2016 ARC & NHMRC Grants

The School has had an extremely successful year for grant funding commencing 2016. In the recent announcements from the ARC and NHMRC we had 16 successful applications. Congratulations to all our successful applicants.

Short summary (further details below):

ARC DECRA:
- Dr Ben Colagiuri
- Dr Sally Gainsbury
- Dr Patrick Goodbourn

ARC Discovery Projects
- Professor Barton Anderson
- Professor Sally Andrews
- Dr Evan Livesey; Professor Justin Harris; Dr Irina Harris; Professor Carlo Miniussi
- Professor Iain McGregor
- Dr Bernard Balleine; Professor Steven Meikle; Associate Professor Roger Fulton

NHMRC Project grants
- Professor Iain McGregor, Professor Mary Collins Chebib, Professor Inga Neumann, Doctor Michael Bowen
- Professor Michael Katie, Professor Iain McGregor, Professor Mark Connor
- Doctor Blake Dear (Macquarie University), Professor Nickolai Titov, Professor Michael Jones, Doctor Shehzad Ali, Professor Ann Louise Sharpe, Doctor Milena Gandy, Doctor Olav Nielsen

NHMRC Dementia Research Development Fellowship (all from Sharon Naismith’s group)
Dr Shantel Duffy
Dr Loren Mowszowski
Dr Manreena Kaur
Dr Camilla Hoyos
Dr Angela D'Rozario
3 ARC DECRA fellowships;

1) Dr Ben Colagiuri
This project seeks to develop and experimentally test a new model of placebo effects that will unpack how expectancy, control, and conditioning combine to produce placebo effects. The placebo effect is a fascinating and important psychological phenomenon whereby improvement occurs following a sham treatment. Despite considerable evidence for placebo effects across various health, sporting, and educational outcomes, exactly how these effects are formed and maintained remains unclear. Greater understanding of the placebo effect would enable us to accurately evaluate health, educational, and sporting interventions and would facilitate the development of interventions that harness the placebo effect to improve outcomes.
The University of Sydney
$382,536.00

2) Dr Sally Gainsbury
This project aims to increase our understanding of what aspects of websites encourage people to engage in risky behaviours. Risk taking in online environments can have significant negative consequences, such as being a victim or perpetrator of cybercrime. This project aims to develop and test a conceptual model to understand the psychological processes underlying risk taking online, focusing on the impact of social cues and specific online environmental cues. Anticipated project outcomes will benefit policy-makers by identifying how sites can be made safer and may also show how to educate people to make safe decisions online and to avoid sites that may encourage them to take risks or engage in anti-social behaviours.
The University of Sydney
$369,000.00
3) Dr Patrick Goodbourn  
This project aims to reveal the relationship between genes, brain and behaviour in visual perception, where underlying brain activity can be decoded from electrical signals. Modern molecular genetics promises unprecedented insights into human psychology. But progress has been slower than expected because the brain mechanisms linking genes to behaviours are incredibly complex. Project results are expected to show how common variations in genes affect our brain's response to visual stimulation, and how this in turn alters our perceptual experience and behavioural reactions. These discoveries aim to cast new light on the architecture and development of the mind, and provide a new model for investigating the genetic basis of other psychological traits. 
The University of Sydney

$385,536.00
4 ARC Discovery Projects:

1) Professor Barton Anderson
The project aims to understand how we perceive the material properties and structure of our visual world. Our successful behaviour requires having a clear representation of the material properties of the objects and surfaces that fill our environment, such as their shape and material properties. The human visual system is currently the most sophisticated computational system for deriving the three-dimensional structure and material properties of objects. The project plans to use new methods and stimuli to determine the information that the visual system uses to construct our representation of three-dimensional shapes and the material properties of objects, and the visual computations that underlie the extraction of this information. This may be applicable in any domain in which the recovery of three-dimensional shape and material is critical (eg automated industry applications or medical scenarios).
The University of Sydney
$466,631.00

