Connections

Summer 09/10
Issue One

Open for business!

CENTRE FOR
BRAIN RESEARCH
THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau

On our cover:

Official opening of the Centre for Brain Research

"It's only the end of the beginning. Today is just the start!" declared Professor Richard Faull at the official opening of the Centre for Brain Research on 6th November 2009. It was a day of celebration, as representatives of neuroscience research groups at The University of Auckland, clinicians from the regional DHBs and community support groups gathered together to launch the exciting joint venture.

The official opening was performed by the Minister of Research, Science and Technology, Dr Wayne Mapp. His speech highlighted the Government's commitment to research in New Zealand, as well as the increasing need for science to drive our economy and healthcare.

More than 250 guests filled the newly revamped $16 million fifth floor laboratories of the Medical School at the Faculty of Medical and Health Sciences Grafton Campus. Eru Thompson and other members of the CBR Māori Advisory Group welcomed visitors to the Centre, with Professor Iain Martin, Professor Stuart McCutcheon, Dr Wayne Mapp and Professor Faull all giving well received speeches.

Left to right:

Professor Alan Barber, Deputy Director of the CBR; Professor Iain Martin, Dean of the Faculty of Medical and Health Sciences; Professor Richard Faull, Director of the CBR; Dr Wayne Mapp, Minister of Research Science and Technology; Roger France, Chancellor; Professor Stuart McCutcheon, Vice-Chancellor of The University of Auckland.

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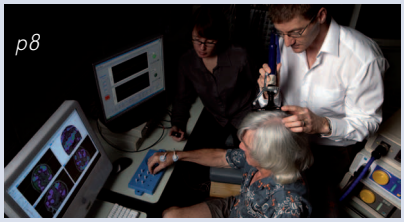

Connections is published by the Centre for Brain Research. This newsletter can also be found in PDF form on the website:

www.cbr.auckland.ac.nz

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Letter from the Director

It's been a momentous year for all at the Centre for Brain Research

The launch of the Centre for Brain Research was a great day for us all. The establishment of the Centre has been a team effort – a team committed to making the dream a reality. We have been guided by the expertise of our Advisory Board, and helped along the way by the enthusiasm, inspiration and hopes of so many people. The Centre for Brain Research is all about people working together to help people. He tangata, he tangata, he tangata.

The CBR brings together three pillars of strength – brain researchers in the University of Auckland, neurologists and neurosurgeons in our hospitals, and family and community organisations. We aim to harness the combined expertise and strengths across these three pillars to ensure that brain research in the University, from basic right through to applied, is of the highest international quality and is informed by interactions with our leading doctors, to help serve the community and families affected by brain disease.

Critical to our development has been the enthusiasm and support of the 40 research groups from across the Faculty of Medical and Health Sciences and the Faculty of Science - they represent the power house of brain research in the University. The involvement of the clinicians in the Auckland Hospitals has been crucial - the commitment of the neurologists and neurosurgeons led by Deputy Director Professor Alan Barber to the Centre has been a vital ingredient for success. In essence, the researchers and clinicians form the heart and soul of the Centre for Brain Research.

Most importantly, the engagement of the community organisations is central to the ethos of the Centre - they are our Community Partners who are committed to our shared vision; helping to inform and make our research relevant to the communities we serve. It was a special privilege to share the launch day with representatives from all our community partners, and with the families and whānau involved with neurodegenerative disorders who have been engaged from day one. Their commitment and generosity over the years led to the establishment of our Neurological Foundation Human Brain Bank, which is a cornerstone of the Centre. They have given the most precious and unique gift to science – the brain of their loved one after death - to facilitate and drive our research efforts. These unique gifts provide the platform for our future research efforts and discoveries. We will be forever indebted to their generosity.

The CBR launch was held at the Faculty of Medical and Health Sciences Grafton Campus in the newly redeveloped fifth floor laboratories.

Fundamental to the establishment of the Centre has been all the external funding organisations who have provided support over so many years for nurturing and developing neuroscience research at the University. We are especially grateful for the philanthropic support from families, trusts and charitable organisations which has been crucial to our development. Their generosity has given us "dream money" to develop new initiatives in research and provide the seeds of success for our future.

Yet we wouldn't be here without the crucial environment and support which The University of Auckland, the Faculty of Medical and Health Sciences, and the Faculty of Science have created over the years. The Centre is now launched and we embark on the exciting and challenging journey of discovery together to fulfil our dreams and aspirations.

Professor Richard Faull

Professor Faull has been voted New Zealand's Scientist of the Year in 'North and South' magazine January 2010 issue.

Communities at the heart of CBR

Community groups from across New Zealand welcomed the launch of the Centre for Brain Research

Fourteen Non-Governmental Organisations (NGOs) form the 'Community Partners' which are critical to the success of the Centre. The NGOs support people living with neurological conditions at both a local and national level.

Taking new treatments into the clinic and community is the central aim of neurologist Professor Alan Barber, the Deputy-Director of the Centre. Professor Barber is the head of Stroke Services at Auckland District Health Board and holds the Neurological Foundation of New Zealand Chair in Clinical Neurology, as well as being the Medical Advisor to the Stroke Foundation (Northern Region).

"Working together means that the questions our researchers ask are the ones clinicians want answers to," says Alan. "And at the other end we hope to be able to take the basic science research that has been done and translate it into new therapies and treatments for patients."

The improved interaction and consultation heralded by the launch of the Centre was well-received by Alzheimers New Zealand. "The CBR takes into account the wider community when studying neurological disorders," says Cass Alexander from the charity. "Often, the scientists behind dementia research and the people providing grass-roots support and care can be worlds apart, but an incentive like this changes that. New information in the lab can be imparted to community groups immediately and there's a chance for scientists to meet with and give talks to the people affected by neurological diseases in their area."

Relationships with community groups have been built up by the scientists in the CBR over many years of research. Professor Faull is himself the patron of the Alzheimer's Foundation (Auckland), Alzheimers New Zealand Charitable Trust and the Huntington's Disease Association (Auckland and Northland), and the Medical Patron of the Motor Neurone Disease Association of New Zealand.

"A positive and two-sided relationship between the neuroscience sector and the community sector is essential to make life better for people with neurological conditions."

Cass Alexander from Alzheimers New Zealand is hopeful about future developments. "This research has the potential to develop new therapies, which will benefit people with neurological disorders and their carers directly and in a tangible way, which is always our main outcome."

"A positive and two-sided relationship between the neuroscience sector and the community sector is essential to make life better for people with neurological conditions," she explains. "It will also be a chance for organisations such as Alzheimers New Zealand to contribute and assist the CBR by sharing our own knowledge of the disease and how it affects people, as well as providing contacts for recruiting participants for new clinical trials and research."

