



# 2019 ANNUAL REPORT

Monash Alfred Psychiatry research centre (MAPrc)  
& Epworth Centre for Innovation in Mental Health (ECIMH)





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## MONASH ALFRED PSYCHIATRY RESEARCH CENTRE (MAPrc)



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# MAPrc, ECIMH & DEPARTMENT OF PSYCHIATRY CENTRAL

Since 1994, Professor Jayashri Kulkarni, Professor Paul Fitzgerald, and Anthony de Castella have worked together to build the Monash Alfred Psychiatry research centre (MAPrc) into one of the largest and most impactful clinical research centres in Australia.

Starting in 1994 at the Dandenong Area Mental Health Service, where Jayashri was Clinical Director and Monash University Department of Psychiatry Associate Professor, and Paul Fitzgerald was a young psychiatry registrar, the Dandenong Psychiatry Research Centre (DPRC) was launched, and Anthony, the now MAPrc Manager, was employed as a part time research assistant. Together the trio worked to build the DPRC into a thriving and energetic clinical research centre. In 2002 Jayashri took up the position of Professor of Psychiatry at The Alfred and brought with her most of the growing team of around 20 staff and students. From there the Alfred Psychiatry Research Centre (APRC) flourished in an old and dilapidated building at the back of the hospital.

In 2012, the centre moved to its current location and became known as the Monash Alfred Psychiatry research centre (MAPrc) with over one hundred research, academic, teaching and administration staff and students. Comprising several active research teams and two major divisions (Women's Mental Health, led by Jayashri, and Therapeutic Brain

Stimulation, led by Paul), and with a central role in HDR supervision and teaching into the Monash University medicine curriculum, the Centre in 2019 underwent two major changes. Firstly, Paul Fitzgerald, who was by then working across both Alfred Health and Epworth Health – Camberwell, established the Epworth Centre for Innovation in Mental Health, which primarily comprised his Therapeutic Brain Stimulation Division team. And secondly, Jayashri Kulkarni was appointed Head of Department for Psychiatry – Central Clinical School, Monash University. The timing was perfect in allowing the evolution of MAPrc into a Department of Psychiatry with two thriving research centres, one at the Alfred and one at Epworth Health, thereby allowing the synergistic relationship and friendship to continue. Thus, 2019 was a highly significant year with major changes, relocations, and new beginnings. The Department of Psychiatry Central, is now well placed to deliver world class academic, teaching, clinical and research outputs that will continue to impact on the lives of patients, researchers, clinicians, academics and students in the years ahead.

## Report Contents Overview

To reflect the significant structural changes that occurred during 2019, this report will include high level information covering the Department and both Centres, including staff, teaching, publications, and finances, while information about research, clinics, courses and awards will be presented separately for MAPrc and ECIMH.

The Department of Psychiatry Central sits within the Central Clinical School, Faculty of Medicine, Nursing and Health Sciences, Monash University. The Department coordinates and delivers mental health teaching into the Medicine curriculum and coordinates placements of medical students with affiliated hospitals across Victoria. The Department also enrolls honours and HDR students and provides supervision by staff located across MAPrc and ECIMH.

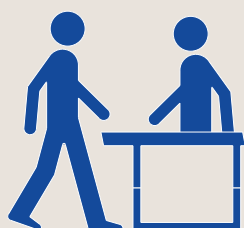
The Department has an operational budget which finances teaching, research support and other higher-level activities within the two centres. Both centres also have budgets which cover research and support staff, project costs, short course related costs and other Centre-related expenses.



