

# NEURONS, SYNAPSES & CIRCUITS: FROM FUNCTION TO DISEASE

## Meeting report

From August 16-18 2018, the conference *Neurons, synapses and circuits: from function to disease* was held at Q Station, a heritage-listed former quarantine station, and current hotel, located in a national park in Sydney, Australia. Several attendees commented on the outstanding location chosen for the conference, a tranquil, scenic locale in bushland with views over the bay towards the Sydney skyline. The meeting was co-organized by Professor Pankaj Sah of the Queensland Brain Institute, Dr Katherine Roche of the National Institutes of Health, Dr David Bredt from Janssen Pharmaceutica, and Professor Shengtao Hou from the Southern University of Science and Technology in Shenzhen, China.

Including the invited speakers, of which there were 24, a total of 92 registrants attended the meeting. Registration cost \$200 (Australian dollars), a fee that was frequently referred to by attendees as extremely generous and which entitled participants to 2x buffet lunches, a \$75/head conference dinner, and morning and afternoon tea and snacks for two days. A total of 68 paying registrants (speaker registration fees were waived) meant we recouped \$13,600 in registration fees (see Appendix 1 for list of participants). A breakdown of registrants by position showed that 25 students, 24 postdoctoral researchers and 19 senior investigators attended. This is in addition to the 24 invited speakers, all of whom head their own laboratories as senior investigators. Thus the main beneficiaries of this event were local student and postdoctoral researchers. Thirty-six of the paying registrants submitted an abstract for presentation, and four of these were selected for short-talks on the 3<sup>rd</sup> day of the program.

The program (see Appendix 2) began on the evening of Thursday August 16 with a plenary lecture given by Rick Huganir of Johns Hopkins University. He discussed the movement of synaptic proteins within excitatory synapses, showing that some remain stable for long periods whereas others are regularly recycled. The concept of long-term stability for some synaptic proteins is a novel and intriguing finding that could have significant consequences for our understanding of synaptic plasticity and the development of therapeutics. Professor Huganir's lecture was followed by a brief social mixer to welcome attendees to the conference.

In the first session on Friday, David Bredt, from Janssen, presented data concerning mechanisms for regulating the assembly and function of nicotinic acetylcholine receptors. He showed that the chaperone NACHO is essential *in vivo* for multiple classes of nACh receptors. Whereas NACHO alone can mediate assembly and surface expression of  $\alpha 7$  and  $\alpha 4\beta 2$  receptors, additional neuronal factors are required for  $\alpha 6\beta 2\beta 3$  receptors.

Rob Malenka from Stanford University presented work on the neural circuit mechanisms underlying positive prosocial interactions, or sociability. He reported that in a mouse model of a relatively common genetic cause of autism spectrum disorders, deficits in social interactions could be explained by dysfunction of serotonergic (5-HT) neurons in the dorsal raphe nucleus. Furthermore, this deficit could be rescued by optogenetic activation of dorsal raphe 5-HT neurons, an effect that

required activation of 5-HT<sub>1b</sub> receptors in the NAc. This indicates a surprisingly robust role for 5-HT release in the NAc in social behaviors and suggests a possible therapeutic target.

Bernardo Sabatini from Harvard University presented data showing that signals in the mouse basal ganglia encode the action the mouse is currently performing. These studies were facilitated by a machine learning approach that allowed continuous analysis of mouse behavior and the identification of repeated “syllables” within the behavior. He further demonstrated that basal ganglia lesions perturb the sequencing of behaviors, consistent with a role for the basal ganglia in generating such sequenced behavior.

Sabatini’s talk was followed by some down-time for attendees, who could explore the site or take the short trip to Manly’s beachfront. A couple of hours later, a poster session was held to allow early career researchers to present and discuss their work with their peers, including the stellar line up of national and international speakers at the event. A conference dinner followed this, allowing some a chance for attendees to socialise and discuss their work in a more informal environment.

The next day (Saturday), the series of talks from our invited speakers continued. Katherine Roche from the NIH presented recent findings from her group showing that a rare variant of Grin2B (S1415L) identified in an autism patient results in a missense mutation in the C-terminal domain of GluN2B, and has a variety of effects on receptor trafficking and synaptic function. This mutation decreased binding of scaffolding proteins, decreased NMDA receptor surface expression, and decreased spine density compared to wild-type GluN2B. In a knock-in mouse with the mutation (S1413L, in mouse) generated by her lab, Dr Roche found region-specific deficits in the synaptic enrichment of NMDA receptors *in vivo*.

