

# 37TH INTERNATIONAL CONFERENCE



## **AWCBR**

Australasian Winter Conference  
on Brain Research

## 2019 Programme and Abstracts

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31 August to 4 September 2019  
Crowne Plaza Hotel, Queenstown, New Zealand  
[www.otago.ac.nz/awcbr](http://www.otago.ac.nz/awcbr)



# SATURDAY 31 AUGUST



- 3.00-5.15 PM REGISTRATION, CROWNE PLAZA HOTEL
- 5.30 PM STUDENT MEET AND GREET
- 6.00 PM OPENING RECEPTION, CASH BAR AND LIGHT FOOD
- 7.00 PM OPENING REMARKS

7.15 PM **1. PLENARY LECTURE:**

CHAIR: CLIFF ABRAHAM

**Gal Richter-Levin, *University of Haifa, Israel***

Stress vulnerability, stress resilience and PTSD

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**2. COGNITION AND BEHAVIOUR**

CHAIR: GINA FORSTER

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- 8.00 pm 2.1 **Blake Porter, *University of Otago, New Zealand***  
Mind over matter: The Anterior cingulate cortex's role in driving action towards difficult but worthwhile goals
- 8.15 pm 2.2 **Sophie Barnett, *University of Canterbury, New Zealand***  
Optogenetic stimulation of the anterior thalamic nuclei ameliorates impaired spatial memory in rats with mammillothalamic tract lesions
- 8.30 pm 2.3 **Rachael Sumner, *University of Auckland, New Zealand***  
Neuroplasticity is enhanced by ketamine in patients with major depression
- 8.45 pm 2.4 **Rachel Fiskens, *University of Otago, New Zealand***  
Discrimination difficulty, cognitive burden, and reversal impairments in a maternal immune activation model of schizophrenia risk
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# SUNDAY 1 SEPTEMBER MORNING SESSION

7.00-7.45 AM

LIGHT BREAKFAST AVAILABLE

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## 3. PLENARY LECTURE:

CHAIR: NEIL MCNAUGHTON

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8.00 am

**Dean Mobbs, *California Institute of Technology, United States of America***

Space, time and fear: Survival decisions along defensive circuits

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## 4. SYMPOSIA:

### NEUROSCIENCE OF FEAR AND ANXIETY

CHAIR: NEIL MCNAUGHTON

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8.45 am

4.1

**Matthew Hale, *La Trobe University, Australia***

Understanding the behavioural, molecular and neuronal-network effects of SSRI antidepressant drugs

9.00 am

4.2

**Brian Cornwell, *Swinburne University of Technology, Australia***

Cortical mechanisms of impaired cognitive control in anxiety

9.15 am

4.3

**Neil McNaughton, *University of Otago, New Zealand***

From rat to human to rat: A parallel-circuit homology-based model of anxiety, goal conflict, and stopping

9.30 am

4.4

**Gina Forster, *University of Otago, New Zealand***

Neuropeptide modulation of anxiety neurocircuitry and behaviour

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# SUNDAY 1 SEPTEMBER MORNING SESSION



9.45 am Tea/Coffee break

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## 5. NOVEL METHODS AND INTEGRATIVE SYSTEMS

CHAIR: KYLA-LOUISE HORNE

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- 10.00 am 5.1 **Philip Ryan, *University of Melbourne, Australia***  
The parabrachial nucleus regulates initial intake of ethanol, sucrose and other solutions
- 10.15 am 5.2 **Jayde Lockyer, *University of Tasmania, Australia***  
Development of novel optogenetic approaches to manipulate neuronal GPCR signalling
- 10.30 am 5.3 **Allanah Kenny, *University of Canterbury, New Zealand***  
A balance of power: Neurovascular coupling, the influence of NO, 20-HETE, GABA and NPY
- 10.45 am 5.4 **Denise Taylor, *Auckland University of Technology, New Zealand***  
Movement-related cortical potentials paired with peripheral electrical stimulation improves voluntary activation in people with stroke
- 11.00 am 5.5 **Gonzalo Maso Talou, *University of Auckland, New Zealand***  
Adaptive constrained constructive optimisation for complex vascularisation processes in brain cortex
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## SUNDAY 1 SEPTEMBER AFTERNOON SESSION

3.30-3.45 PM

AFTERNOON TEA AVAILABLE

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### 6. SENSORY AND MOTOR SYSTEMS

