NZ Lottery Health funding, and internal University of Otago sources.

Scientists have previously been unable to investigate the malfunction of living cells in neurological conditions. In the past we have had to rely on viewing cells post-mortem for research. The multiphoton microscope allows researchers to discover how complex networks of brain cells communicate with one another at synapses less than 1/1000 mm in size.



Associate Professor Ruth Empson.

The new multiphoton microscope is the first of its kind in New Zealand and is one of only a handful throughout the world. The microscope applies a powerful, yet harmless infra-red light that allows scientists to see into living organs and cells with unparalleled detail and speed.

Associate Professor Ruth Empson from the Brain Health Research Centre, led the group which co-ordinated efforts to acquire the microscope. This new equipment will enable students and researchers to visualise changes in brain structure during development, across puberty, right through to old age

“The new microscope will revolutionise our understanding of brain cells and will be especially important in the understanding of mental illnesses and brain traumas. We will be able to see how impulses change or malfunction in response to a brain trauma or disease such as Parkinson’s or Alzheimer’s.” Assoc. Prof Empson said.

Nobel winner works with BHRC student

BHRC PhD student Emmet Power was extra chuffed to receive an award for his lab skills recently, while attending the recent three week Australian Course in Advanced Neuroscience (ACAN). The award was presented by the man who won a Nobel Prize for inventing the technique known as Patch Clamping.

Patch clamping is a technique which records the activity of ion channels of single cells. Bert Sakmann and Erwin Neher won a Noble Prize in 1991 for their work, and Prof Sakmann was at ACAN and presented the prize.

Although Emmet has two years' experience in patch clamping, he said it was "special and a terrific learning experience" to be working under the eye of its inventor. "It was pretty cool. Bert was very interested in all the students and wanted to chat about your research and career and gave sage advice."

Emmet's attendance at ACAN was supported by the BHRC, Neurological Foundation, Dunedin Company of Physiologists and the Department of Physiology.



Professor Sakmann overseeing Emmet Power in the lab.

Professor awarded \$150,000 for Parkinson's Research

A drug delivery system designed to mimic the normal neuro-chemical signaling in the brain is another step closer to reality thanks to a Health Research Council (HRC) Explorer Grant.

Associate Professor John Reynolds (Department of Anatomy), and Deputy Director of the BHRC was awarded \$150,000 in the most recent HRC grant round to further develop his system.

The aim is to reinstate the dopamine signal missing in Parkinson's disease (PD) by activating the release of dopamine replacement drugs with natural timing, using biological carriers targeted to key brain areas.

He aims to restore movement in a PD model without the debilitating side-effects associated with current dopamine-replacement therapies. L-DOPA, the mainstay in PD therapy, can induce abnormal movements in many people within three to five years of commencing treatment.

"Our system holds the promise of lifelong PD treatment without these side effects, because dopamine replacement can be customized to mimic the natural dopamine signal in targeted brain areas," Assoc Prof Reynolds says.

He and his team have been working towards this goal for six years.

His previous work had shown extremely promising results in healthy brains, and in cellular models. The Explorer Grant will enable him to test the effectiveness of the system in a Parkinson's model.

"This is a very slow, intensive process but I've always been motivated by the thought that this could revolutionise the way PD is treated, and relieve people from the debilitating side-effects of current medication."

Explorer grants are intended to advance innovative ideas that have potential for major impact.



Message from our Director

Professor Cliff Abraham

Hot off the press is the big news that the Tertiary Education Commission has funded the Centre of Research Excellence (CoRE), "Brain Research New Zealand – Rangahau Roro Aotearoa". As noted elsewhere in this newsletter, this CoRE will be hosted by Otago and Auckland Universities but also include researchers from the University of Canterbury and AUT. The CoRE includes many members of our BHRC, and so we are absolutely delighted with the decision. It is extremely gratifying to have it recognised that our brain research team, that stretches across four universities, is one of the top six research teams in the country, both in terms of quality of science

and benefit to New Zealand. I am humbled to be accepted as one of the co-Directors of the new CoRE, along with Professor Richard Faull at the University of Auckland. The CoRE will be a national entity that we will develop to strengthen and build on the strong local platforms, such as the BHRC, which will continue on its course (never fear). Meanwhile, the BHRC's 2014 "Stroke" Theme is continuing, and I urge you to attend the events which may be coming your way, as announced through our newsletters and website. Or feel free to contact us directly if there is some way we can help you in addition to what we have already planned.

YOUNG INVESTIGATOR'S HARD WORK ACKNOWLEDGED

The 2014 BHRC Young Investigator Dr Andrea Kwakowsky arrived from Hungary five years ago to take up a position in a BHRC lab. Since then, she has published five papers, all in high-quality journals and four of them as first author.



"I've been living in the lab," she laughs. Dr Kwakowsky also acknowledged that since the birth of her daughter three years ago she has redoubled her efforts at work.

"I have always been very focused, but when you have a child you get even more focused. You don't have the luxury of sitting around for hours thinking 'how do I write this sentence?' You have to be efficient," she says.

A Research Fellow in the Department of Physiology, Dr Kwakowsky's research focuses on signalling systems involved in normal brain function, and also conditions associated with aging like Alzheimer's disease.

How you can support the Brain Health Research Centre

With your support, we can enhance our research and understanding of brain diseases. Any donation given to the Brain Health Research centre is used locally, by our researchers based at the University of Otago.

Donations can be posted to BHRC, University of Otago, PO BOX 56, Dunedin 9054. A living legacy is another way that you are able to help future generations. By leaving a gift to our centre in your will, this would ensure that important research work continues beyond your lifetime.

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BHRC PhD candidate Owen Jones' thesis is officially "Exceptional"

An "Exceptional Thesis" is when all three examiners agree that the thesis is of an exceptional standard in every respect – research content, originality, quality of expression and accuracy of presentation – and is amongst the top 10% of those examined.

Owen's work looked at the role of astrocytes, star shaped cells in the brain that had been previously dismissed as playing a relatively unimportant role. However his work showed that astrocytes had the ability to dampen neuronal communication, and it is possible that when things go wrong, as in Alzheimer's disease, they may over-do the dampening so that neurons lose touch with each other.

Owen says studying neuroscience is the most interesting thing he has ever done.

"The work is always challenging. Projects are always developing and changing. We're always learning new things and moving on and that's exciting."

Owen completed his thesis, entitled "Intercellular Communication and Heterosynaptic Metaplasticity in the Rodent Hippocampus", under the supervision of BHRC director Professor Cliff Abraham.



Stroke year

There are 7,000 new strokes in New Zealand every year and in 2014 our Centre intends to focus on the research and possible treatments for this debilitating disorder. Join us during the first week of June when we feature a number of events that highlight this important area of research.

Refer page 2 for more information.