Diane Lipscombe from Brown University gave the meeting’s second plenary lecture, in which she discussed the cell-type specificity of voltage-gated calcium channel splice isoforms. She described alternative splicing in nociceptors as compared to other neurons, further showing that the splicing event impacts the way in which G proteins couple to and regulate calcium ion channel activity. This had the effect of making morphine a more effective inhibitor of the CaV2.2 calcium channel, as compared to its effects in non-nociceptive neurons. She also described the molecular mechanisms controlling the exon composition of calcium channels in nociceptors.

Lipscombe’s talk was followed by four short talks selected from abstracts that were submitted to the conference. These included Jianyuan Sun’s provocative data on sub-quantal variation in transmitter release, Bryony Winters’ talk on opioid-mediated disinhibition of a descending analgesic pathway, Brian Billups’ talk on the involvement of presynaptic glutamine transporters in glutamatergic transmission, and Tristan Wallis’ description of region-specific changes in free fatty acids during fear learning.

In the final session, Greg Stuart talked about the cellular and circuit mechanisms underlying the processing of binocular visual information in primary visual cortex (V1). He showed results suggesting that visual input from the ipsilateral eye to binocular V1 also has a significant projection to contralateral V1. The neurons in contralateral V1 that receive binocular input appear to represent a distinct population with different active electrical properties. His results gave insight into the cortical mechanisms for processing binocular visual information.

Marta Garrido from The University of Queensland discussed the presence of a non-cortical pathway for conveying visual information, from the superior colliculus to the amygdala via the pulvinar. Identification of the pathway was reproduced in a large-scale sample using the Human Connectome Project database, and shown to have a functional role in fear recognition: a denser pathway

correlating with more accurate judgment of fear in faces, in patients with lesioned visual cortices that do not have conscious visual percepts.

The conference closed on Saturday evening with broad consensus that the meeting was excellent both from a scientific and social/collaborative perspective. A full list of invited speakers is given in Appendix 3.

Two meeting highlights come to mind. Dr Haganir's data on the turnover of synaptic proteins at excitatory synapses was unexpected and exciting, as he revealed differing stability levels for different proteins: whereas some are recycled regularly, others appear much more stable. This is a potentially paradigm-shifting result. Second, Dr McBain presented data comparing the properties of mossy fiber synapses between animals and humans. Such a detailed comparison was the first to be conducted at a well-characterised synapse, and a range of similarities and differences was revealed. This type of data is essential for the creation of rationally targeted therapies for neurological disorders.

Advertising for the conference was primarily within Australia and New Zealand. Links to the [conference website](#) and pdfs of the flyer were sent to researchers from known neuroscience departments, who were asked to distribute within their institutes/departments. Once on-site, registrants were offered copies of the [conference program booklet](#).

We were fortunate to attract several sponsors for this event, presumably in recognition of the calibre of the program. In addition to the generous sponsorship from the International Society for Neurochemistry, support was provided by Janssen Pharmaceutica, Australia's Centre for Integrative Brain Function, the Queensland Brain Institute, Genentech, Zeiss, Coherent Scientific, and BioLegend. The total value of sponsorship received was ~\$48,000 AUD (see budget in Appendix 4). In return for their support, sponsors' names and/or logos were present on all conference materials (website, program booklet, flyer), and BioLegend were able to set up an on-site stand for their wares. We are extremely grateful to all of our sponsors for making the meeting possible.

The sponsorship was used to help cover travel and accommodation costs of the invited speakers, to keep registration fees low to encourage attendance of early career researchers (who made up the bulk of registrants), and to help in securing the excellent conference venue. Accommodation on-site at Q Station was fully covered for all speakers, \$2000 AUD was allocated for international speaker travel, and travel for domestic speakers was fully covered.