CHAIR: YIWEN ZHANG

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|---------|-----|--|
| 3.45 pm | 6.1 | <b>Haruna Suzuki-Kerr, <i>University of Auckland, New Zealand</i></b><br>Improving drug delivery to the inner ear using the sheep round window membrane as a model               |
| 4.00 pm | 6.2 | <b>Javier Jimenez-Martin, <i>University of Otago, New Zealand</i></b><br>Visualising population voltage responses of cortical layer 2/3 during sensory stimulation in awake mice |
| 4.15 pm | 6.3 | <b>Pablo Ortega-auriol, <i>University of Auckland, New Zealand</i></b><br>Functional connectivity of muscle synergies  |
| 4.30 pm | 6.4 | <b>Manju Ganesh, <i>University of Otago, New Zealand</i></b><br>Deciphering the fate of integrated pericytes in mouse motor cortex   |

At Rydges with Hypothalamic Neuroscience and Neuroendocrinology Australasia (HNNA)

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### 7. PLENARY LECTURE:

CHAIR: KARL IREMONGER

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| 5.00 pm |  | <b>Zachary Knight, <i>University of California, San Francisco, United States of America</i></b><br>The neurobiology of homeostasis |
|---------|--|--|
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SUNDAY 1 SEPTEMBER



## *Conference Dinner*

*7.30 pm*

### *Skyline Restaurant*

Tickets must be purchased in advance.  
The ticket includes return gondola 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 2 SEPTEMBER MORNING SESSION

8.00-8.45 AM

LIGHT BREAKFAST AVAILABLE

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## 8. SYMPOSIA: BRAIN PLASTICITY – FROM NEUROGENESIS TO CELL REMODELLING CHAIR: MAURICE CURTIS

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|----------|-----|---|
| 9.00 am  | 8.1 | <b>Helen Murray, <i>University of Auckland, New Zealand</i></b><br>PSA-NCAM mediated plasticity is reduced in the human Alzheimer's disease entorhinal cortex                           |
| 9.15 am  | 8.2 | <b>Maurice Curtis, <i>University of Auckland, New Zealand</i></b><br>Regulation of plasticity through PSA-NCAM in development and adulthood   |
| 9.30 am  | 8.3 | <b>Dhanisha Jhaveri, <i>University of Queensland, Australia</i></b><br>Targeting adult-born neurons to regulate neural circuitry and anxiety-related behaviour                          |
| 9.45 am  | 8.4 | <b>Lachlan Thompson, <i>Florey Institute for Neuroscience and Mental Health, Australia</i></b><br>Can injury stimulate striatal neurogenesis in the postnatal brain?                    |
| 10.00 am | 8.5 | <b>Michael Kaplan, <i>Waikato Hospital, New Zealand</i></b><br>Neuroplasticity delayed acceptance: Controversial issues in the late 1970s in contrast to contemporary clinical practice |
| 10.15 am |     | Tea/Coffee break  |
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9. DISORDERS OF THE NERVOUS SYSTEM

CHAIR: ANDREA KWAKOWSKY

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- 10.30 am 9.1 **Yiwen Zheng, *University of Otago, New Zealand***  
Increased synaptic plasticity in the inferior colliculus of rats following acoustic trauma
- 10.45 am 9.2 **Mohamed Ibrahim, *University of Otago, New Zealand***  
Metabotropic Glutamate Receptors as a potential therapeutic target for the treatment of Spino-cerebellar Ataxia Type 1 (SCA1)
- 11.00 am 9.3 **Chin-Hsiao Tseng, *National Taiwan University College of Medicine, Taiwan***  
Vildagliptin and dementia risk in type 2 diabetes patients
- 11.15 am 9.4 **Pranav Vemula, *University of Otago, New Zealand***  
Altered brain arginine metabolism with age in the APP<sup>swe</sup>/PSEN1<sup>dE9</sup> mouse model of Alzheimer's disease
- 11.30 am 9.5 **Molly Swanson, *University of Auckland, New Zealand***  
Immunophenotype marker changes demonstrate microglial dysfunction in the human Alzheimer's disease middle temporal gyrus
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## POSTER SESSION