# MAPrc AT A GLANCE

**2,500+**

Participant  
Visits



**100+**

Research Projects  
& Clinical Trials



**200+**

Publications  
& Conference  
Presentations



**150+ team**

Personnel including Senior Researchers, Research Assistants, Research Nurses, Study Coordinators, Clinicians, Academics, Volunteers, Affiliates, Honours, Masters & PhD Students, Overseas Visitors/Observers, Administration Staff, and Managers



**\$6 Million**

Annual Turnover



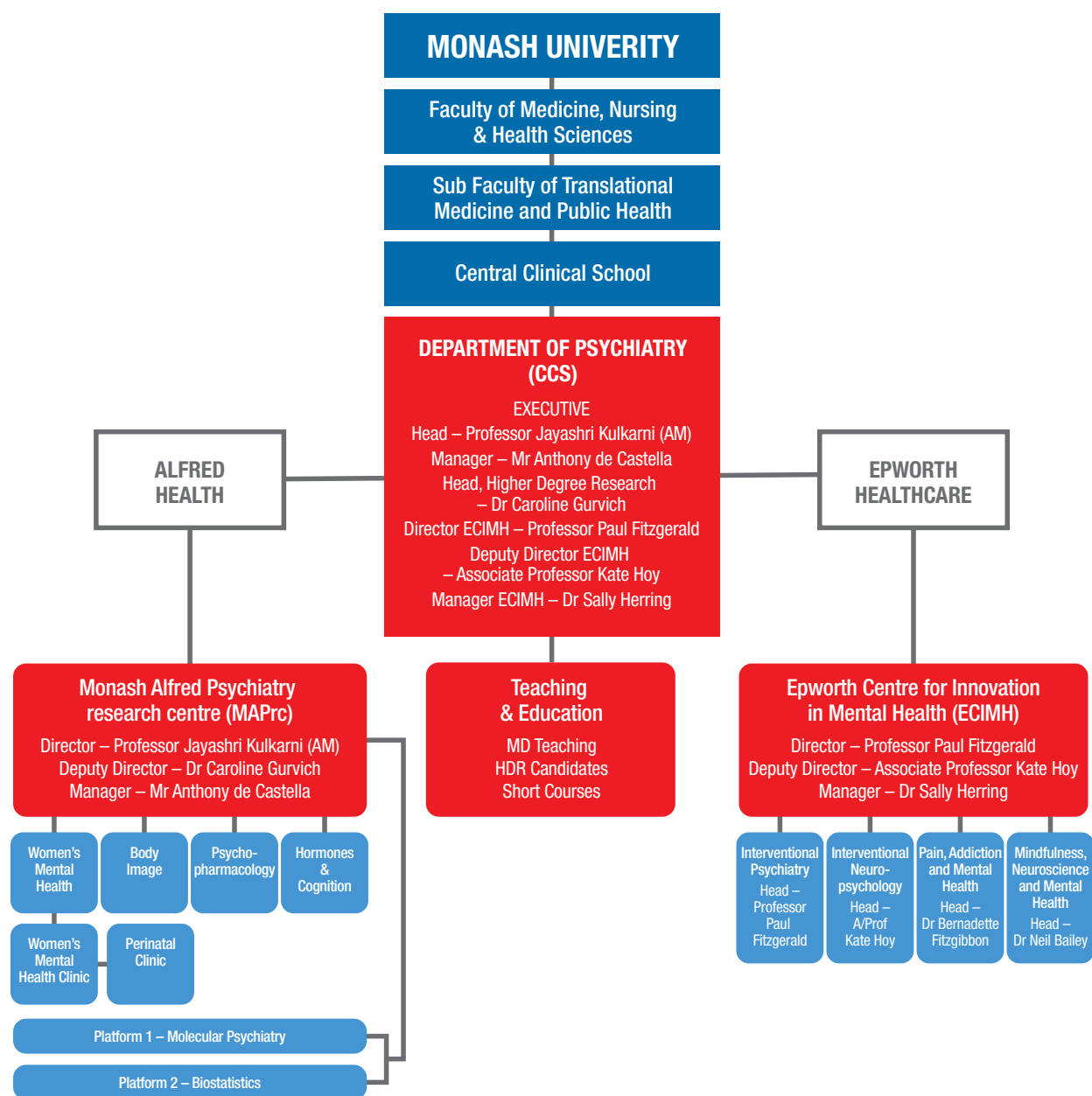
**Strong Media  
& Community  
Impact**



**Local, National  
& International  
Partners &  
Collaborators**



# DEPARTMENT OF PSYCHIATRY CENTRAL: ORGANISATIONAL CHART





# TEACHING

## Medical Student Teaching

### MED4190 Monash University MD Year 4C Psychiatry

#### Year 4C Teaching Team

**Prof Jayashri Kulkarni**  
Department Head

**Dr Sarah Rotstein**  
Academic Coordinator for 4C  
Psychiatry Teaching at Alfred Health

**Anne Crawford**  
Clinical Site Administrator

**Amy Laslett**  
Part-time Administrator

**Tiffany Davis**  
Part-time Administrator

Our team's role consists of coordinating the year 4C psychiatry teaching program at Alfred Health and, at a faculty level, curriculum review and development, and evaluation of the psychiatry teaching program across all years of the Monash MBBS/MD degree.

### Psychiatry Teaching at Alfred Health

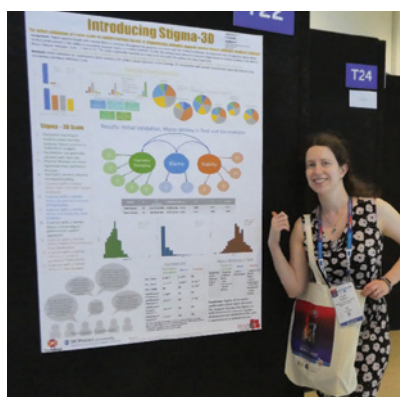
At the Alfred, our students gain a wide-ranging experience in Psychiatry through placement at a range of Alfred Health's psychiatric services. Each student has the opportunity to attend clinical placements at the following services: inpatient units at the Alfred Hospital, Alfred Health Community Mental Health Service clinics, Malvern Private Hospital's Drug and Alcohol Addiction Recovery Treatment program, Alfred Health's Aged Psychiatry Department at Caulfield Hospital, Alfred Health's CATT and the Emergency Psychiatry Service, Headspace Moorabbin and Alfred Health Consultation Liaison and Drug and Alcohol services.

As well as direct clinical experience, our teaching program includes a formal tutorial program, which utilises the extensive knowledge and teaching expertise of senior academics within Alfred Psychiatry. In 2019, we continued our full day of teaching from the Child and Youth Mental Health Service at Moorabbin, half-day teaching on cognitive assessment and capacity and intensive exam preparation tutorials including practice clinical examinations and quizzes.

