33RD
INTERNATIONAL CONFERENCE

AWCBR

Australasian Winter Conference
on Brain Research

2015
Programme and Abstracts

29 August to 2 September 2015
Copthorne Hotel, Queenstown, New Zealand
www.awcbr.org

Saturday 29 August

12.00-5.30 pm		BRNZ Core Session
3.00-5.15 pm		Registration, Copthorne Resort Hotel
5.30-6.00 pm		Student Meet and Greet
6.00 pm		Opening Reception, Cash Bar
7.00 pm		Opening Remarks
7.15 pm	1.1	**PLENARY LECTURE:** **George Koob, *National Institute Alcohol Abuse and Alcoholism, United States of America*** Neurobiology of addiction: Cerberus revisited

1. Neural Excitability, Synapses, and Glia

Chair: Karl Iremonger

8.00 pm	1.2	**John Reynolds, *University of Otago, New Zealand*** Dissociation between changes in cellular excitability and synaptic plasticity measured in single cells in the motor cortex following transcranial magnetic stimulation
8.15 pm	1.3	**Owen Jones, *University of Otago, New Zealand*** Astrocytes mediate heterodendritic metaplasticity in hippocampus
8.30 pm	1.4	**Antonio Berretta, *University of Otago, New Zealand*** Astrocytes selectively regulate the expression of neuronal GABA-A receptor subunits
8.45 pm	1.5	**Xinhuai Liu, *University of Otago, New Zealand*** Optogenetic activation of rat GnRH neurons
9.00 pm	1.6	**Megan Elder, *University of Otago, New Zealand*** Secreted amyloid precursor protein alpha regulates protein synthesis in primary hippocampal neuronal cultures
9.15 pm	1.7	**Erin Cawston, *University of Auckland, New Zealand*** Distinct temporal fingerprint for cAMP signalling of indole-2-carboxamides as allosteric modulators of the cannabinoid 1 receptor

Sunday 30 August
Morning Session

6.00-8.00 am — Light Breakfast Available

8.00 am 2.1 **PLENARY LECTURE:**
Michael Bruchas, *Washington University, United States of America*
Modern approaches for dissecting neuromodulation and signaling in affective behavior

2. Basal Ganglia Health and Disease (I)

Chair: Richard Faull

8.45 am 2.2 **Sonja Seeger-Armbruster, *University of Otago, New Zealand***
Optogenetic stimulation of motor thalamic terminals modulates motor cortex activity in freely moving Parkinsonian rats

9.00 am 2.3 **Rachel Sizemore, *University of Otago, New Zealand***
Complex GABAergic innervation onto ventral tegmental dopamine neurons

9.15 am 2.4 **Dorothy Oorschot, *University of Otago, New Zealand***
Delayed post-treatment with bone marrow-derived mesenchymal stem cells is neurorestorative of striatal medium-spiny projection neurons and improves motor function after neonatal rat hypoxia-ischemia

9.30 am 2.5 **Simon Fisher, *University of Otago, New Zealand***
Reinforcement signals critically modulate spike timing-dependent plasticity in the striatum

9.45 am Tea/Coffee break

Sunday 30 August
Morning Session

3. Basal Ganglia Health and Disease (II)

Chair: Dorothy Oorschot

10.00 am	3.1	**Mark Burrell, *University of Auckland, New Zealand*** A novel electrochemical approach for interrogating tonic and phasic dopamine signals in the nigrostriatal pathway
10.15 am	3.2	**Peter Freestone, *University of Auckland, New Zealand*** An optogenetic study of endocannabinoid mediated modulation of dopamine neuron activity
10.30 am	3.3	**Samantha Murray, *University of Auckland, New Zealand*** Neurochemical changes in the striatum in a transgenic ovine model of Huntington's disease
10.45 am	3.4	**Malvindar Singh-Bains, *University of Auckland, New Zealand*** Globus pallidus neurodegeneration links to symptom heterogeneity in Huntington's disease

Sunday 30 August
Afternoon Session

3.30 pm — Afternoon Tea Available

4.00 pm — 4.1 — **PLENARY LECTURE:**
David Glanzman, *University of California, Los Angeles, United States of America*

Reinstatement of long-term memory in Aplysia following reconsolidation blockade

4. Cognition and Behaviour (I)

Chair: Maurice Curtis

4.45 pm — 4.2 — **David Young, *Victoria University of Wellington, New Zealand***

Preclinical anti-addiction and side effect profile of the novel kappa-opioid receptor agonist 16-ethynyl Salvinorin A

5.00 pm — 4.3 — **Dane Aronsen, *Victoria University of Wellington, New Zealand***

The role of 5-HT1A and 5-HT1B receptors in MDMA self-administration

5.15 pm — 4.4 — **Vaidenska Juozaityte, *Monash University, Australia***

Novel role of the ETS-5 transcription factor in exploratory behaviour

5.30 pm — 4.5 — **Stuart McGill, *University of Auckland, New Zealand***

Investigating the effect of conditional probability on reinforcement evoked potentials

Conference Dinner

7.30 pm

Skyline Restaurant

Tickets must be purchased in advance.
The ticket includes return gondala transport to the restaurant.