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### 10. POSTER SESSION

NB: CROWNE PLAZA 1

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- 2.00 - 5.45pm      Presenters for session A should put up their posters by 2.30 pm and be in attendance from 2.30-4.00 pm.  
Presenters for session B should put up their posters at 4.00 pm and be in attendance from 4.15-5.45 pm.  
Poster board numbers shown in brackets.
- 10.1 (A1)      **Corey Wadsley, *University of Auckland, New Zealand***  
Between-hand coupling during response inhibition
- 10.2 (A2)      **Micah Austria, *University of Auckland, New Zealand***  
Neurovascular unit characterization in the Alzheimer's disease middle temporal gyrus using human brain tissue microarrays
- 10.3 (A3)      **Chia-Liang Tsai, *National Cheng Kung University, Taiwan***  
Event-related neural oscillations in individuals with a family history of Alzheimer's disease and ApoE-4 genotype
- 10.4 (A4)      **Sivaporn Tasananukorn, *University of Canterbury, New Zealand***  
Immediate early gene Zif268 response is reduced in the extended hippocampal system by senescence, but partially improved by oral administration of a connexin hemichannel blocker
- 10.5 (A5)      **Shaojie Zheng, *University of Otago, New Zealand***  
Investigating the mechanisms driving circadian and sex differences in the stress axis
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# POSTER SESSION



- 10.6 (A6) **Eric Williams, *University of Canterbury, New Zealand***  
Language changes in Alzheimer's disease: A systematic review of verb processing
- 10.7 (A7) **Jo Chapman, *Massey University, New Zealand***  
A new test design for IFOF mapping during awake craniotomy
- 10.8 (A8) **Susannah Lumsden, *University of Otago, New Zealand***  
Neuromodulation of the pineal gland
- 10.9 (A9) **Joshua Houlton, *University of Otago, New Zealand***  
Stroke-induced impairment in spatial working memory on the trial unique nonmatched-to-location task
- 10.10 (A10) **Eloise Croy, *University of Otago, New Zealand***  
Dysfunction in the anterior cingulate cortex and the ventral tegmental area in relation to decision making and motivation in an animal model of schizophrenia
- 10.11 (A11) **Ashim Maharjan, *University of Otago, New Zealand***  
Neuromodulation of olfactory performances using high-frequency vagus and median nerve stimulation in healthy-male, adults
- 10.12 (A12) **Emma Deeney, *University of Otago, New Zealand***  
Climbing fibre abnormalities are accompanied by elevated BDNF expression in a mouse model of SCA1
- 10.13 (A13) **Blake Hight, *University of Auckland, New Zealand***  
Dual in situ hybridization and immunohistochemistry for quantitative analysis of house-keeping gene changes in normal and Alzheimer's disease brain tissue
- 10.14 (A14) **Jiaixan Zhang, *University of Otago, New Zealand***  
Maternal immune activation alters pre-pulse inhibition and hippocampal nitric oxide synthase in postnatal day 35 and 60 rat offspring



## POSTER SESSION

- 10.15 (A15)      **Yuan-Duo Zhu, *Anhui Medical University, China***  
Behavioural deficits and hippocampal apoptosis in offspring with prenatal Di-(2-ethylhexyl) phthalate exposure
- 10.16 (A16)      **Ding-Cheng Peng, *University of Auckland, New Zealand***  
I trust you, my imagined friend
- Tea/coffee break (4.00-4.15 pm) and poster change over
- 10.17 (B1)      **Kunling Li, *University of Otago, New Zealand***  
Local field potential recordings in rat anterior cingulate cortex, anterior insula, and ventral tegmental area during a voluntary effort exertion task
- 10.18 (B2)      **Amy Alder, *Victoria University of Wellington, New Zealand***  
Evaluating the potential of G protein biased Mu Opioid Receptor agonists as a treatment for chronic pain
- 10.19 (B3)      **Prashanna Khwaounjoo, *University of Otago, New Zealand***  
Non-contact volumetric displacement and frequency spectrum analysis for Parkinson disease tremor assessment
- 10.20 (B4)      **Doreen Hansmann, *University of Canterbury, New Zealand***  
Picture naming in 3-year-old children: Evaluation of an experimental protocol for EEG recording
- 10.21 (B5)      **Phoebe Anscombe, *University of Auckland, New Zealand***  
Cerebrovascular expression of GABAergic signalling components in the hippocampus of healthy and Alzheimer's disease brains
- 10.22 (B6)      **Sara Ahmed, *University of Otago, New Zealand***  
Partial eNOS deficiency promotes cognitive impairment in a murine model of Alzheimer's disease