Professor Richard Faull speaking at the Parkinsons Auckland conference

CBR Community Partners

- Alzheimers Auckland Inc
- Alzheimers Counties Manukau Inc
- Alzheimers New Zealand Inc
- Epilepsy New Zealand Inc
- Huntington's Disease Association (Auckland and Northland) Inc
- Motor Neurone Disease Association of New Zealand Inc
- Multiple Sclerosis Society of Auckland and the North Shore Inc
- Multiple Sclerosis Society of New Zealand Inc
- Muscular Dystrophy Association of New Zealand Inc
- Muscular Dystrophy Association Northern Branch
- Parkinsonism Society Auckland Inc
- Parkinsonism Society of New Zealand Inc
- Stroke Foundation of New Zealand Inc
- Stroke Foundation Northern Region Inc

Community Outreach

It's been a busy few months for CBR researchers, with community engagement and education at the heart of many of the research programmes in the Centre. Associate Professor Michelle Glass has helped to expand the minds of students at the University of the Third Age, while Professor Richard Faull, Clinical Associate Professor Barry Snow and Dr David McAuley all spoke at the Parkinsons Auckland conference in November.

We hope to expand our outreach and talks programme in the community. If you would like to be part of this please contact the Outreach Committee of BrainWaves. Please see page 10 for more information.

Photo shoots

Special thanks go to Birkenhead Primary School, the Laura Fergusson Trust and Alzheimers Auckland for providing photo shoot sets for the CBR Profile! Many of the photos you can see on our website and promotional material are thanks to their generosity in time.

Inspiring a hive of research activity

The launch day was an exciting moment for many, but for Auckland artist Agnes Wood it became a chance to inspire the future of brain research. 88 year old Agnes has supported Professor Richard Faull's research programme for over five years, throughout Agnes' daughter Elizabeth's battle and subsequent loss to Alzheimer's disease.

On the day the Centre was officially opened, Agnes announced she would like to donate some art to the research teams. "Richard had come to see my paintings in the Remuera Gallery a few weeks ago, when I saw him looking at another picture, and his face just lit up," says Agnes. "It was one of a head and brain of course, and I knew he had to have it!"

The painting, titled 'Archaic Greek Head', is by Paul Radford, an Elam School of Fine Arts graduate and New Zealand painter. Worth over $5000, the artwork was hung in the CBR in a special ceremony attended by Agnes, son Chris Wood and son-in-law Derek Smith. The family believes the painting is a fitting tribute to Elizabeth, who died in 2007.

From left to right: Professor Richard Faull, Derek Smith, Agnes Wood and her son Chris Wood.

Elizabeth gifted her brain to the Neurological Foundation of New Zealand Human Brain Bank, of which Richard is the Director, to further research into Alzheimer's disease. "This art is highly relevant to the Centre, with all the figures and work going on in the head," says Derek. "It's such a wonderful memorial to my wife."

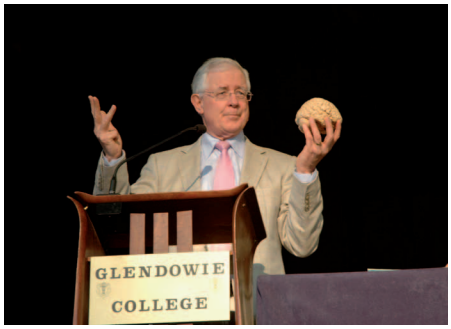
Agnes described the painting as a 'hive of activity', and feels it has a special meaning for the Centre. It was a message that hit home for Richard. "Agnes' family have contributed to our research in very special ways. Now our next step is to make sure the Centre lives up to their dream."

Budding scientists fund brain research

Students at Glendowie College in St Heliers were so impressed when Professor Richard Faull spoke to them about brain research they decided to give him a helping hand. Funds raised from a 'mufti' day came to $1450, and the pupils wanted it go towards helping to fight brain disease.

Professor Faull accepted the donation at a special school assembly presentation. His talk on the human brain created great excitement, and Principal Louise Moore tells us many of her students have since expressed an interest in science careers. Head Girl Kimberly Torrie and Head Boy Ben McGuiness requested the money be used to further research into neurodegenerative diseases.

Professor Faull explains the mysteries of the human brain to students at Glendowie College



CBR in the news

The CBR launch was featured in:

- 'North and South', November Issue
- 'New Zealand Herald', 'Newstalk ZB' and 'Radio NZ' news, Oct 13th
- 'TVNZ Te Karere', November 6th
- 'East and Bays Courier' and 'North Shore Times' Nov 11th
- 'New Zealand Doctor', Nov 17th
- 'University News', Nov 27th
- 'TV3 Pacific Beat Street', Nov 15th

Interviews with Professor Richard Faull highlighting research at the Centre have also been featured on TV and radio.

- 'Triangle TV – The Beatson Interview', Nov 25th
- 'Radio NZ Kim Hill Saturday', Dec 12th

Stem cells have hit the news lately, with controversy over their use as an unregulated treatment in foreign clinics. Associate Professor Bronwen Connor was featured on TVNZ Sunday on Nov 8th and Radio NZ on Nov 30th.

CeleBRation Choir sings for joy

We all know the power of listening or dancing to our favourite songs. At the end of a long day, turning on the radio and belting out a tune can soon see a bad mood disappear. That's the premise behind the new CeleBRation Choir - yet this is no ordinary singing group.

The CBR Choir was set up in September by supporters and members of the Centre for Brain Research, to use music as therapy for people with neurological conditions such as Parkinson's disease or stroke. The weekly sessions at the Tamaki Campus provide an opportunity for patients and their caregivers to get together and enjoy a sing-along. It's the first choir of its type in New Zealand.

The group was inspired by a similar concept at the Royal Hospital for Neurodisability in London. "I saw an article about a choir called 'Sing for Joy' and their hugely popular concerts," says Laura Fogg, the Communications and Liaison Manager for the Centre for Brain Research. "When I then heard about the music and speech therapy research underway in the Department of Psychology it seemed like the perfect opportunity for the CBR!"

Music Therapist Alison Cooper soon joined the team after a recommendation from Parkinson's Auckland. Alison was in the middle of a pilot music therapy group with Parkinson's patients, and the choir seemed the next natural progression. She says there is growing evidence that music is beneficial to people's health. "Music uses many different parts of the brain. To sing a song you have to listen to the sounds, remember the tune and words, then make the sounds yourself and finally fine-tune it as you go to make sure you stay in pitch. So even if one part of the brain is damaged through an accident or disease, it seems the brain can use other pathways to produce a song."

It's an idea backed up by research in the CBR. Post-doctoral fellow Dr Lucy Patston, working with Dr Lynette Tippett, is currently expanding on her discovery that musicians have different brain connections and processing areas than other people. "We found that musicians effectively hear music as a language, processing it in their left hemisphere as well as in their right. We also showed that musicians lack the normal asymmetric brain processing of visual stimuli. Both findings suggest spatial attention and visual processing may be represented more bilaterally in musicians than in non-musicians. We think this means musicians may have experienced early brain plasticity, reshaping their neural networks."