## Testimonials from attendees

**Helena Huang – Postdoctoral Research Fellow, The Australian National University:** *"I very much enjoyed attending the Manly conference. As a sensory neuroscientist interested in circuit functions, a meeting like this one was a rare gem. I think it was organised particularly well and brought together a unique set of people. I gave a poster presentation at this meeting and found it to be a good opportunity for scientific discussions and thinking about potential collaborations/career moves. In this regard, I also rather liked the fact that the meeting was small enough for me to remember people's names and have more in-depth chats. It goes without saying the speakers were of a very high caliber and gave interesting talks. I especially enjoyed Liping Wang's talk on innate fear and Bernardo Sabatini's talk on the neural basis of locomotion motifs. Overall the general atmosphere was friendly and relaxed, the venue was beautiful and I found it to be a particularly useful experience."*

**Frederic Meunier – Professor, The University of Queensland:** *"The conference and location at the Q Station were great. The line-up of speakers was outstanding. What most impressed me was the*

*demonstration by Rick Huganir that a few proteins remain constant in synapses. I think this is potentially a game changer in the field.”*

**Bharat Venkatesh – PhD student, The University of Queensland:** *“The level of expertise and knowledge of the presenters were excellent and I immensely benefited from their knowledge in different areas of neuroscience and their talks. In addition, I appreciated their positive attitudes, willingness to explain concepts, clarity of visual aids, and the opportunities to ask questions. The insights I have gained from this conference make it one of the best that I have attended to date. Wonderful, insightful and well presented!”*

**Miriam Matamales – Postdoctoral Research Fellow, University of New South Wales:** *“I am really glad I was able to attend the Neurons, synapses & circuits – from function to disease conference that took place on August 16-18, 2018 at the Q-station (Sydney). The program was particularly relevant to my current work on the basal ganglia and movement disorders and I was impressed with the presentations of some world-recognised researchers on that topic, both from Australia and overseas. Not only animal studies, but also the conference included some talks from renowned clinical researchers undertaking research that reveals the neural activity in the brain of Parkinson’s disease and Tourette syndrome patients. Overall, the Neurons, synapses & circuits – from function to disease conference truly offered a range of innovative sessions with outstanding speakers as well as lots of opportunities to meet new people and exchange ideas.”*

**Robert Malenka – Nancy Fried Pritzker Professor, Stanford University:** *“The recent meeting near Sydney was a valuable experience. The speakers uniformly were excellent and gave highly informative talks, and many different topics were covered in a manner that made the research findings accessible to all audience members. Everybody with whom I interacted was friendly and collegial. I had many fun and productive conversations and anticipate that a new research collaboration will happen as a consequence of my attendance at the meeting. The venue was very nice---a beautiful location. My only complaint is that it was a bit cold the night of the conference dinner making it uncomfortable to hang out outside.”*

## Appendix 1 – List of participants

FIRST NAME	LAST NAME	ORGANISATION	POSITION
Victor	Anggono	The University of Queensland	Senior Investigator
Ehsan	Arabzadeh	The Australian National University	Senior Investigator
Karin	Aubrey	Pain Management Research Institute, Kolling Institute and University of Sydney	Senior Investigator
Elena	Bagley	University of Sydney	Senior Investigator
Bernardo	Balleine	University of New South Wales	Senior Investigator
Jay	Bertran- Gonzalez	University of New South Wales	Postdoctoral Researcher
Madhusoothanan	Bhagavathi Perumal	Queensland Brain Institute	Postdoctoral Researcher
Brian	Billups	Australian National University	Senior Investigator
Laura	Bradfield	University of Technology Sydney	Postdoctoral Researcher
David	Bredt	Janssen Pharmaceutica	Senior Investigator
Robyn	Brown	Florey Institute of Neuroscience and Mental Health	Senior Investigator
Thomas	Burton	The University of Sydney	PhD student
Michael Lawrence	Castanares	Australian National University	PhD student
Jessica	Chedid	Lebanese university	PhD student
Xiumin	Chen	Queensland Brain Institute	PhD student
Elizabeth	Coulson	The University of Queensland	Senior Investigator
Linda	Dansereau	Stanford University	Postdoctoral Researcher
Vincent	Daria	Australian National University	Senior Investigator
Mike	Dragunow	The University of Auckland	Senior Investigator
Kristen	Farrell	The Australian National University	Postdoctoral Researcher
Thomas	Fath	Macquarie University	Senior Investigator
Marta	Garrido	The University of Queensland	Senior Investigator
Saba	Gharaei	Australian National University	Postdoctoral Researcher
Helen	Gooch	Queensland Brain Institute	Postdoctoral Researcher
Geoffrey	Goodhill	The University of Queensland	Senior Investigator
Sarah	Gordon	Florey Institute of Neuroscience and Mental Health	Senior Investigator
Gabi	Gregoriou	University of Sydney	PhD Student
Andrew	Gundlach	The Florey Institute of Neuroscience and Mental Health	Senior Investigator
Robertas	Guzulaitis	The Florey Institute of Neuroscience and Mental Health	Postdoctoral Researcher
Emily	Harrison	The University of Sydney	PhD Student
Edward	Hawrot	Brown University	Senior Investigator
Nathan	Holmes	University of New South Wales	Postdoctoral Researcher
Suraj	Honnuraiah	ANU	PhD student
Anna	Horton	The Florey Institute of Neuroscience & Mental Health	PhD student
Shengtao	Hou	Southern University of Science and Technology	Senior Investigator