Our psychiatry teaching team continues to identify opportunities to improve students' learning experience. Student feedback and assessment indicates that these initiatives are having dramatic effects in increasing satisfaction with the course and quality of learning.



*Phenomenology Charades is an award-winning card game developed by Dr Rotstein to assist students to learn psychiatry terminology.*



*In May 2019, Dr Rotstein attended the annual RANZCP Congress, where she presented an oral presentation and a poster on her research into medical student stigma.*

*In Dec 2019, Christmas hampers and certificates were distributed to all the clinical placement sites as a thank you from the teaching team and the students.*

## Teaching (continued)

### **MED5091 Monash University MD Year 5D Psychiatry Selective**

#### **Year 5 Teaching Team**

**Prof Jayashri Kulkarni**  
Clinical Supervisor

**Aileen McInerney**  
Administrative Officer

Monash University Year 5D MBBS medical students are required to complete a specialty clinical placement. The aim of this placement is to broaden their knowledge and skills in areas of clinical practice of their own choosing in a six-week clinical placement.

Students who nominate to undertake a Year 5D Psychiatry Specialty or Selective at the Alfred Hospital have their time split between shadowing Professor Kulkarni at her clinical work (at the MAPrc Women's Mental Health Clinic), and supervision, under a psychiatrist and registrar, on one of the Alfred Hospital Psychiatry Inpatient Units.

Under Prof. Kulkarni's supervision the students give a weekly case presentation, attend the Women's Mental Health team weekly case meeting and assist the team by following up pathology test results and writing notes.

### **Bachelor of Medical Science (Honours)**

The Monash University Bachelor of Medical Science (Honours) is a twelve-month degree programme for MBBS students and graduates. The program introduces students to research practice in a research setting with Australian and internationally recognised researchers. The students learn skills relating to data analysis and the communication of scientific ideas via oral presentations and a written thesis. The Bachelor of Medical Science (Honours) program offers candidates a range of projects across an array of research streams, matching student interests to projects respectively.