The Skyline is a licensed restaurant but wine and beer will be provided.
The function room will be open from 7.00 pm,
with dinner commencing at 7.30 pm

Musical entertainment will be provided.

Monday 31 August
Morning Session

6.00-8.00 am — Light Breakfast Available

8.00 am — 5.1 — **PLENARY LECTURE:**

Peter Mombaerts, *Max Planck Research Unit for Neurogenetics, Germany*

An inconvenient truth: Trpc2-expressing sensory neurons in the mouse main olfactory epithelium

5. Cognition and Behaviour (II)

Chair: Bronwyn Kivell

8.45 am — 5.2 — **Robert Munn, *Stanford University, United States of America***

Mechanisms of function and control of the grid cell/head direction cell spatial navigation system in entorhinal cortex

9.00 am — 5.3 — **Kyla-Louise Wood, *University of Canterbury, New Zealand***

Neuropsychiatric status and different MCI criteria in Parkinson's disease

9.15am — 5.4 — **Joan Leung, *University of Auckland, New Zealand***

Using Mismatch Negativity (MMN) to investigate perception of changes in affective prosody in Autism Spectrum Disorder (ASD)

9.30 am — 5.5 — **Ryan Ward, *University of Otago, New Zealand***

Enhanced motivation in an animal model of maternal immune activation in schizophrenia

9.45 am — Tea/Coffee break

Monday 31 August
Morning Session

6. Development and Novel Methods

Chair: John Dalrymple-Alford

10.00 am	6.1	**Sharon Olsen, *AUT University, New Zealand*** The Aalborg PAS-based brain computer interface: An investigation of the duration of cortical excitability in healthy adults
10.15 am	6.2	**Elshin Joel, *University of Canterbury, New Zealand*** Physiological models of neurovascular coupling and the relationship to BOLD signals in the ageing brain
10.30 am	6.3	**Katharina Dormanns, *University of Canterbury, New Zealand*** Multi-scale modelling of neurovascular coupling in “tissue-like” structures
10.45 am	6.4	**Christine de Lancea, *University of Canterbury, New Zealand*** Cerebral arterial circle with autoregulatory resistance
11.00 am	6.5	**Imran Niazi, *New Zealand College of Chiropractic, New Zealand*** Investigating the effects of electrical stimulation modalities paired with cortical potentials generated by motor imagination
11.30 am		Student Travel Grants Distributed

7. POSTER SESSION

- COMBINED WITH MEDSCI

NB: BEN LOMOND ROOM, RYDGES HOTEL

1.30 - 4.00 pm	Presenters will be in attendance during this time Presenters for Posters A will be in attendance from 1.30 to 2.45 pm Presenters for Posters B will be in attendance from 2.45 to 4.00 pm The poster session will be followed by a postgraduate dinner to the held at Winnies at 8.00 pm
7.1 - A	**Keat Foo, *International Medical University, Malaysia*** Neuroprotective role of Centella asiatica extract on hydrogen peroxide-induced SH-SY5Y cells
7.2 - B	**Sophie Barnett, *University of Canterbury, New Zealand*** Anterior thalamic nuclei lesions, environmental enrichment and histone H3 acetylation in the extended hippocampal system
7.3 - A	**Ross van de Wetering, *Victoria University of Wellington, New Zealand*** The selective D2 dopamine receptor antagonist eticlopride prevents the development of MDMA-induced behavioural sensitisation in rats
7.4 - B	**Brook Perry, *University of Canterbury, New Zealand*** Unequal effects of anterior thalamic nuclei and mammillothalamic tract lesions
7.5 - A	**Yukti Vyas, *University of Auckland, New Zealand*** The effects of Autism Spectrum Disorder associated Shank2 mutations on excitatory glutamatergic synapses
7.6 - B	**Jennifer Hamilton, *University of Canterbury, New Zealand*** Thalamic brain lesions, theta and memory
7.7 - A	**Christine Arasaratnam, *University of Auckland, New Zealand*** The distribution of DARPP-32 neurons in the normal and Huntington's disease human striatum