Helena	Huang	Eccles Institute of Neuroscience, JCSMR, ANU	Postdoctoral Researcher
Richard	Huganir	Johns Hopkins University	Senior Investigator
Marcel	Julliard	Macquarie University	PhD student
Julie	Kauer	Brown University	Senior Investigator
Ryan	Keable	University of New South Wales	Honours student
Janet	Keast	The University of Melbourne	Senior Investigator
Angelo	Keramidas	University of Queensland	Postdoctoral Researcher
Ehsan	Kheradpezhoh	The Australian National University	Senior Investigator
Sarah	Kissiwa	University of Sydney	PhD student
Anatol	Kreitzer	UCSF	Senior Investigator
Jessica	Leake	The University of Technology Sydney	PhD student
Conrad	Lee	Australian National University	PhD student
Dana	Leidl	UNSW Psychology	PhD student
Iryna	Leshchyns'ka	University of New South Wales	Postdoctoral Researcher
Diane	Lipscombe	Brown University	Senior Investigator
E. Javier	Lopez Soto	Brown University	Postdoctoral Researcher
Robert	Malenka	Stanford University	Senior Investigator
Roger	Marek	Queensland Brain Institute	Postdoctoral Researcher
Miriam	Matamales	University of New South Wales	Postdoctoral Researcher
Chris	McBain	National Institutes of Health	Senior Investigator
Frederic	Meunier	Queensland Brain Institute	Senior Investigator
Frederic	Meunier	The University of Queensland	Senior Investigator
Bruce	Mockett	University of Otago	Postdoctoral Researcher
Sarasa	Mohammadi	The University of Sydney	Postdoctoral Researcher
Sean	Murphy	The Florey Institute of Neuroscience and Mental Health	PhD student
Patricio	Opazo	The University of Queensland	Senior Investigator
Paul	Orozco	Australian National University	PhD student
Yo	Otsu	Kolling Institute and University of Sydney	Postdoctoral Researcher
Sahil	Patel	University of Sydney	PhD student
John	Power	UNSW	Senior Investigator
Omar	Qureshi	UNSW	PhD student
Margreet	Ridder	Queensland Brain Institute	Postdoctoral Researcher
Katherine	Roche	National Institutes of Health	Senior Investigator
Bernardo	Sabatini	Harvard University	Senior Investigator
Pankaj	Sah	The University of Queensland	Senior Investigator
Philip	Sanders	The University of Auckland	PhD student
Morgan	Sheng	Genentech	Senior Investigator
Artur	Shvetcov	School of Psychology, UNSW	PhD student
Peter	Silburn	The University of Queensland	Senior Investigator
Phaedra	Stevens	Qld. Brain Institute	PhD student
Greg	Stuart	The Australian National University	Senior Investigator
Yajie	Sun	QBI	Postdoctoral Researcher

Jianyuan	Sun	Institute of Biophysics, Chinese Academy of Sciences	Senior Investigator
Vladimir	Sytnyk	University of New South Wales	Senior Investigator
Anne	Takesian	Massachusetts Eye and Ear	Senior Investigator
Amanda	Tan	University of New South Wales	PhD student
Angelo	Tedoldi	QBI	Postdoctoral Researcher
Susannah	Tye	The University of Queensland	Senior Investigator
Chris	Vaughan	Kolling Institute and University of Sydney - Northern	Senior Investigator
Bharat	Venkatesh	Queensland Brain Institute	PhD Student
Andres	Villu Maricq	University of Utah	Senior Investigator
Tristan	Wallis	Queensland Brain Institute	Postdoctoral Researcher
Liping	Wang	Shenzhen Institutes of Advanced Technology	Senior Investigator
Matthew	Williams-Spooner	UNSW	PhD student
Yvette	Wilson	The University of Melbourne	PhD student
Bryony	Winters	University of Sydney	Postdoctoral Researcher
Bryony	Winters	Kolling Institute and University of Sydney	Postdoctoral Researcher

## Appendix 2 – Conference Program

The conference program, along with all submitted abstracts, can be viewed at:

<https://qbi.uq.edu.au/files/36581/Neurons-Synapses-Circuits-Abstract-Book.pdf>

A copy is shown on the following pages.