The CeleBRation Choir and musicians in action.

The idea of neural plasticity is one that creates great excitement - heralding the ability to 'rewire' the brain and find new ways of processing information that may have been lost through injury or disease. It's a concept Alison endorses anecdotally. "We've found that when people start to sing songs they've known for a long time, it also triggers their memory and speech," she says.

"Even if one part of the brain is damaged through an accident or disease, it seems the brain can use other pathways to produce a song."

Lady Rhyl Jansen is a regular choir participant with her husband Sir Ross Jansen. Ross has primary progressive aphasia, and experiences difficulty speaking. "I love attending the choir," says Rhyl. "We come all the way from Orewa to get there, but I think it's worth it. It's great fun of course, but we're also finding that Ross speaks more both in sessions and at home."

St Heliers resident Iris Matheson was diagnosed with Parkinson's disease two years ago. She still works part-time supporting the elderly in their homes, but sometimes has difficulty walking. Joining the choir has helped her in more ways than one. "I feel I can walk more confidently than I did before," she says. "The breathing exercises seem to strengthen your core muscles – when you do them repetitively and every day." An avid singer, she says working the vocal chords seems to "oxygenate your blood" and makes you feel better. "It's something a bit different. We all get stuck in a rut and it's good to do something new."

The choir has been helped along by a team of dedicated volunteers from the CBR. Colin Mak, a PhD student in Professor Faull's laboratory, is the resident keyboard player and Dr Cathy Stinear has been critical in publicising the event in the community. Dr Yogini Ratnasabapathy, the head of Stroke Rehabilitation Services at Waitemata District Health Board, has also brought her experience with art and music therapy to the group. Keeping the volume levels up have been a host of lively singers from the Audiology and Speech Therapy teams at the Tamaki campus.

"It's very positive," Alison says. "We're already getting about 10-15 regulars attending plus our volunteers, and they're coming back every week so that suggests they're enjoying it! It's a social thing just as much as the actual music."

The CeleBRation Choir performing at the CBR Christmas party: Alison Cooper is bottom left, Mary Brown is third from the left on the bottom row, Iris Matheson is bottom right, Lady Rhyl Jansen is fourth from the left on the middle row and Laura Fogg is on the far right.

Singer defies stroke disability

Mary Brown takes a photo out of her wallet and grins broadly as she lifts it up. The photo is of a young, pretty blonde girl. Mary points at the photo, then at herself and positively beams with pride. "Is that your daughter?" I ask? Mary nods profusely. I ask if she lives in New Zealand. She shakes her head emphatically. Then she jabs her finger at me. "In Britain?" I ask, coming from the UK myself. She nods her head and grins.

This is the best approximation of a conversation that Mary can have. In 1999 she suffered a massive stroke that left her aphasic and unable to find the words to speak. Now 63, she still struggles with communication but is very independent and active. She organises her time around a packed itinerary of social events including the CeleBRation Choir.

"I can tell Mary is getting immense enjoyment from attending sessions of the CBR choir", says her brother Terry Snow. "Mary's speech has improved over the years from one or two words to whole phrases, but she still has trouble with connected sentences. Yet we have always known that singing has a special effect – at family Christmas carol sessions each year, Mary has always been able to sing the words which she cannot speak."

In the choir we were all blown away the first time we heard Mary sing. With a beautiful voice that ranges from alto to soprano, her mastery of notes and range is a real asset to the choir. But the incredible thing is hearing her utter sentences with no trouble.

Just minutes earlier we'd all been trying to guess what Mary meant in our conversation, with only limited words available to her. Then in song, the same person was belting out the lyrics to 'I'd like to teach the world to sing". And at the end of our rehearsal we were all treated to a solo rendition of "Now is the hour".

But it was her performance of 'Silent Night' at the CBR Christmas party that confirmed her as a star. It was truly a miraculous transformation and a prime example of the mysteries of the brain.

Laura Fogg

Choir sessions run every other Monday lunchtime and Thursday evening. The choir will start rehearsals again from 18th January. Please see our website: www.cbr.auckland.ac.nz

With thanks to:

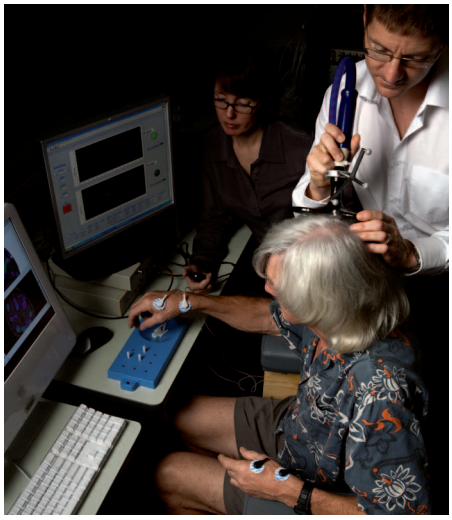
Cilla Barkhuizen
Associate Professor Roger Booth
Vicki Connor
Alison Cooper and the Raukatauri Music Therapy Centre
Ellen Giles
Dr Linda Hand
Natasha Grimsey
Virginia Hogg
Eric Kim
Sylvia Leao
Colin Mak
Emma Jane Opie
Associate Professor Suzanne Purdy
Dr Yogini Ratnasabapathy
Dr Cathy Stinear
Dr Lynette Tippett
Angela Tsai

The choir is supported by Music Therapy New Zealand who kindly provided a grant from the Lindgren Project Fund.

Learning from lazy eye

"If mice and men are the same, then we're looking at an everyday drug that can restore vision. Not only that, it could promote recovery and rehabilitation for stroke patients. We're aiming to prove it one way or the other." Dr Ben Thompson, Department of Optometry and Vision Science

It's a wild claim, but one that Dr Ben Thompson and an experienced team at the Centre for Brain Research are better placed than most to research. In a new study involving six research teams at the CBR, the impacts of a common anti-depressant on brain plasticity will be comprehensively assessed. The results may have huge implications for drug prescribing and promise to change the way we view rehabilitation and learning.



Left: Dr Ben Thompson running visual learning tests

Right: Dr Cathy Stinear and Associate Professor Winston Byblow using transcranial magnetic stimulation

The saying goes that you can't make an old dog learn new tricks. Indeed, it's a neuroscience dogma that as we age, our brains become less able to change. An injury or disease gained later in life is much harder to recover from than one in childhood, with certain developmental patterns becoming 'hardwired'. Yet what if you could pop a pill that would reset the brain, taking it back to the early, flexible stages of our development?

