

**WEEK 1 PROGRAM: NEURONAL EXCITABILITY**

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<b>SUNDAY 23 APRIL</b>	<b>WELCOME</b>
17.00	<b>Welcome remarks</b> <i>Pankaj Sah, Director, Queensland Brain Institute, Brisbane</i>
17.15	<b>Safety introduction</b> <i>Kevin Townsend, Manager, Moreton Bay Research Station</i>
18.00	<b>Welcome dinner</b>

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<b>MONDAY 24 APRIL</b>	<b>FUNDAMENTALS OF ELECTROPHYSIOLOGY</b>
09.00 - 09.30	<b>Course overview</b> <i>Stephen Williams, Queensland Brain Institute, Brisbane</i>
09.30 - 10.30	<b>Basic membrane biology and circuit analysis</b> <i>Peregrine Osborne, University of Melbourne</i>
11.00 - 12.30	<b>Principles of electrophysiological recording</b> <i>Stuart Brierley, Flinders University, Adelaide</i>
14.00 - 19.00	<b>In the Lab:</b> Familiarization with equipment, software, solutions and brain slices
20.00 - 21.00	<b>Student research talks</b> (4 students, 10 min talk, 5 min questions)

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<b>TUESDAY 25 APRIL</b>	<b>FUNDAMENTALS OF NEURONAL EXCITABILITY</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.00	<b>How to structure your data for efficient analysis</b> <i>Jan Dolzer, Sutter Instrument, USA</i>
11.00 -	Pause
11.30 - 12.30	<b>Brain slices - use and abuse</b> <i>Yossi Buskila, The MARCs Institute, Sydney</i>
13.30 - 18.30	<b>In the Lab:</b> Basics of patch clamping
20.00 - 21.00	<b>Student research talks</b> (4 students, 10 min talk, 5 min questions)

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<b>WEDNESDAY 26 APRIL</b>	<b>ACTION POTENTIALS</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 10.45	<b>Voltage-gated channels underlying neuronal excitability</b> <i>Steve Petrou, Florey Institute, Melbourne</i>
11.15 - 12.30	<b>Axons and excitability</b> <i>Maarten Kole, Netherlands Institute for Neuroscience</i>
13.30 - 18.30	<b>In the Lab:</b> Whole-cell voltage and current clamp recording
20.00 - 21.00	<b>Student research talks</b> (4 students, 10 min talk, 5 min questions)

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<b>THURSDAY 27 APRIL</b>	<b>THE ELECTRICAL STRUCTURE OF NEURONS</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.00	<b>The electrical structure of neurons</b> <i>Greg Stuart, John Curtin School of Med Res, Canberra</i>
11.30 - 12.30	<b>Review of lab skills and data analysis</b> <i>The laboratory demonstrators</i>
13.30 -	<b>In the Lab:</b> Whole-cell and cell-free voltage and current clamp recording

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<b>FRIDAY 28 APRIL</b>	<b>IN VIVO RECORDING</b>
09.00 - 10.00	<b>In vivo recording techniques</b> <i>Saba Gharaei, John Curtin School of Med Res, Canberra</i>
10.30 - 12.30	<b>Neural coding</b> <i>Ehsan Arabzadeh, John Curtin School of Med Res, Canberra</i>
13.30 - 18.30	<b>In the Lab:</b> In-vivo juxtacellular and whole-cell recording

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<b>SATURDAY 29 APRIL</b>	<b>SYSTEMS AND COMPUTATIONAL NEUROSCIENCE</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 10.45	<b><i>Systems neuroscience</i></b> <i>Adam Morris, Monash University, Melbourne</i>
11.15 - 12.30	<b>Computational tools in neuroscience</b> <i>Geoff Goodhill, Queensland Brain Institute, Brisbane</i>
13.30 -	<b>In the Lab:</b> Free practice, in-vivo and in-vitro techniques
20.00 - 21.00	<b>Hot Topic with Pizza &amp; Drinks:</b> TBA <i>Mark Cook, The University of Melbourne</i>

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<b>SUNDAY 30 APRIL</b>	<b>FREE, DAY:</b> Tour the Island
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## WEEK 2 PROGRAM: NEURONAL NETWORKS

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<b>MONDAY 1 MAY</b>	<b>FUNDAMENTALS OF SYNAPTIC TRANSMISSION</b>
09.00 - 11.00	<b>Molecular structure and function of synapses</b> <i>Victor Anggono, Queensland Brain Institute, Brisbane</i>
11.30 - 12.30	<b>Introduction to the physiology of synaptic transmission</b> <i>Elena Bagley, University of Sydney</i>
13.00 - 14.00	<b>Hot topic Lunch:</b> Probing the mechanisms underlying place cells in a treadmill apparatus. <i>Sebastien Royer, KIST, Republic of Korea</i>
14.00 -	<b>In the Lab:</b> Sponts, minis and pairs