Poster Session

7.8 -B	**Helen Murray, *University of Auckland, New Zealand***
	Distribution of PSA-NCAM in the brain in neurodegenerative disease
7.9 - A	**Roseanna Smither, *University of Otago, New Zealand***
	Characterising ventroanterior motor thalamus inputs to motor cortex
7.10 - B	**Hanisah Azhari, *University of Otago, New Zealand***
	Enhanced uptake of drug into the brain when delivered in BBB-targeted cubosomes
7.11 - A	**David Moreau, *University of Auckland, New Zealand***
	Cognitive remediation interventions in learning disorders: Assessing the evidence with multiple Monte Carlo experiments
7.12 - B	**Hannah Best, *University of Otago, New Zealand***
	Correction of pathology in ovine cln5 Batten disease neural cultures
7.13 - A	**Meg Spriggs, *University of Auckland, New Zealand***
	Facial recognition memory and the BDNF Val66Met polymorphism: Disentangling the neural bases of recollection and familiarity
7.14 - B	**Robert Chow, *University of Southern California, United States of America***
	Use of single-cell RNA-Seq to molecularly define human Cajal-Retzius neurons
7.15 - A	**Stephanie D'Souza, *University of Auckland, New Zealand***
	Interactive effects of DAT1 genetic variants and the antenatal environment on childhood depressive symptoms
7.16 - B	**Nicole Taylor, *University of Auckland, New Zealand***
	Immersive exer-gaming and cognitive function in sedentary young adults
7.17 - A	**Wojciech Ambroziak, *University of Auckland, New Zealand***
	Mutant huntingtin alters NMDA receptor distribution by changing the balance between SAP97 isoforms
7.18 - B	**Brigid Ryan, *University of Otago, New Zealand***
	Regulation of MicroRNAs at dentate gyrus synapses after long-term potentiation induction in vivo
7.19 - A	**Amy Ewald, *Victoria University of Wellington, New Zealand***
	16-Bromosalvinorin a modulates dopamine transporter function in a kappa opioid receptor and erk1/2-dependent manner
7.20 - B	**Bronwen Gardner, *University of Auckland, New Zealand***
	Copper, zinc, iron, and manganese in the healthy and Parkinson's disease human brain

Poster Session

7.21 - A	**Leon Smyth, *University of Auckland, New Zealand***
	Characterisation of human brain pericytes in situ and in vitro
7.22 - B	**Jerome Plumat, *University of Auckland, New Zealand***
	Measuring the inner ear permeability using DCE-MRI
7.23 - A	**Richard Prentice, *University of Otago, New Zealand***
	Oleoylethanolamide incorporation into lipid nanoparticles for brain delivery: Physical characterisation and in vitro cytotoxicity
7.24 - B	**Jaya Prasad, *University of Auckland, New Zealand***
	Targeting insulin-like Growth Factor-1 signalling for treatment of preterm brain injury
7.25 - A	**Katherine Gunn, *University of Auckland, New Zealand***
	White matter and cortical brain injury in the very immature rat following lipopolysaccharide-induced mild systemic inflammation
7.26 - B	**Blake Porter, *University of Otago, New Zealand***
	The neural mechanisms of encoding effortful space
7.27 - A	**Nasim Mehrabi, *University of Auckland, New Zealand***
	Interneuron loss in the cerebral cortex correlates with symptom heterogeneity in Huntington's disease
7.28 - B	**Deanne Barwick, *University of Otago, New Zealand***
	Prefrontal cortex stroke disrupts cholinergic pathways and impairs learning
7.29 - A	**Panzao Yang, *University of Auckland, New Zealand***
	Vascular degeneration in Parkinson disease
7.30 - B	**James Miller, *University of Otago, New Zealand***
	Characterising the target innervations of glutamatergic neurons in the reticular thalamic nucleus
7.31 - A	**Anurag Singh, *University of Otago, New Zealand***
	TNFα mediated heterodendritic metaplasticity in the rat hippocampus
7.32 - B	**Lisa Zhou, *University of Otago, New Zealand***
	Prefrontal cortex stroke induces delayed impairment in spatial memory
7.33 - A	**Shadah Shadli, *University of Otago, New Zealand***
	Anxiolytic drug action in the stop signal task: α-asymmetry is not like goal conflict-specific rhythmicity

Poster Session

7.34 - B **Azam Shirrafiardekani, *University of Otago, New Zealand***

Interplay of spontaneous activity and metaplasticity in the computational model of the dentate granule cell

7.35 - A **Anna Forsyth, *University of Auckland, New Zealand***

Investigating the neural mechanisms of analgesic properties of anaesthetic drugs with MEG