The pill in question is fluoxetine, better known as 'Prozac'. This is a type of selective serotonin reuptake inhibitor (SSRI), an anti-depressant which increases the levels of our 'happy hormone' serotonin. Serotonin is a neurotransmitter which carries messages between brain cells, over a gap called the synapse. SSRIs inhibit reuptake of serotonin at the presynaptic cell, so increasing the levels of serotonin available to bind at the postsynaptic receptor. With more serotonin available at synapses, the more 'happy' messages our brain receives.

"If this drug can really help the brain to learn new tasks, then we're onto an entirely new treatment option."

Fluoxetine is one of the most commonly prescribed anti-depressants, used for treating major depression and obsessive-compulsive disorder in both children and adults as well as bulimia nervosa, anorexia nervosa and panic disorder. But can we now add learning and rehabilitation to that list?

Lazy Brain

In 2008, the neuroscience world was turned on its head when Science published a seminal paper about amblyopia. This disorder of eye development means sufferers have a 'lazy eye', or more accurately a 'lazy brain'. If the eyes are not aligned properly, the developing brain can 'ditch' one as it struggles to make sense of the sensory information it's receiving. Over time, the brain cells receiving information from the neglected eye fail to forge proper connections within the brain, and therefore the affected eye delivers poor vision for life. Amblyopia affects 1-5% of the population and was thought to be incurable in adulthood.

Yet Maya Vetencourt and his Italian research team showed that amblyopic rats given daily doses of fluoxetine could correct the defect and achieve perfectly normal vision. Not only that, but perfectly healthy adult rats could be given ambylopia when receiving the drug, which was thought to be impossible because the adult brain isn't normally able to alter its sensory function so radically. The team proposed that SSRIs helped the rat's visual centre to rewire itself by forming new synapses and altering the strength of existing connections, which are essential elements of brain plasticity. The easier it is for the brain to make or break synapses between brain cells, the more plastic it is and the easier we can learn.

Reading this article was Dr Ben Thompson, a British psychologist with a special interest in amblyopia. He was about to take up a new position at The University of Auckland in the Department of Optometry and Vision Science, and it seemed like a great new project to get his teeth into. "I first became interested in amblyopia as part of my work in the US and Canada looking at how the brain can change and learn," he says. "Amblyopia is held up as the premier model for visual cortex plasticity. In childhood all our brain connections are laid down, and in adulthood it gets really hard to change them. So if you can treat amblyopia in adulthood then you've found a way to modulate plasticity in the brain. I began to think why stop there?!"

On arrival in New Zealand, Ben contacted Associate Professor Winston Byblow and the Movement Neuroscience team at the Tamaki campus. They were undertaking world-leading research into movement rehabilitation after stroke or brain injury. Central to this work is brain plasticity. For a stroke patient to move again after the movement cortex has been damaged, the brain has to learn new ways of performing the old tasks. "The two research themes come down to brain plasticity and learning new tasks," says Ben. "If this drug (fluoxetine) could really help the brain to do that, then we're onto an entirely new treatment option. And that's when we started to get really excited."

Funding success

Back in the present day and Ben is now the Principal Investigator of a Marsden Fast Start grant for $300,000, one of the most prestigious funding bodies in New Zealand. With help from the New Zealand Optometric Vision Research Foundation and the Oakley Mental Health Research Foundation, Ben is also the linchpin for a vast research team investigating all angles of the anti-depressant's learning capabilities.

"There aren't many places in the world where you can just knock on the door of a Professor and ask to collaborate!" laughs Ben. "But the research environment here in New Zealand is different; it actively encourages the sharing of resources and knowledge. And now with the establishment of the Centre for Brain Research, we've got a powerful research team answering some of the over-arching questions in neuroscience."

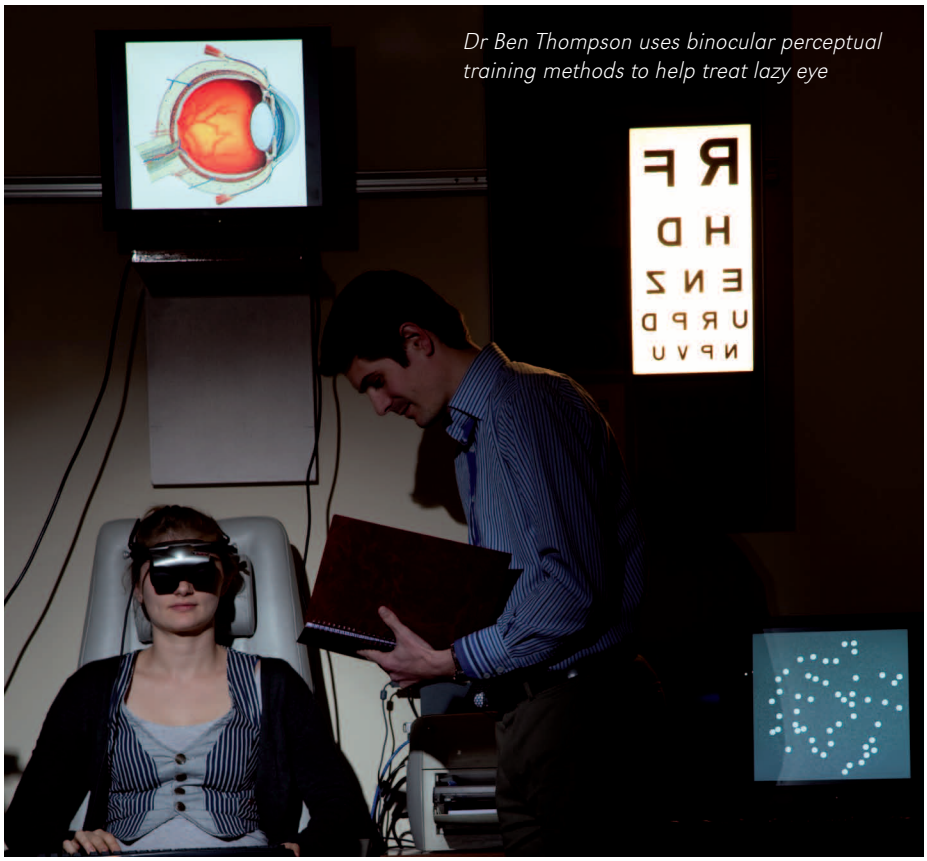
As the Head of Psychological Medicine, Professor Rob Kydd was central to getting the project up and running. But he soon had questions of his own; "If fluoxetine really does promote brain plasticity, then we want to encourage that as much as possible, as it means people can learn new lifestyle choices quicker. Yet doctors often prescribe anti-depressants in conjunction with anxiolytics to reduce anxiety. The problem is they've been shown to reduce brain plasticity."

"If that's right, then we'll have to rethink all our treatment regimes for patients," says Rob, who's a practising psychiatrist. "This study will have huge implications for science and clinical care."

"There aren't many places in the world where you can just knock on the door of a Professor and ask to collaborate! But the research environment here in New Zealand is different; it actively encourages the sharing of resources and knowledge."