## POSTER SESSION



- 10.23 (B7) **Eddie Barnett, *University of Otago, New Zealand***  
Assessing the impact of comorbidities on axonal sprouting after stroke to the motor cortex
- 10.24 (B8) **Kendra Boyes, *Victoria University of Wellington, New Zealand***  
Evaluation of locomotor and pain behaviours in the cuprizone toxin-induced demyelination model of multiple sclerosis
- 10.25 (B9) **Bhavya Chawdhary, *University of Auckland, New Zealand***  
Miniaturized wireless optoelectronic subdermal implants: A novel device for the optogenetic stimulation of hippocampal neurons
- 10.26 (B10) **Emily Golden, *University of Otago, New Zealand***  
Establishing an animal model of pediatric mild traumatic brain injury
- 10.27 (B11) **Emma Gowing, *University of Otago, New Zealand***  
The gliopeptide, ODN, regulates tonic GABAA receptor currents and boosts functional recovery after stroke
- 10.28 (B12) **Seunga Han, *University of Auckland, New Zealand***  
3-dimensional structural analysis of the sheep round window membrane
- 10.29 (B13) **Jordan Lloyd, *University of Auckland, New Zealand***  
Changes in dopamine signaling and responses to drugs affecting dopaminergic neurotransmission in striatal and ventral midbrain slices from DAT-KO rats
- 10.30 (B14) **Caitlin McElligott, *University of Canterbury, New Zealand***  
The relationship between cognitive function and expressive language in individuals with Parkinson's disease
- 10.31 (B15) **Munaza Ramzan, *Jaypee Institute of Information Technology, India***  
Analyzing emotional brain functional connectivity networks using electroencephalography signals



## POSTER SESSION

- 10.32 (B16)      **Sajida Malik, *RMIT University, Australia***  
Neuroimmune interactions in the ageing brain
- 10.33 (B17)      **Shane Ohline, *University of Otago, New Zealand***  
Stimulation of neurogenesis by a potential therapeutic protein
- 10.34 (B18)      **Madelaine Williams, *University of Otago, New Zealand***  
Levels of activity-dependent effects of Li<sup>+</sup> on mitral cell activity
- 5.45 pm              Posters to be removed at this time

# MONDAY 2 SEPTEMBER EVENING SESSION



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## 11. OPENING OF QUEENSTOWN RESEARCH WEEK

Venue: Rydges Hotel

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6.00 pm                    OPENING ADDRESS

**PETER SHEPHERD**

6.15 pm                    QRW PLENARY LECTURER

**JOAN STEITZ**

7.00 pm                    QRW SOCIAL

8.00 pm                    AWCBR STUDENT DINNER  
Venue: Smiths Craft Beer House

ANS Sponsored Student Quiz

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## TUESDAY 3 SEPTEMBER MORNING SESSION

7.00-7.45 AM

LIGHT BREAKFAST AVAILABLE

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### 12. PLENARY LECTURE:

CHAIR: RUTH EMPSON

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8.00 am

**David Spanswick, Monash University, Australia**

Energy status-dependent functional plasticity of the hypothalamic melanocortin system: Focus on glucose and ghrelin

Sponsored by Symbiotic Devices Pty Ltd

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### 13. SYMPOSIA:

**PAIN - PERCEPTION, MODELS, MECHANISMS,  
NOVEL TREATMENTS AND HUMAN COST**

CHAIR: RUTH EMPSON

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8.45 am

13.1

**Bronwyn Kivell, Victoria University of Wellington, New Zealand**

Do drugs targeting the kappa opioid receptor hold the key to finding effective treatments for neuropathic pain?

9.00 am

13.2

**Wendy Imlach, Monash University, Australia**

Targeting spinal adenosine signalling to treat neuropathic pain

9.15 am

13.3

**Ruth Empson, University of Otago, New Zealand**

Voltage maps from somatosensory cortex in awake behaving mice – use for mapping chronic pain transition in the brain

9.30 am

13.4

**David Spanswick, Monash University, Australia**

New therapeutic approaches for neuropathic pain

9.45 am

Tea/Coffee break

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# TUESDAY 3 SEPTEMBER MORNING SESSION