2) Professor Sally Andrews
This project plans to use expert readers to provide a window on what defines optimal reading. Reading is a complex skill that requires precise coordination of cognition, perception and attention. By measuring skilled readers’ eye movements while they read sentences and short passages, the experiments are designed to investigate how individual differences in reading, spelling and vocabulary influence the timing and coordination of word identification and comprehension processes during normal reading and how this changes with a readers’ goals. The results would distinguish between competing theories of how skilled readers balance word identification and comprehension processes, an issue that is critical to current debates about how reading should be taught.
The University of Sydney
$328,892.00
3) Dr Bernard Balleine; Professor Steven Meikle; Associate Professor Roger Fulton
The objective of the project is to combine an investigation of basic learning paradigms with functional Positron emission tomography (PET) imaging in rats in order to answer critical questions about the neurobiological basis of learning and decision-making in the brain. MicroPET technology provides PET images without the confounds induced by anaesthesia. Using this technology, the project intends to observe whole-brain changes in dopamine neurotransmission in awake, behaving rats while they learn to predict motivationally relevant outcomes based on environmental cues and on their own actions (ie during Pavlovian and instrumental conditioning, respectively). The outcomes of this research may improve our understanding of the neural changes responsible for debilitating disorders of the brain and mind.
The University of Sydney
$995,000.00

4) Dr Evan Livesey; Professor Justin Harris; Dr Irina Harris; Professor Carlo Miniussi
The project intends to explore how accidents and errors in decision-making occur when people are operating on ‘auto-pilot’. Adapting our behaviour to changing environmental demands is fundamental to our survival. However, often it requires deliberate cognitive control to override previously learned, but no longer appropriate, associations between cues in the environment and our responses. This project plans to use manipulations of cognitive control over simple associative learning, in conjunction with neurophysiological investigations of neuronal excitability in motor cortex, to understand how well-learned responses are prepared in the presence of cues that signal those responses; how these responses are brought under cognitive control when response requirements change; and what happens to behaviour when that control is impaired. This knowledge may help us to design environments in which the probability of errors is minimised.
The University of Sydney
$395,000.00
Rodents show innate fear towards the fur and skin odours of cats. This project seeks to describe the mechanisms behind this phenomenon and determine the potential of cat fur odours as rodent repellents in the field. The project plans to first verify the repellent effects of cat fur on various rat species and house mice in various field locations. It then plans to isolate, identify and synthesise the molecules in cat fur that cause rodent repellent effects and determine their action on rodent pheromone-sensing receptors. Novel cat fur-derived molecules identified in the laboratory will be further tested in the field. Expected project outcomes will be a powerful new rodent repellent with the potential to protect crops and homes, and an understanding of the precise physiological mechanisms whereby feline odours can repel rats and mice which could be used to further develop novel rodent repellents.

$390,400
4 NHMRC project grants

1) 
CIA - Professor Iain McGregor
CIB - Professor Mary Collins Chebib
CIC - Professor Inga Neumann
CID - Doctor Michael Bowen
CIE - Doctor Andrew Clarkson
Project Grants
Standard Project Grant
Oxytocin as a novel antagonist of the intoxicating and addictive effects of alcohol
University of Sydney

2016 - 2019
$739,106

Basic Science
PHARMACOLOGY AND PHARMACEUTICAL SCIENCES
Pharmacology and Pharmaceutical Sciences not elsewhere classified
alcohol abuse
oxytocin
gamma-aminobutyric acid (GABA) receptors
animal model
electrophysiology
Alcohol is Australia’s most harmful recreational drug and more effective treatments for alcohol abuse are desperately needed. The CIs have shown that administering oxytocin reduces alcohol intoxication and consumption, and prevents alcohol from acting at specific sites in the brain that are central to alcohol’s intoxicating and addictive effects. This project probes the effects of oxytocin at these sites and the potential utility of targeting this interaction to treat alcohol-use disorders.
Synthetic cannabinoids (SCs) have been recently linked to many deaths and hospitalizations but there is limited data available that addresses these issues. We have identified SCs which display unprecedented cannabinoid receptor function, unusual selectivity, and SCs with high activity at cannabinoid receptors. This project will define the role of CB receptors in the actions of SCs, and provide an evidence-based rationale for treating SC overdoses.
CIA: Doctor Blake Dear (Macquarie University)
CIB: Professor Nickolai Titov
CIC: Professor Michael Jones
CID: Doctor Shehzad Ali
CIE: Professor Ann Louise Sharpe
CIF: Doctor Milena Gandy
CIG: Doctor Olav Nielsen

Project Grants
Standard Project Grant
Increasing access to effective psychological treatment for Australians with chronic physical disease.
Macquarie University

Public Health
PSYCHOLOGY
Health, Clinical and Counselling Psychology
chronic diseases
mental health
treatment evaluation
internet service delivery
health economics

Chronic physical diseases have a profound impact on Australian lives. The rates of anxiety and depression among Australians with chronic physical diseases are very high. However, less than 1 in 5 access any mental health treatment and, of those, less than 1 in 2 receive an effective psychological treatment. This project combines two significant innovations with the goal of increasing access to effective mental health treatment for Australians with chronic physical disease.
NHMRC Dementia Research Development Fellowships