# Neurons, synapses & circuits | from function to disease

16–18 August 2018, Q Station, Sydney

## DAY 1: THURSDAY AUGUST 16

6:00pm–7:00pm Session 1: Plenary speaker Chair: David Bredt

6:00pm Richard Huganir, JOHNS HOPKINS UNIVERSITY  
***Regulation of AMPA receptors and synaptic plasticity in cognitive disorders***

7:00pm Welcome reception and drinks

## DAY 2: FRIDAY AUGUST 17

8:30am–10:30am Session 2: Disorders of the nervous system Chair: Peter Silburn

8:30am David Bredt, JOHNSON AND JOHNSON  
***Getting a handle on neuropharmacology by targeting receptor-associated proteins***

9:00am Susannah Tye, THE UNIVERSITY OF QUEENSLAND  
***Impaired metabolic capacity and cellular resilience in antidepressant resistance***

9:30am Shengtao Hou, SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY  
***Profiling phytohormones in stroke brain—challenges and opportunities***

10:00am Robert Malenka, STANFORD UNIVERSITY  
***Neural mechanisms of social reward***

10:30am–11:00am Morning Tea

11:00am–12:30pm Session 3: Neural networks and systems Chair: Bernardo Sabatini

11:00am Liping Wang, SHENZHEN INSTITUTES OF ADVANCED TECHNOLOGY  
***Optogenetic dissection of neural circuits underlying processing of innate fear***

11:30am Anatol Kreitzer, UCSF  
***Striatal circuit dysfunction underlies motor deficits in a model of human dyskinesia***

12:00pm Ehsan Arabzadeh, THE AUSTRALIAN NATIONAL UNIVERSITY  
***Information processing in the rodent sensory cortex: population dynamics across behavioural states***

12:30pm–1:30pm Lunch

1:30pm–3:30pm Session 4: Inhibitory systems Chair: Greg Stuart

1:30pm Julie Kauer, BROWN UNIVERSITY  
***Inhibitory synapses and plasticity in the ventral tegmental area***

2:00pm Chris McBain, NATIONAL INSTITUTES OF HEALTH  
***Neuronal pentraxins control glutamate receptor driven development of hippocampal inhibitory circuits***

2:30pm Pankaj Sah, THE UNIVERSITY OF QUEENSLAND  
***The amygdala, prefrontal cortex and hippocampal circuit in fear learning***

3:00pm Bernardo Sabatini, HARVARD UNIVERSITY

3:30pm–6:00pm Afternoon free time

6:00pm–7:30pm Poster session

7:30pm–9:30pm Conference Dinner

# Neurons, synapses & circuits | from function to disease

16–18 August 2018, Q Station, Sydney

## DAY 3: SATURDAY AUGUST 18

8:30am–10:30am Session 5: Synaptic function and plasticity Chair: Rob Malenka

- 8:30am Morgan Sheng, GENENTECH  
***Molecular and cellular mechanisms of synapses loss in Alzheimer's disease and tauopathy***
- 9:00am Katherine Roche, NIH  
***NMDA receptor regulation: clues from rare variants implicated in disease***
- 9:30am Andres Villu Maricq, UNIVERSITY OF UTAH  
***A novel auxiliary protein that regulates the function of NMDA receptors***
- 10:00am Frederic Meunier, THE UNIVERSITY OF QUEENSLAND  
***Neurotransmitter release machinery in a nanoscale Brownian world***

10:30am–11:00am Morning Tea

11:00am–12:00pm Session 6: Plenary speaker Chair: Pankaj Sah

- 11:00am Diane Lipscombe, BROWN UNIVERSITY  
***Cell-specific splicing of neuronal calcium channels: mechanism, function and disease***

12:00pm–1:00pm Session 7: Short talks (selected from posters)