MAPrc offers BMedSci students a broad array of research projects to choose from.





# HDR & HONOURS STUDENT SUPERVISION

## Post-Graduate Research

Monash Alfred Psychiatry research centre (MAPrc) has a long track record of producing world class research with direct clinical translation. The key goal of MAPrc is to conduct research aimed at developing new treatment avenues and new understanding with direct, effective, and immediate applications. Our research covers all ages across the lifespan and many different mental illnesses. We have a multidisciplinary team of researchers with diverse methodological skills who supervise research projects in the fields of clinical psychiatry, psychology, biology, and health technologies.

**Our student supervisor team continues to identify opportunities to improve students' learning experience. We strive to create a warm, interactive space in which students can be challenged, learn, and discover.**

### MAPrc supervisors

#### Prof Jayashri Kulkarni

Director MAPrc, Head of Department Psychiatry – Central

#### Dr Caroline Gurvich

Deputy Director MAPrc & Head, Cognition and Hormones

#### Dr Gemma Sharp

Research Fellow, Head, Body Image Unit

#### Dr Natalie Thomas

Research Fellow, CCS Student Neuroscience Co-Coordinator

#### Dr Elizabeth Thomas

Post-Doctoral Researcher

### ECIMH supervisors

#### Prof Paul Fitzgerald

Director ECIMH

#### A/Prof Kate Hoy

Deputy Director ECIMH

#### Dr Bernadette Fitzgibbon

Senior Research Fellow

#### Dr Neil Bailey

Research Fellow

#### Dr Sally Herring

Research Fellow



## Teaching (continued)

### Bachelor of Medical Science (Honours)

The Monash University Bachelor of Medical Science (Honours) is a twelve-month degree for MBBS students. The program introduces students to research practice in a research setting with nationally and internationally recognised researchers.

The students learn skills relating to data analysis and research critique and the communication of scientific ideas via oral presentations and a written thesis. The Bachelor of Medical Science (Honours) program offers candidates a range of projects across an array of research streams, matching student interests to projects respectively.

**MAPrc offers BMedSci students a broad array of research projects to choose from, and opportunities to observe clinical management in the Women's Mental Health Clinic, a specialist clinic for women with a variety of psychiatric disorders with a strong focus on hormonal changes and other reproductive factors.**

### Bachelor of Science and Bachelor of Biomedical Science (Honours)

The Bachelor of Science and Bachelor of Biomedical Science (Honours) at Monash University is a twelve-month prestigious program of coursework and research in science and biomedical science for high achieving students who have completed relevant undergraduate degrees.

Training in areas of research methodology will be provided in conjunction with carrying out an independent research project, working closely with a supervisor who will provide guidance and academic counselling. Completing honours demonstrates advanced research, analytical and communication skills enhancing employability outcomes, and offers a pathway to higher degree research in science.

**Being a multidisciplinary research institute, MAPrc offers a broad array of research projects to choose from including clinical, psychological, biological and health technology research.**

### Doctor of Philosophy (PhD)

Monash University has a proud tradition of research excellence and is committed to providing the highest quality of graduate research education. The PhD program offered at Monash Alfred Psychiatry research centre within the Central Clinical School at Monash University is a 3-4 years (full time) or 6-8 years part-time programme and consists of an extensive, independent research project on an agreed topic, supported by a minimum of two expert academic supervisors. Professional development activities and coursework further enhance the experience required to make an impact in academia, industry, policy, and the wider community.

The studies completed during the PhD program result in a research thesis and peer-reviewed publications, making for a valuable contribution to the current body of knowledge.

Diverse opportunities exist for clinician-scientists and research-only scientists within the field of Psychiatry. Our team of multi-disciplinary researchers will provide supervision and guidance allowing successful independent research to be carried out.





## 2019 HDR and Honours Research Areas

### Menopause, depression and cognition

Investigating the link between early life trauma, stress sensitivity, and perimenopausal depression.