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<b>TUESDAY 2 MAY</b>	<b>SYNAPTIC TRANSMISSION - NEW APPROACHES</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.00	<b>Mechanisms and dynamics of neurotransmitter release</b> <i>John Bekkers, John Curtin School of Med Res, Canberra</i>
12.00 -	<b>In the Lab:</b> Use-dependent synaptic plasticity
20.00 - 21.00	<b>Hot Topic with drinks:</b> Optical mapping of synaptic connectivity. <i>Jinny Kim, KIST, Republic of Korea</i>

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<b>WEDNESDAY 3 MAY</b>	<b>SYNAPTIC INTEGRATION</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.00	<b>Synaptic integration</b> <i>Mark Harnett, MIT, USA</i>
11.30 - 13.00	<b>Microelectrode array recording technologies</b> <i>Thomas Meyer, Multi Channel Systems, Germany</i>
14.00 -	<b>In the Lab:</b> Recordings from interneurons, paired recordings

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<b>THURSDAY 4 MAY</b>	<b>MICROCIRCUITS</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.30	<b>Neuronal microcircuits and networks</b> <i>Mark Harnett, MIT, USA</i>
12.00 -	<b>In the Lab:</b> Dendritic recording

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<b>FRIDAY 5 MAY</b>	<b>MICROCIRCUITS AND BEHAVIOUR</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.00	<b>Linking synaptic / intrinsic plasticity with behaviour</b> <i>Andreas Frick, Neurocentre Magendie, University Bordeaux, France</i>
11.30 - 13.00	<b>Network dysfunction in disease</b> <i>Chris Reid, Florey Institute, Melbourne</i>
14.00 -	<b>In the Lab:</b> Long-term potentiation, intrinsic plasticity

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<b>SATURDAY 6 MAY</b>	<b>PROJECT</b>
09.30 - 11.30	<b>Recording Prizes and Project Discussion</b> <i>The laboratory demonstrators</i>
12.00 -	<b>Lab Project</b>

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<b>SUNDAY 7 MAY</b>	<b>FREE DAY</b>
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## WEEK 3 PROGRAM: IMAGING AND CONTROL OF NEURONAL CIRCUITS

<b>MONDAY 8 MAY</b>	<b>OPTICS AND FLUORESCENCE IMAGING</b>
09.30 - 10.30	<b>Introduction to imaging neuronal activity</b> <i>Lucy Palmer, Florey Institute, Melbourne</i>
11.00 - 13.00	<b>Calcium imaging: techniques and applications</b> <i>George Augustine, Lee Kong Chian School of Medicine, Singapore</i>
14.00 -	<b>In the Lab:</b> Single-cell calcium imaging in brain slices
<b>TUESDAY 9 MAY</b>	<b>ADVANCED IMAGING TECHNIQUES</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.00	<b>Advanced imaging techniques</b> <i>Vincent Daria, John Curtin School of Med Res, Canberra</i>
11.30 - 13.00	<b>New research methods</b> - In vivo imaging of synaptic activity in the cortex. <i>Juliette Cheyne, The University of Auckland, NZ</i>
14.00 -	<b>In the Lab:</b> Calcium imaging of network activity
20.00 - 21.00	<b>Hot Topic with drinks:</b> Using optogenetics to map microcircuits. <i>George Augustine, Lee Kong Chian School of Medicine, Singapore</i>
<b>WEDNESDAY 10 MAY</b>	<b>CONTROLLING AND RECORDING NEURONS WITH LIGHT</b>
09.00 - 09.30	<b>Lab debrief</b>
09.30 - 11.00	<b>Optogenetics</b> <i>John Lin, University of Tasmania</i>
11.30 - 13.00	<b>Optical neurophysiology</b> <i>Brad Baker, Centre for Functional Connectomics, KIST, Republic of Korea</i>
13.30 -	<b>In the Lab:</b> Controlling and recording from neurons with light
<b>THURSDAY 11 MAY</b>	<b>PROJECT</b>
09.00 -	Lab Project

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**FRIDAY 12 MAY**

**PROJECT WRAP-UP**

09.00 - 15.30

Laboratory project analysis

16.00 - 18.00

Project presentations

19.30 -

Closing Dinner

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**SATURDAY 13 MAY**

Farewell and departure

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