- Brian Billups, AUSTRALIAN NATIONAL UNIVERSITY  
Bryony Winters, UNIVERSITY OF SYDNEY  
Jianyuan Sun, CHINESE ACADEMY OF SCIENCES  
Tristan Wallis, UNIVERSITY OF QUEENSLAND

1:00pm–2:00pm Lunch

2:00pm–3:30pm Session 8: Therapeutics and diagnostics Chair: Susannah Tye

- 2:00pm Peter Silburn, THE UNIVERSITY OF QUEENSLAND
- 2:30pm Elizabeth Coulson, THE UNIVERSITY OF QUEENSLAND  
***Cholinergic dysfunction in Alzheimer's disease***
- 3:00pm Janet Keast, UNIVERSITY OF MELBOURNE  
***Mapping the visceral connectome for bioelectronic medicine***

3:30pm–4:00pm Afternoon tea

4:00pm–6:00pm Session 9: Neural networks and systems (part 2) Chair: Shengtao Hou

- 4:00pm Greg Stuart, THE AUSTRALIAN NATIONAL UNIVERSITY  
***Cellular and circuit mechanisms underlying processing of binocular visual information***
- 4:30pm Marta Garrido, THE UNIVERSITY OF QUEENSLAND  
***An afferent subcortical white matter pathway to the amygdala facilitates fear recognition***
- 5:00pm Bernard Balleine, THE UNIVERSITY OF NSW  
***The thalamostriatal network mediates flexible encoding for goal-directed action***
- 5:30pm Geoffrey Goodhill, THE UNIVERSITY OF QUEENSLAND  
***The development of neural coding in the zebrafish brain***

Closing remarks: Katherine Roche

## Appendix 3 – List of invited speakers

<b>FIRST NAME</b>	<b>LAST NAME</b>	<b>INSTITUTION</b>
Richard	Huganir	Johns Hopkins University
David	Bredt	Janssen Pharmaceutica
Susannah	Tye	Queensland Brain Institute
Shengtao	Hou	Southern University of Science and Technology
Robert	Malenka	Stanford University
Liping	Wang	Shenzhen Institutes of Advanced Technology
Anatol	Kreitzer	UCSF
Ehsan	Arabzadeh	The Australian National University
Julie	Kauer	Brown University
Chris	McBain	National Institutes of Health
Pankaj	Sah	Queensland Brain Institute
Bernardo	Sabatini	Harvard University
Morgan	Sheng	Genentech
Katherine	Roche	National Institute of Health
Andres	Villu Maricq	University of Utah
Frederic	Meunier	Queensland Brain Institute
Diane	Lipscombe	Brown University
Peter	Silburn	Queensland Brain Institute
Elizabeth	Coulson	Queensland Brain Institute
Janet	Keast	University of Melbourne
Greg	Stuart	The Australian National University
Marta	Garrido	Queensland Brain Institute
Bernard	Balleine	University of NSW
Geoffrey	Goodhill	Queensland Brain Institute

## Appendix 4 – Budget

The award from the International Society for Neurochemistry was used to help cover speaker travel, accommodation and registration. It also enabled us to maintain registration costs at a level that attracted high attendance from students and postdoctoral researchers: over two-thirds of our paid registrants were early career researchers.

Our program brought 13 international speakers to Australia, and awards from the ISN and other sponsors were extremely valuable in allowing us to recoup the majority of our costs. Despite this support, our expenses slightly exceeded our income, as can be seen in the budget below (the Queensland Brain Institute will fund the shortfall). A significant reason for this is likely the low registration fee we charged. As mentioned above, this was done to encourage attendance, particularly amongst student and postdoctoral researchers.

The fact that two thirds of our paying attendees were early career researchers indicates that our decision to keep a low, \$200 registration fee helped attract attendance amongst trainees. We reasoned that a higher registration fee, albeit subsidised through the ISN for early career researchers, would have resulted in lower overall attendance and been counterproductive to the meeting's aim of allowing as much interaction between students, postdocs, senior investigators and invited speakers as possible. Our decision was evidently the right one, as young researchers attended in high numbers and were grateful to have had the opportunity (see Testimonials, above). The conference therefore clearly met the goals of the ISN in enabling young researchers to attend small, intimate conferences with international thought leaders, and we are extremely grateful for the generous support of the ISN in this regard.

A full budget for the conference is below, and is followed by a breakdown of the use of ISN funds to cover speaker travel, accommodation and registration.