Other members of the Centre for Brain Research are also contributing their expertise to the study. Ben is leading the visual testing side of the project, first examining the visual learning skills of people with normal sight, and then people with amblyopia.

Dr Cathy Stinear is heading up the Movement Neuroscience team to investigate the effects on the motor cortex. "We're using a technology that induces temporary plasticity in the motor cortex," says Cathy. "We first test the excitability or activity of each person's cortex. We then induce plasticity in that region, and test again. The hypothesis is that people on SSRIs will have more plastic brains, and so we'll see a bigger response to the test."



Dr Ben Thompson uses binocular perceptual training methods to help treat lazy eye

Dr Bruce Russell's group in the School of Pharmacy will investigate how quickly the anti-depressant takes effect, as well as correlating which people show the most response to the drug. Using genetic tests, the team aim to find out if this corresponds with different brain chemical receptor subtypes, such as BDNF and serotonin. If they do find a link it could hugely improve treatment options for depression, as patients could receive a drug that works quickly and is tailored to their needs.

A chance meeting in the Medical School car park led to the involvement of Pharmacology researcher Professor Mike Dragunow; "It sounds really funny, but that's how it happened! I bumped into Rob Kydd on the way home and we started talking about our latest research. The next thing I knew I'd signed up to take part - that's the beauty of the CBR!" Mike will work with Dr Scott Graham and PhD students Pritika Narayan and Amy Smith to investigate biochemical and cellular markers in blood cells of people taking SSRIs. They will look for the drug-induced epigenetic changes that control how our genes are read and will also study blood cell function in the lab, to try to understand more about how SSRI's work on the body.

It's an impressive line-up of researchers as well as an impressive list of questions, but the researchers aren't daunted.

"Oh no, on the contrary, it just makes me more excited!" says Cathy. "It's really the first time that the effects of a drug on excitability, plasticity and learning have been tested on two different cortex areas at the same time. As well as that the clinical implications are huge. You know, we have no idea what the combined effects of taking both an antidepressant and an anxiolytic are for plasticity in the brain - it's unbelievable!"

And of course there are the clinical implications for people with lazy eye. "We're already developing new therapies to treat adults with amblyopia," says Ben. "But if we can add in a boost from this drug, well it could mean we help people to see again." Results from the project won't be completed for another two years, but they'll be eagerly anticipated across the board.

Recruitment

The team is looking for healthy adult males to take part in the study. You need to be aged between 18 and 40, and able to attend several research sessions. Please contact Dr Ben Thompson for more information through cbr@auckland.ac.nz

CBR Seminar Series stimulating new collaborations

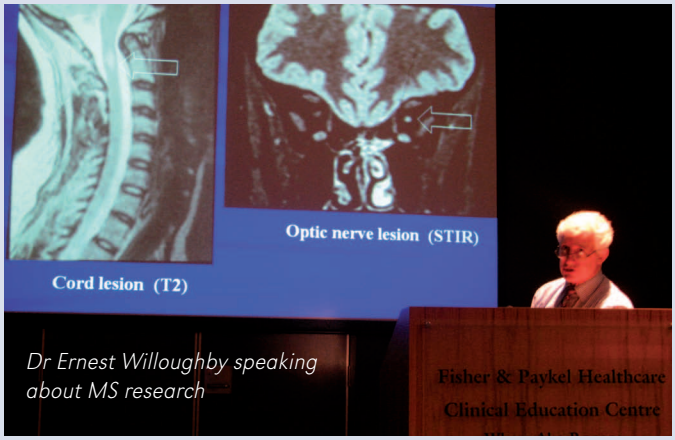
The CBR Seminar Series has enjoyed a successful first few months

The series combines clinical and scientific speakers to provide a broad spectrum update on different diseases. Uniquely, the series also allows time for blue sky discussions on research topics and directions. The hope is to encourage and stimulate new research directions and collaborations in the University and the regional District Health Boards.

The ultra-modern backdrop of Auckland City Hospital's Clinical Education Centre has provided a fitting location for each seminar. The topics have ranged from advances in Parkinson's disease treatments, research resulting from epilepsy surgery, early diagnosis of Alzheimer's disease, and updates on MS research and treatment. Around 100 people from across the University, ADHB and community NGOs have attended each talk.

Lunches following each seminar have been kindly provided by the Neurological Foundation of New Zealand, and have proved a fertile ground for conversation! Our thanks go to the Neurological Foundation for recognising the vital need to encourage collaboration across the sciences to ensure we find and develop new treatments for brain disease.

For more information, please contact Dr Johanna Montgomery at: jm.montgomery@auckland.ac.nz



Dr Ernest Willoughby speaking about MS research

Upcoming Seminars in 2010

February 11th	**BrainWaves Seminar** Huntington's disease Level 5 Medical School
February18th	**CBR Seminar** Stroke, Level 5 Auckland City Hospital
March 11th	**BrainWaves Seminar** Cell culture, Level 5 Medical School
March 25th	**CBR Seminar** Creatine in HD, Level 5 Medical School
April 8th	**BrainWaves Seminar** Language, Level 5 Medical School
April 22nd	**CBR Seminar** Hearing and Deafness, Level 5 ACH

BrainWaves!

Connecting emerging neuroscientists

The CBR young scientists have been going from strength to strength since the formation of the Emerging Scientists Committee in July 2009. The aim is to continue the excellent activities of the Auckland Neuroscience Network and encourage emerging neuroscientists to develop and present their research.

With a new name of 'BrainWaves', the group is now gaining a momentum of its own. So far, the team behind BrainWaves have organised a very successful statistics workshop for students, as well as two stimulating seminars.

Held in the heart of the Centre for Brain Research on the fifth floor of the Medical School, the seminars have both been packed to capacity. October's seminar featured speakers from the Department of Psychology and the Department of Physiology on the topic of 'Memory', and the December speakers from the School of Pharmacy and Department of Psychology spoke on the techniques used in 'Imaging the Brain'.

If you would like to help BrainWaves, please contact the chair Dr Simon O'Carroll at: s.ocarroll@auckland.ac.nz

BrainWaves sub-committee liaison officers:

Social: Carolyn Wu
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Seminars: Amy Smith
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Outreach: Thomas Park and Hiljanne Van der Meer
cbrbrainwaves.outreach@auckland.ac.nz

New stroke unit at ACH

Auckland City Hospital's new stroke ward is a model for New Zealand

Professor Alan Barber is the Head of Stroke Services at Auckland District Health Board

Stroke patients admitted to ACH will now be treated in their own dedicated ward area. The new 15 bed stroke unit at Auckland City Hospital opened in November, and is seen as the premier facility for stroke care in New Zealand. It's one of only five similar units in the country amongst the 21 District Health Boards.