7.36 - B **Dion Henare, *University of Auckland, New Zealand***

Electrophysiological components of attentional control predict individual performance on a concurrent working memory task

7.37 - A **Gagandeep Mallah, *University of Auckland, New Zealand***

Maternal cyclic-glycine-proline treatment during lactation enhances the growth and cognition of offspring in rats

7.38 - B **Mohammed Dinnunhan, *University of Otago, New Zealand***

Reawakening adult-generated hippocampal granule cells: The effects of enriched environment on an established trend

7.39 - A **Patrick Freymuth, *Massey University, New Zealand***

The actin-binding protein moesin and memory formation in Drosophila

7.40 - B **Nicole Mckay, *University of Auckland, New Zealand***

Brain derived neurotrophic factor genotype modulates recognition memory related event related potentials

7.41 - A **Alison Clare, *University of Otago, New Zealand***

Optimisation of fluorescent activated cell sorting and RNA extraction from dissociated mature mouse cortex tissue for transcriptome profiling

7.42 - B **Madeleine Kyrke-Smith, *University of Otago, New Zealand***

Regulation of HDAC1 and HDAC2 following long-term potentiation

7.43 - A **Eric Rosentreter, *University of Auckland, New Zealand***

In search of behavioural effects correlates of visual long-term potentiation

7.44 - B **Meagan Barclay, *University of Auckland, New Zealand***

Establishing the 3D distribution of synaptic proteins around sensory receptors in the mammalian cochlea during early postnatal development

7.45 - A **Matt Oxner, *University of Auckland, New Zealand***

Steady-state evoked potentials of visual illusory flicker are modulated by concurrent auditory flutter frequency

Poster Session

7.46 - B	**Jody Cicolini, *University of Otago, New Zealand***
	The urea cycle is induced in Alzheimer's brains
7.47 - A	**Masatoshi Yamashita, *Tezukayama University, Japan***
	Role of glial-neuron interactions in central fatigue induced by alteration of tryptophan sensitivity
7.48 - B	**Nirajmohan Shivaperumal, *Victoria University of Wellington, New Zealand***
	Investigating the analgesic properties of a novel mu-opioid receptor analogue of Salvinorin A
7.49 - A	**Jodi Morrissey, *University of Otago, New Zealand***
	Fragments of amyloid precursor protein enhance rat hippocampal LTP
7.50 - B	**Natasha Bukholt, Victoria University of Wellington, New Zealand**
	Self-administration of MDMA produces a sensitised response to the locomotor activating effect of MDMA
4.00 pm	Posters to be removed at this time
8.00 pm	AWCBR Student Dinner Venue: Winnies Gourmet Pizza and Bar, 7-9 The Mall, Queenstown

Monday 31 August
Evening Session

Opening of Queenstown Research Week

Venue: Rydges Hotel, Ben Lomond

6.00 pm	Opening Remarks **Peter Shephard**
6.30 pm	Opening Lecture **Larry Young** ***Emory University, United States of America*** The neural mechanisms of social bonding: Implications for novel therapies for autism Sponsored by the University of Otago
8.00 pm	MedSci and AWCBR Social Mixer Venue: Rydges Hotel
9.00 pm	Queenstown Research Week Chico's Party Venue: Chico's The Mall - Don't forget QRW name badge for entry

Tuesday 1 September
Morning Session

6.00-8.45 am Light Breakfast Available

8. Sensory and Motor Systems (I)

Chair: Tim David

8.45 am	8.1	**Peter Thorne, *University of Auckland, New Zealand*** Measuring inner ear permeability using DCE-MRI in patients with Meniere's disease
9.00 am	8.2	**Simon Schultz, *Imperial College London, United Kingdom*** Encoding of virtual reality locomotion kinematics in the spinocerebellar vermis and lateral cerebellum
9.15 am	8.3	**Marie-Claire Smith, *University of Auckland, New Zealand*** Effects of TMS coil orientation, posture and limb dominance on lower limb motor cortex excitability
9.30 am		Tea/Coffee break

Tuesday 1 September
Morning Session

9. Sensory and Motor Systems (II)

Chair: Ping Liu

9.45 am	9.1	**Susan Tyree,** ***German Institute of Human Nutrition, Germany*** Arc expression in the mouse parabrachial nucleus following taste stimulation
10.00 am	9.2	**Phillip Aitken,** ***University of Otago, New Zealand*** Bilateral vestibular lesions increase sensitivity to non-vestibular induced theta rhythm in rats
10.15 am	9.3	**Rebekah Blakemore,** ***University of Otago, New Zealand*** Emotion-modulated force control: A multidisciplinary approach to investigate freezing reactions in humans
10.30 am	9.4	**Nathan Barlow,** ***University of Auckland, New Zealand*** Auditory attention with cochlear implants: The brief test of attention (Schretlen, 1997) in 2015
10.45 am		**ANNUAL GENERAL MEETING** All conference participants are invited to attend Tea/Coffee will be available for AGM attendees