## Full budget for "Neurons, synapses & circuits: from function to disease"

### INCOME

Cash financial contributions	
- Queensland Brain Institute	5000
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Sponsorship	
- International Society for Neurochemistry Advance - 12000 USD	15562
- International Society for Neurochemistry 20% remainder - 3000 USD*	4000
- Janssen Pharmaceutica - 8000 USD	10152
- Zeiss	1500
- Coherent Scientific	1000
- BioLegend	1000
- Genentech - 4000 USD*	5333
- Centre for Integrative Brain Function (CIBF)	5000
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Registration income	13600
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	<b>INCOME RECEIVED \$</b>
	<b>62,147.80</b>

### EXPENDITURE

#### Return International Airfares

- Airfare Baltimore-Sydney (Keynote - Huganir)**	2000
- Airfare San Francisco-Sydney (Keynote - Malenka)**	2000
- Airfare Providence (RI)-Sydney (Keynote - Lipscombe)**	2000
- Airfare San Francisco-Sydney (Keynote - Sheng)**	2000
- Airfare Boston-Sydney (Keynote - Sabatini)**	2000
- Airfare San Diego-Sydney (Keynote - Bredt)	0
- Airfare Washington DC-Sydney (Keynote - Roche)	0
- Airfare Shenzhen-Sydney (Keynote - Wang)**	912
- Airfare Shenzhen-Sydney (Hou)**	912

- Airfare Providence (RI)-Sydney (Kauer)	2000
- Airfare Washington DC-Sydney (McBain)	2000
- Airfare Salt Lake City-Sydney (Villu Maricq)**	2000
- Airfare San Francisco-Sydney (Kreitzer)**	2000

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#### Return Domestic Airfares

- Airfare Brisbane-Sydney (x4: Tye, Sah, Goodhill, Coulson)**	2000
- Silburn	546
- Garrido	577
- Meunier	539
- Airfare Melbourne-Sydney (Keast)	400
- Airfare Canberra-Sydney	
- Stuart	408
- Arabzadeh**	400

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#### Accommodation

- 12 speakers single share accommodation @ 199 AUD/night + 1 extra night Katherine Roche +7x extra persons @30/night	5185
- 12 speakers twin share accommodation @ 229 AUD/night	5496

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#### Conference dinner

- 75 AUD pp, 100 registrants	7500
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#### Other costs

- venue hire, 80 AUD per day, per person	16000
- poster boards, 20 x 30 AUD + \$320 delivery + GST	1012
- extra room hire for poster session	200
- drinks (1x 2 hr @\$29/head; 1x 1 hr @ \$24/head)	4770
- conference booklet printing, 100 x 3 AUD	300
- audiovisual equipment	1286

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<b>TOTAL EXPENDITURE (TO DATE) \$</b>	<b>48,219.00</b>
<b>TOTAL EXPENDITURE (FORECAST) \$</b>	<b>66,443.00</b>

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<b>Current balance</b>	\$	13,928.80
<b>Projected balance</b>	-\$	4,295.20

\* estimated exchange rate of 1 AUD = 0.75 USD

\*\* budgeted expense, not yet claimed

\*\*\* negative balance implies costs to be covered by the Queensland Brain Institute

## Budget for ISN-related expenses

BUDGET ITEM	VALUE
<b>International airfares</b>	
- Principal speaker David Bredt**	2000
- Principal speaker Richard Hujanir**	2000
- Principal speaker Liping Wang**	2000
- Principal speaker Diane Lipscombe**	2000
- Speaker Morgan Sheng**	2000
- Speaker Rob Malenka**	2000
- Speaker Julie Kauer	2000
<b>Domestic airfares</b>	
- Principal speaker Marta Garrido	525
- Principal speaker Greg Stuart	408
<b>Speaker accommodation</b>	
- 5x Single share accommodation for 2 nights	1990
- 3x Twin share accommodation for 2 nights (covers 4 of listed speakers)	1374
<b>Speaker registration</b>	
- Registration for 9 speakers listed above	1800
<b>TOTAL COST COVERED BY ISN</b>	20097
<b>VALUE OF AWARD FROM ISN*</b>	19641.77
<b>BUDGET BALANCE***</b>	-455.23
* Based on true value of 80% award received and current exchange rate	
** Budgeted - cost not yet claimed by speaker	
*** negative balance implies cost to be covered by other sponsorships etc.	