Having a dedicated facility like this is amazing for patients," says Professor Alan Barber, who is the head of Stroke Services at Auckland City Hospital and the Deputy Director of the CBR. "Research shows that for every 20 patients cared for on a dedicated stoke ward as opposed to a general medicine ward, you prevent one from dying or getting a disability. So that means they can get up from the hospital bed and walk away independent. That's priceless."

The capacity for neurology beds in the hospital has now doubled, meaning neurological patients will receive greater time, care and attention. Patients in the stroke unit are looked after by dedicated stroke neurologists, nurses and health professionals like speech therapists and occupational therapists.

Alan asserts that the unit raises the profile and standards of neurology care in both the hospital and the Centre for Brain Research. "The whole emphasis of this unit is on recovery and rehabilitation of stroke patients. Research into improving stroke care and treatment is also easier, as everything is in one place. We can now expand the number of patients enrolled in trials, so we can test new medicines, new strategies for recovery and gather more information about stroke epidemiology.

"Research shows that for every 20 patients cared for on a dedicated stoke ward as opposed to a general medicine ward, you prevent one from dying or getting a disability."

Current stroke trials underway in the stroke unit and Centre for Brain Research include the AVERT trial investigating new techniques in physiotherapy, and a trial looking at whether methods to 'prime' the brain improve the chances of rehabilitation. As the first Neurological Foundation Chair of Clinical Neurology, Professor Barber instigated using clot busting drugs to reduce the impact of strokes. He was the first person in the country to do this.

The clinical team is now leading the nation by using high-tech neuro-interventional therapies. Within hours of a stroke, the neurosurgery teams can inject clot-busting drugs directly into the blocked arteries to clear the clot. Studies in brain imaging techniques also mean the team can select patients who will benefit most from the surgery.

"It really is so exciting to be at the cutting edge and best practice of stroke care", says Alan. "It's good for research at the CBR to have this stroke unit virtually next door, and it's great for patients. Studies show people who take part in trials do better, even if they receive a placebo. All the monitoring involved in research means that patients receive greater care and attention from our medical teams."

Julius Brendel Trust

In February the CBR Seminar Series will focus on stroke to coincide with the annual meeting of the Julius Brendel Trust. This private neurology trust supports continuing education and career development to help improve neurological care in Auckland.

The annual meeting attracts international speakers to New Zealand to facilitate the exchange of ideas and practices in neurology. Visiting speakers spend three days on the wards with Auckland neurologists and then continue with a two day symposium.

The topic of this year's meeting will be stroke treatment and rehabilitation. The speakers are Dr Werner Hacke from Germany and Dr Mark Parsons from Australia. This will be a fantastic opportunity to hear from two of the major world figures in stroke research.

Brendel Meeting: 15th - 19th February
CBR Seminar: 18th February

Grants

Researchers across the Centre for Brain Research have had great success in the latest funding rounds

Here we have compiled the summer 2009 results, illustrating that we really are 'working together to improve lives'. If you have any funding or other successes then please let us know for our next newsletter! cbr@auckland.ac.nz

New Caledonian Crows manufacture tools - but does that make their brains different to other birds?

Marsden Fund

Four research teams achieved great success in the 2009 Marsden Fund, receiving more than $2 million for blue sky projects over the next three years.

Crafty crows will come under intense scrutiny by neuroethology researchers Professor Russell Gray and Dr Fabiana Kubke. Along with researchers Alex Taylor and Dr Gavin Hunt, the team has secured $795,000 to identify the cognitive abilities of different species of crow. They aim to analyse the neural specialisations associated with tool manufacture and tool use by New Caledonian crows. This unique species of crow is only found on the islands of New Caledonia, and has evolved complex manufacturing processes to make a variety of leaf, stick and twig tools. The team will now examine whether their brains are different to other crows thanks to their unique abilities.

The wiring of human brains will also come under scrutiny from Professor Peter Thorne and Dr Johanna Montgomery. As we grow and develop, our brains have to form the correct synaptic connections in order to receive information from our senses. Without the correct connections, our brain can't receive the right information, resulting in lifelong problems such as deafness. The team has received $841,000 to investigate how these correct synaptic connections are maintained in order to ensure correct sensory function.

Dr Maurice Curtis received a Fast Start grant for $300,000 to continue his research into stem cells in the human brain. His research hit the headlines in 2003 and then 2007 after the momentous discovery with Professor Faull that humans can still make new brain cells, and that they are continually travelling through the brain to replenish dying cells. He now hopes to identify the source of this stem cell stream.

Dr Ben Thompson and Dr Cathy Stinear also received a Fast Start grant for $300,000 to look at brain plasticity. More on this can be seen on page 8.

These are by no means exhaustive lists, and we apologise if there are any small inaccuracies.

Health Research Council

2009-12 Programme Extension $3,581,134
Gunn A, Bennet L, Green C, Fraser M, Nicholson L. Pathogenesis, detection and treatment of perinatal brain injury

2009-12 Project Grant $2,675,265
Feigin VL, Barker-Collo S, McPherson K, Kydd R, Barber PA, Wilde N, Parag V, Brown P, Starkey N, Dowell T, Kahan M.
Traumatic brain injury in New Zealand: a population based incidence study.

2009-12 Project Grant $1,300,000
Thorne P, Vlajkovic S. Abnormal Ion Homeostasis in Inner Ear Disease

2009-12 Project Grant $812,955
Byblow WD, Stinear CM, Barber PA, Anwar S. Priming to enhance rehabilitation after stroke

2009-12 Emerging Researcher Grant $149,971 Thompson B, Byblow WD & Hess R. Promoting neural plasticity to recover visual function in amblyopia

2008-11 Health Research Council (continuation) $3,381,503 Faull R, Dragunow M, Connor B and Waldvogel W
Neurogenesis and neurodegenerative disorders of the human brain

University of Auckland

2009-10 FMHS Project grant $75,000
Vlajkovic, S. FDRF: Oxidative stress in the cochlea

2009-10 School of Medicine Foundation Project $61,666
Nicholson L. Identifying targets to halt the progression of Parkinson's Disease

2009 University of Auckland Research Council Early Career Research Excellence Award. $30,000. Stinear CM. Promoting neural plasticity with anti-depressants

2009-11 UARC Faculty Research Development Fund $29,997
Gant N & Byblow WD.

2009-10 UniServices GATE funding $190,000
Searchfield G. Virtual (3D) sound therapy for tinnitus

Other sources

2009-10 CatWalk Spinal Cord Injury Trust $99,706 O'Carroll S, Nicholson L, Green C
Regulation of cell to cell communication for spinal cord injury - taking the next step.

Neurological Foundation

The Neurological Foundation of New Zealand has awarded nearly one third of its 2009 funding round to scientists at the Centre for Brain Research. Over $400,000 will go to six research groups across the Centre.