Tuesday 1 September
Afternoon Session

3.30 pm		Afternoon Tea Available

10. Disorders of the Nervous System (I)

Chair: Debbie Young

4.00 pm	10.1	**Yu Jing, *University of Otago, New Zealand*** Blood arginine metabolic profile is altered in male Sprague-Dawley rats
4.15 pm	10.2	**Andrea Kwakowsky, *University of Auckland, New Zealand*** Impaired GABAA receptor function in Alzheimer's disease
4.30 pm	10.3	**Duyen Pham, *The University of Adelaide, Australia*** Protocadherin 19 (PCDH19) regulates estrogen receptor alpha (ERα)
4.45 pm	10.4	**Kristyn Bates, *The University of Western Australia, Australia*** Astrocytic response to low-intensity repetitive transcranial magnetic stimulation (rTMS)
5.00 pm	10.5	**Aimee Culverhouse, *Victoria University of Wellington, New Zealand*** Exploring the aversive and anxiogenic effects of novel kappa opioid receptor agonists
5.15 pm	10.6	**Nigel Jones, *University of Melbourne, Australia*** SSRI antidepressants accelerate epilepsy development – role for 5-HT2 receptors?
5.30 pm		Tea/Coffee break

Tuesday 1 September
Evening Session

11. Disorders of the Nervous System (II)

Chair: Stephanie Hughes

5.45 pm	11.1	**Barbara Mason,** ***The Scripps Research Institute, United States of America*** A proof-of-concept human laboratory study of glucocorticoid receptor antagonism as a novel treatment for alcohol dependence
6.00 pm	11.2	**Stella Cameron,** ***University of Otago, New Zealand*** Pathophysiology of the cerebellothalamic pathway in a chronic rat model of Parkinson's disease
6.15 pm	11.3	**Katharina Russell,** ***Lincoln University, New Zealand*** Improving longitudinal biomarkers of ovine batten disease: Neuroimaging and ventricular enlargement in sheep
6.30 pm	11.4	**Jennifer Robertson,** ***Australian National University, Australia*** Sniffing out the mechanism of seizure generalisation through the piriform cortex
6.45 pm	11.5	**Brian Thomas,** ***RTI International, United States of America*** Synthetic cannabinoids: Unique formulations, chemical exposures and pharmacological consequences
7.00 pm	11.6	**Kelly Paton,** ***Victoria University of Wellington, New Zealand*** Analgesic and anti-inflammatory effects of the bioactive lipid Docosahexaenoyl Ethanolamide (DHEA) in pre-clinical behavioural models of pain

Wednesday 2 September
Combined Day with MedSci

6.00-9.00 am Light Breakfast Available

Joint Session with MedSci

Plenary Lecture

Venue: Rydges

9.00 am	**PLENARY LECTURE:** **Ed Callaway, *Salk Institute, United States of America*** Deciphering brain connectivity and function with rabies virus and light
10.00 am	Tea/Coffee break

Wednesday 2 September
Combined Day with QMB

12. Joint Session with QMB
Molecular Approaches to Modern Neuroscience

Venue: Rydges

Chair: Brian Hyland

10.30 am	12.1	**Bronwen Connor, *University of Auckland, New Zealand*** Direct reprogramming to model neurological disease
10.55 am	12.2	**Helen Fitzsimons, *Massey University, Palmerston North, New Zealand*** HDAC4 and memory formation: Interaction with the actin cytoskeleton
11.20 am	12.3	**Christine Jasoni, *University of Otago, New Zealand*** Understanding how maternal obesity and fetal neuro-immune interactions modulate epigenetic regulation of neural development in the mouse
11.45 pm	12.4	**Andrew Hill, *La Trobe University, Australia*** The role of extracellular vesicles in the spread of misfolded proteins associated with neurodegenerative diseases

12.30 pm Closing Remarks

Light lunch and Student Prize Presentation - rydges

Acknowledgements
We are deeply indebted to Norma Bartlett, Department of Psychology, University of Otago for her help with the conference programme and secretarial assistance, and also Cara Duffy, and Hadyn Youens, Department of Psychology, University of Otago, for their help with the AWCBR website. Special thanks to Angela Armstrong, University of Canterbury, High Performance Computing, for her work on the programme. We are very grateful to the Neurological Foundation of New Zealand for its generous financial assistance toward student travel and registration.