1) Dr Shantel Duffy
Targeted Calls for People
NHMRC-ARC Dementia Research Development Fellowship
Neuroimaging insights into sleep-wake dysfunction in older adults 'at risk' of developing dementia
University of Sydney

2016 - 2019
$548,235

Clinical Medicine and Science
OTHER MEDICAL AND HEALTH SCIENCES
Medical and Health Sciences not elsewhere classified
sleep disturbance
mild cognitive impairment
magnetic resonance imaging (MRI)
secondary prevention
oxidative stress

This program of research aims to investigate the biological mechanisms underlying the relationship between sleep dysfunction and dementia. I aim to apply my magnetic resonance imaging expertise and experience working with individuals ‘at risk’ of dementia and further develop my emerging skills in sleep research, to improve our understanding of this fundamental relationship and investigate the effect of targeted interventions and longitudinal clinical outcomes in ‘at risk’ older adults.
2) Dr Loren Mowszowski
Targeted Calls for People
NHMRC-ARC Dementia Research Development Fellowship
Cognitive interventions for older adults at-risk of dementia and with early-stage neurodegenerative disease
University of Sydney

2016 - 2019
$544,348

Clinical Medicine and Science
PSYCHOLOGY
Biological Psychology (Neuropsychology, Psychopharmacology, Physiological Psychology)
dementia
mild cognitive impairment
secondary prevention
early intervention
translational research
My postdoctoral research program focuses on secondary prevention for cognitive decline and early intervention for mild-stage dementia, by developing and evaluating cognitive interventions e.g. Cognitive Training, psychoeducation, adjunctive therapies and e-health. I am perfectly positioned for this research, with an established track record in aging, ideal research environment, excellent supervision/collaborative opportunities, and unique background of both research and clinical training.
3) Dr Manreena Kaur  
Targeted Calls for People  
NHMRC-ARC Dementia Research Development Fellowship  
Can repetitive transcranial magnetic stimulation improve cognition and neuropsychiatric features in mild cognitive impairment and early stage Alzheimer’s disease?  
University of Sydney  
2016 - 2019  
$603,622  
Clinical Medicine and Science  
NEUROSCIENCES  
Central Nervous System  
Alzheimer disease  
mild cognitive impairment  
transcranial magnetic stimulation (TMS)  
neurophysiology  
cognition  
This research will evaluate a novel treatment, repetitive transcranial magnetic stimulation, for cognitive decline and mood disturbance in those at risk for or at early stages of Alzheimer’s disease. By using a range of measures reflecting brain function, this research aims to identify features of patients that predict response to this treatment. Critically, this work will inform early intervention strategies and contribute to better treatment selection guidelines for Alzheimer’s disease.
4) Dr Camilla Hoyos  
Targeted Calls for People  
NHMRC-ARC Dementia Research Development Fellowship  
Sleep-wake disturbances and cardio-metabolic dysfunction in at risk dementia: a novel pathway in neurocognitive decline’  
University of Sydney  
2016 - 2019  
$558,305  
Clinical Medicine and Science  
COGNITIVE SCIENCE  
Cognitive Science not elsewhere classified  
dementia  
sleep disturbance  
circadian rhythms  
metabolic disorders  
cardiovascular risk  
Age-related sleep and circadian disturbance and cardio-metabolic dysfunction are associated with an increased risk of dementia. This research aims to delineate the pathway in which sleep and circadian disturbances and cardio-metabolic dysfunction promote cognitive decline during the ‘at risk’ dementia phase. This will improve our understanding of key processes in cognitive ageing ultimately leading to the development of targeted intervention programs in the quest to delay the onset of dementia.
5) Dr Angela D'Rozario  
Targeted Calls for People  
NHMRC-ARC Dementia Research Development Fellowship  
Sleep, plasticity and neurodegeneration: Targeting sleep to improve cognition in Mild Cognitive Impairment (MCI)  
University of Sydney  
2016 - 2019  
$525,116  

Clinical Medicine and Science  
NEUROSCIENCES  
Neurosciences not elsewhere classified  
sleep  
dementia-related decline in memory  
sleep disturbance  
neurophysiology  
neuroimaging  

Older individuals with mild cognitive impairment commonly experience disturbed sleep and about 50% will convert to dementia. It is unclear whether sleep disturbance mediates cognitive decline and progression to dementia. Optimising sleep presents a novel strategy to slow disease progression. This new research program explores links between sleep and dementia to identify new biomarkers of disease progression and new targeted therapeutic approaches to improve quality of life for older Australians.