Associate Professors Tom Brittain and Nigel Birch along with Dr Joanna Skomer from the School of Biological Sciences were granted $111,177 to progress their research on the relatively newly discovered protein neuroglobin. It's thought the protein protects brain cells from the cell death or damage seen in brain disease. The funding will enable the team to investigate the structure of the protein, and could lead to the design of small molecules which might potentially be used to reduce the brain damage which follows stroke or neurodegenerative diseases such as Alzheimer's disease.

Stroke research also received a boost, with $105,623 awarded for a new clinical trial aiming to improve rehabilitation outcomes after long-term stroke. Leading the team is Dr Cathy Stinear from the Neurology Research Unit in the Faculty of Medical and Health Sciences, along with Professor Alan Barber who is the Deputy Director of the CBR, and Professor Winston Byblow's Movement Neuroscience team in the Department of Sport and Exercise Science. Thanks to their work on a high-tech method to 'prime' the brain for therapy, chronic stroke patients could now be treated even years after their stroke. Patients will receive a two week burst of physiotherapy for their hand and arm, alongside a non-invasive magnetic stimulation technique which primes the brain for a better response to therapy. The trial may lead to further functional recovery in people with stroke, and lessen the ongoing burden of stroke on patients and their families.

Graduate student Amelia van Slooten received a prestigious Miller Postgraduate Scholarship to continue her studies, worth $84,000. Her work aims to find out if a new peptide therapy can reduce inflammation in the brain following stroke, thereby allowing new brain cells to replace the damaged area.

A new perspective on the causes of depression will be investigated by Associate Professor Bronwen Connor and Dr Alisa McGregor in the School of Medical Sciences. The team will research the effects of chronic stress and how changes in the brain could relate to the onset of depression. MS research and stem cell therapies were also boosted with more funding.

A/P Bronwen Connor and graduate student Natasha Naidu both received funding

The Neurological Foundation has also facilitated two generous philanthropic donations from the Douglas Charitable Trust.

2009-11 Douglas Research Award in Partnership with the Neurological Foundation. $183,066 Connor B, Gordon R.
The role of chemokines in directing progenitor cell migration following brain injury

2009-11 Douglas Research Award in Partnership with the Neurological Foundation $119,000 Lipski J.
KATP channels and survival of nigral dopaminergic neurons during oxidative stress: neuronal silence may not always be golden.

2009-11 CHDI US$1,200,000
Snell R, Faull R Transgenic sheep model of Huntington's Disease

2009 District Health Board Research Fund (HRC and DHBNZ) Project Extension $60,000 Connolly M, Moffitt A, Lawrenson R, Kenealy T, Kerse N, Doughty R, Arroll B, Barber A, Brown P, Kolbe J, Devlin G.
Alleviating the burden of chronic disease in New Zealand. The ABC NZ study.

2009 Julius Brendel Trust Equipment Grant $51,000 Barber PA, Stinear CM.
Transcranial Magnetic Stimulation

2009 Lotteries Health Board Project Grant $71,982 Montgomery J.
Molecular mechanisms of synapse rewiring in the brain

2008-11 Marsden Project Grant (continuation) $664,000
Addis D, Corballis M. Back to the future: How the brain uses the past to imagine the future.

2009-11 Maurice and Phyllis Paykel Trust Grant-in-Aid $30,000
Nicholson L, Green C, Shaikh S, O'Carroll S, Wan C. MPPT: mind the gap- could connexins be key players in neuronal differentiation?

2010-11 Maurice and Phyllis Paykel Trust Grant-in-Aid $15,200
Vlajkovic, S. MPPT: The role of NADPH oxidases in cochlear response to oxidative stress

2009 Maurice and Phyllis Paykel Trust Grant-in-aid $9,000 Montgomery J.
Mechanisms controlling synapse plasticity

2009-11 Oakley Foundation $7,600
Stinear CM, Kydd R, Byblow WD, Russell R & Thompson B. Biomarker identification for individual SSRI prescription

2009-11 National Alliance for Research on Schizophrenia and Depression US$100,000
Connor B. Stress, Neurosteroids and Depression

2009-11 New Zealand Optometric Vision Research Fund. $18,000
Thompson B, Stinear CM, Byblow WD, Kydd R & Russell B. Promoting plasticity in visual cortex with anti-depressant drugs

2009-11 Stroke Foundation Fellowship $130,000 Barber PA, Stinear CM, Byblow WD.

Successes

Ian Houston Award for Sustained Excellence in Job Performance

"It is an honour to receive this award, but it's the families who have given me the greatest gift of all. They have given me their trust." In typical understated and elegant fashion, Jocelyn Bullock recently collected her award for 35 years of service to FMHS.

The Ian Houston Award for Sustained Excellence is awarded to two staff members each year and acknowledges continuous outstanding effort in the performance of duties over multiple years in support of the Faculty's mission. Karn Hinton from the Department of Physiology was also the 2009 recipient. For over twenty years Jocelyn has developed and managed the human brain tissue donor programme at FMHS, which led to its official recognition as the Neurological Foundation of New Zealand Human Brain Bank in 1993. She has been instrumental in establishing close links with families, morticians and community groups to ensure the ethical and sensitive storage of the tissue.

Her work was especially appreciated by Verna Currey's whānau in Wellington. Verna's husband John had Huntington's disease and wanted to donate his brain to research. This was challenging because of Maori cultural sensitivities but close consultation with Verna and the research group enabled this special gift to happen after John's death. "Verna blessed me with a special title," says Jocelyn. "She called me the kaitiaki, the guardian, of the Human Brain Bank. It is a title I accept on behalf of all the donors who have entrusted us with such a special bequest."

Honours

Professor Peter Thorne

Congratulations to Professor Peter Thorne who was made CNZM for his services to auditory neuroscience. This honour is just recognition of not only his contribution to audiology but acknowledges the enormous service he has given community and NGO groups. Peter leads the Hearing and Deafness group in the Centre for Brain Research, is a key member of the Department of Physiology and also heads the School of Population Health.

Professor Alistair Gunn

Professor Alistair Gunn joins six other members of the Centre for Brain Research as a Fellow of the Royal Society of New Zealand. Alistair heads the Department of Physiology and co-directs the Fetal Physiology research group in the CBR. He was recognised for his research on the major causes of death and disability in early childhood and prevention of life threatening events in infancy.

Promotions

There were more celebrations in the Fetal Physiology team with the appointment of a personal professorial chair to Laura Bennet. Professor Bennet's research spans studies of fetal function, from the kidney and heart to the pathogenesis of brain injury and the development of neuroprotection strategies.

Congratulations also go to Louise Nicholson who has been promoted to Professor. Louise is the FMHS Associate Dean of Research and also PI of the Molecular Neuroanatomy Lab in the Department of Anatomy with Radiology. Louise has also been the driving force behind the highly successful but very demanding neuroscience initiative, the Brain Bee Challenge.

There were more successes in the Department of Anatomy with Radiology, as Dr Fabiana Kubke and Dr Maurice Curtis were both made Senior Lecturer.

