

## **Eccles Institute of Neuroscience**

Some of the research themes available to applicants for Honours or PhD study are listed here. Many other research topics and projects are available in this Department, and can be discussed with the Group leaders below.



### **Associate Professor Ehsan Arabzadeh**

*The Arabzadeh Group - Neural Coding*

- Signal processing in the sensory cortex
- Sensory decision making in rodent whisker system
- Neuronal mechanisms underlying selective attention in rodents
- Sensory adaptation



### **Professor John Bekkers**

*The Bekkers Group - Olfaction*

- Electrical properties of neurons in the olfactory cortex
- Development of olfactory circuits in the brain
- Epilepsy and olfaction
- Odour-learning behaviours in mice and the brain circuits that underlie them



### **Dr Brian Billups**

*The Billups Group - Synaptic Mechanisms in the Central Nervous System*

- The role of astrocytes in regulating synaptic transmission
- Mechanisms of neurotransmitter recycling at central synapses
- NMDA receptor co-agonists and regulation synaptic activation
- Novel fluorescent probes for measuring brain amino acids
- Mathematical modelling of amino acid transporters in brain tissue



### **Dr Nathalie Dehorter**

*The Dehorter Group – Neuronal Development*

- Role of a transcription factor involved in cell identity and function
- Developmental expression and role of a receptor involved in schizophrenia
- Early signs of impaired neuronal activity in a mouse model of autism



### **Professor Ted Maddess**

*The Maddess Group - Diagnostics for Eye Diseases Group*

- Multifocal pupillographic objective perimetry
- Retest variability of ophthalmic instruments
- Testing for neurological disorders
- Higher order image statistics and image texture



### **Dr Riccardo Natoli**

*The Natoli Group - Gene expression in the human macula*

- Role of miRNA in retinal degenerations
- The use of miRNA as potential therapeutic targets in diseases causing retinal degenerations
- Understanding the role of glia in the progression of Age-Related Macular Degeneration
- Novel therapeutics for reducing inflammation and oxidative stress in the progression of Age-Related Macular Degeneration



### **Associate Professor Christian Stricker**

*The Stricker Group - Neuronal Networks*

- The impact of neuromodulation on synapses and firing in cortex
- Matching of synaptic dynamics with postsynaptic firing
- Calcium imaging from nerve terminals
- Calcium fluxes in lymphocytes



## **Professor Greg Stuart**

*The Stuart Group- Neuronal Signalling*

- Discovering how neurons integrate information
- Determining the properties and role of dendrites in neuronal function
- Understanding how visual information from the eyes is processed by the brain