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## 14. INFOBLITZ

CHAIR: PING LIU

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| 10.00 am | 14.1 | <b>Narun Pornpattananangkul, <i>University of Otago, New Zealand</i></b><br>Large-scale brain network analysis of anhedonia in youth: phenotypic demarcation and context specificity |
| 10.05 am | 14.2 | <b>Eileen Luders, <i>University of Auckland, New Zealand</i></b><br>Increased local gray matter in the maternal brain at 4-6 weeks after childbirth                                  |
| 10.10 am | 14.3 | <b>Florian Kurth, <i>University of Auckland, New Zealand</i></b><br>Development of sex differences in brain structure characterized using machine learning                           |
| 10.15 am | 14.4 | <b>Usman Ghani, <i>Auckland University of Technology, New Zealand</i></b><br>EEG correlates of task difficulty: Development of an objective measure of cognitive workload            |
| 10.20 am | 14.5 | <b>Nikita Lyons, <i>University of Auckland, New Zealand</i></b><br>Effects of blueberry-derived phenolic acid metabolites on neuronal mitochondria degradation                       |
| 10.40 am |      | <b>ANNUAL GENERAL MEETING</b><br>All conference participants are invited to attend<br>Tea/Coffee will be available for AGM attendees   |
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## TUESDAY 3 SEPTEMBER AFTERNOON SESSION

3.45-4.00 PM

AFTERNOON TEA AVAILABLE

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### 15. SYMPOSIA: PSYCHONEUROIMMUNOLOGY ACROSS THE LIFESPAN

CHAIR: SARAH SPENCER

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- 4.00 pm    15.1    **Atsuyoshi Shimada, *Kyorin University, Japan***  
Histological architecture underlying brain-immune cell-cell interactions
- 4.15 pm    15.2    **Luba Sominsky, *RMIT University, Australia***  
Early-life immune activation and suppression similarly disrupt  
neuroendocrine development and function long-term
- 4.30 pm    15.3    **Suzi Hong, *University of California, San Diego, United States of America***  
CNS to Immune and Back: Neuroendocrine regulatory pathways of  
inflammation underlying neuropsychopathology
- 4.45 pm    15.4    **Sarah Spencer, *RMIT University, Australia***  
Neuroimmune interactions in the ageing brain
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## 16. COGNITION AND BEHAVIOUR

CHAIR: TRACY MELZER

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- 5.00 pm    16.1    **Wayne Meighan, *University of Otago, New Zealand***  
Maternal immune activation in rats produces a subjective internal state that is analogous to human psychosis
- 5.15 pm    16.2    **Kyla-Louise Horne, *University of Otago, New Zealand***  
MRI-Derived estimated brain-age and cognitive decline in Parkinson's disease
- 5.30 pm    16.3    **Grace Wang, *Auckland University of Technology, New Zealand***  
The link between mindfulness, immune function and memory
- 5.45 pm    16.4    **Nitika Kumari, *Auckland University of Technology, New Zealand***  
Can cerebellar transcranial direct current stimulation influence motor learning in healthy adults?
- 6.00 pm    16.5    **Joanne Lin, *University of Auckland, New Zealand***  
Evidence of widespread metabolite abnormalities in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: Assessment with whole-brain magnetic resonance spectroscopy
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## WEDNESDAY 4 SEPTEMBER MORNING SESSION

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9.00 AM

### 17. MEDSCI PLENARY LECTURE (RYDGES)

**Professor Rosalind John**

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### 18. SYMPOSIA @ THE RYDGES WITH MEDSCI: HOMEOSTATIC CIRCUITS

CHAIR: KARL IREMONGER

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|----------|------|---|
| 10.30 am | 18.1 | <b>Stephanie Padilla, <i>University of Massachusetts, United States of America</i></b><br>Kiss1 neurons in the arcuate nucleus of the hypothalamus are a hub for metabolic, temperature and neuroendocrine outcomes |
| 11.00 am | 18.2 | <b>Zane Andrews, <i>Monash University, Australia</i></b><br>Hunger-sensing Agrp neurons link metabolic and motivational states  |
| 11.30 am | 18.3 | <b>Stuart McDougall, <i>Florey Institute of Neuroscience and Mental Health, Australia</i></b><br>Synaptic modulation of viscerosensory signals within the brainstem   |
| 12.00 pm | 18.4 | <b>Joon Kim, <i>University of Otago, New Zealand</i></b><br>Stress experience and hormone feedback tune distinct components of hypothalamic CRH neuron activity   |
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# WEDNESDAY 4 SEPTEMBER MORNING SESSION



12.30 pm                      CLOSING REMARKS AND STUDENT PRIZE PRESENTATION  
  
   LIGHT LUNCH REDS BAR, LEVEL 6, RYDGES

***Acknowledgements***

We are deeply indebted to Norma Bartlett, Department of Psychology, University of Otago for her help with the conference programme, secretarial assistance, and also Hadyn Youens, Department of Psychology, University of Otago, for help with the abstract submission. We are very grateful to the Neurological Foundation of New Zealand for its generous financial assistance toward student travel and registration.