Debbie Young has also been promoted in the Department of Pharmacology and Clinical Pharmacology. Associate Professor Young leads the Molecular Neurotherapeutics team in the CBR, investigating gene therapy in brain disease.

Awards and graduations

Sir Charles Hercus Health Research Fellowship

Dr Scott Graham from the Department of Pharmacology and Clinical Pharmacology has been named a 2010 recipient of the Sir Charles Hercus Health Research Fellowship. The fellowship will support Dr Graham's research on CB2 cannabinoid receptors and their potential role in neuroinflammation. Inflammation is a hallmark of most neurological diseases and it is thought that reducing inflammation may help to protect the brain.

Lab Successes

- Associate Professor Michelle Glass received the Young Investigator of the Year award at the International Cannabinoid Research Society meeting in Chicago. Michelle is the PI of the Receptor Signalling laboratory, in which Dr Scott Graham also works. Michelle's PhD students Emma Daniel and Megan Dowie are also in for congratulations, having both successfully defended their thesis. Emma has received a FORST scholarship to work at Professor Chris Shaw's laboratory in Cambridge.
- In Dr Fabiana Kubke's lab Jeremy Corfield was conferred his PhD on modelling the brains of kiwis and other birds. He was also awarded the Miguel Caneiro Inaugural fellowship to attend the JB Johnston Club and Society for Neuroscience meeting.
- In Associate Professor Louise Nicholson's lab Jinny Yoon has completed her PhD and had her oral examination while Ia Cheverya has also just submitted.
- In Professor Richard Faull's group, Alissa Nana graduated her PhD and will continue with post-doctoral work thanks to the support of the Matthew Oswin Memorial Trust.
- There were congratulations all round in Associate Professor Bronwen Connor's lab. Elena Vazey, Renee Gordon and Andrew Tattersfield have completed their PhDs, while Amelia Van Slooten and Natasha Naidu have completed their honours projects. Amelia and Natasha both received funding from the Neurological Foundation to continue their studies.
- Pritika Narayan in Professor Mike Dragunow's lab won the second runner up prize for her talk on "Increased histone acetylation in the Alzheimer's disease brain" at the National Research Centre for Growth and Development Science Symposium held recently in Hamilton. Also in Mike's group, Amy Smith has been awarded a Tertiary Education Council Top Achiever Doctoral Scholarship.

Volunteers wanted!

Centre for Brain Research seeks participants to help fight brain disease

Neuroscientists at the CBR have launched a new database to help further research into brain disease. The Research Volunteer Register encourages interested members of the public to sign up to help studies at the Centre for Brain Research. When a suitable project comes up that matches their details, participants will be contacted to inform them of the research.

The database will allow scientists to undertake vital research into devastating neurological conditions such as Alzheimer's disease, stroke, Parkinson's disease and motor neurone disease. Research into mental health problems such as depression and addiction is also in progress. Professor Richard Faull, the Director of the Centre, says, "Human volunteers are essential to enable our researchers to learn more about how the brain works, both normally and in disease. We're asking for people with no neurological conditions to help as well as people with brain disease, as our research projects also need control subjects to verify our results."

Current projects underway include an examination of the best rehabilitation methods for individual stroke survivors, ensuring a personal treatment plan for each patient. The use of anti-depressants after stroke to encourage rehabilitation is another exciting possibility which is being investigated in the Centre, and is featured in this newsletter on page 8. Drug use and addiction to illegal substances like 'P' is also currently being examined for their effects on the brain. Research methods include MRI scans, Diffusion Tensor Imaging to examine brain connections, Electroencephalogy (EEG) to study 'brainwaves' and movement clinics to observe body control.

Dr Cathy Stinear is a stroke researcher and the creator of the Research Volunteer Register. "I work with patients just hours after they've had a stroke, and it really motivates me to do more research into devastating conditions like this," she says. "It struck me that having a resource of willing volunteers to help us in our research would speed up the scientific process, and as a result help us to identify and develop new treatments for brain disease. Working together like this is such a great example of what the Centre for Brain Research can do."

Many research projects at the CBR require human volunteers

The database can be found on the CBR website:

http://www.fmhs.auckland.ac.nz/faculty/cbr/contact/volunteers.aspx

Would you like to receive all the latest news from the Centre for Brain Research?

Join the CBR Connections database!

Email cbr@auckland.ac.nz or fill in this form and return to the address overleaf. You can also place the slip into an envelope and use the FreePost number and address.

Name

Address

Email address

Would you like to join the Research Volunteer Register?

All information on the Centre for Brain Research database is protected by the Privacy Act.

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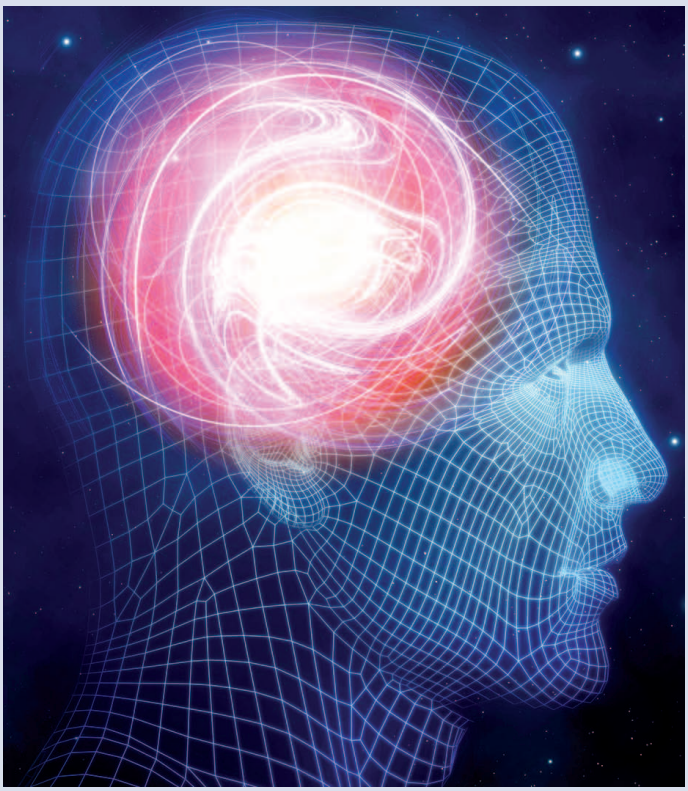
Brain Day 2010



Join us for Brain Day 2010!

Saturday March 20th 2010
10am - 5pm

- Learn all about how your brain works
- Find out about the latest research and treatment trials for many neurological disorders
- Meet our scientists, clinicians and community groups
- Experience science in action with hands on experiments

A fun, free event for all the family!

Contact Laura Fogg at cbr@auckland.ac.nz or 09 923 1913 for more information

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Held in association with the Neurological Foundation.

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