*Methods used: clinical scales, ocular eye-tracking technologies for sensitive measure of cognition, cognitive tasks, biological assays*

### Trauma and psychopathology

Investigating Borderline personality disorder (also known as complex-PTSD) symptomatology, emotion regulation, and trauma history

How childhood trauma impacts adult cognition and emotion regulation

### Hormones and the mind

Mood, cognition, trauma, and behaviour across the menstrual cycle – healthy women, PMS/PMDD, chronic physical illness.

*Methods used: clinical scales, cognitive tasks, biological assays*

### Perinatal Psychiatry

Investigating the link between antipsychotic medications and mother and baby outcomes

### Body Image and Related Disorders

Effects of media/sociocultural factors on body image related disorders

Online interventions using artificial intelligence to prevent and treat body image related disorders

### Neural excitation/inhibition and mental illness

- Electroencephalography
- Biomarker prediction of mental illness

### Mindfulness and the Attention Blink Phenomena

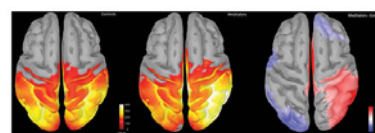
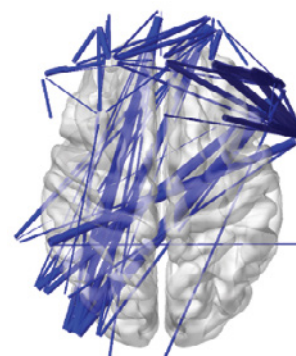
- Electroencephalography
- Neural mechanisms of action

### Mindfulness and the awareness of errors

- Mindfulness Meditation
- Electroencephalography
- Meta-analysis

### Mindfulness and Mental Health in University Students

- Mindfulness Meditation
- Mental Health Interventions



## Teaching (continued)

### Extra-Curricular Activities



*2019 Honours and HDR students representing MAPrc at the annual In Her Shoes Conference. Students are provided opportunities to attend conferences, be on organising committees, and give presentations to the clinical community.*



*PhD Student Paige Gray speaking on her Honours research at the 2019 Students of Brain Research (SOBR) symposium. SOBR is a social and academic network designed to connect brain research students across Victoria.*



*2019 Honours and HDR students having fun at the Annual MAPrc Christmas Party!*



# ABOUT MAPrc

The Monash Alfred Psychiatry Research Centre (MAPrc) is a multidisciplinary translational clinical research and academic centre based on St Kilda Road in the heart of Melbourne. MAPrc is a joint centre of Alfred Health, a major public teaching hospital, and Monash University, one of Australia's leading Universities and ranked in the world's top 100 Universities.

Founded in 1994 by Professor Jayashri Kulkarni, the centre has been a constant source of output in the areas of cutting-edge clinical research, innovation in clinical practice, leadership in medical student teaching, excellence in HDR and honours student supervision, and a strong voice of advocacy and understanding for people living with mental illness.

Our research has a focus on world class translational clinical trials and studies that will make a transformative difference to people living with severe mental illness. We have many national and international collaborative partners including consumers & carers, advocacy organisations, biotechnology companies and researchers from a number of diverse fields. Our goal is to improve the lives of people suffering with serious mental health illnesses such as schizophrenia, bipolar affective disorder, complex trauma disorder, major depression and major anxiety disorders. These severe mental illnesses impact hugely on the quality of a sufferer's life, and impose a huge cost on families and on our wider community.

Research at MAPrc is extraordinarily diverse. Our projects include experimental neuroscience studies which are recognised around the world for the breakthrough insights they provide into brain structure and function, in health and illness.

Our research is funded by independent competitive grants and a range of other philanthropic funding bodies. These grants typically provide only a portion of the funds required to fully cover the total cost of each individual research study or trial. Therefore, we also rely on donations, and on our own fund-raising events to ensure that we can continue to undertake valuable and innovative research in our pursuit of improving the outcomes and quality of life of people living with mental illness.

MAPrc's Executive team is supported by our Research Fellows, Clinical Research Assistants, our teaching staff, our post-graduate and under-graduate students, our enthusiastic team of volunteers and our dedicated administrative staff.

It is impossible to adequately cover the full breadth and depth of activities performed by the centre in an annual report but we hope this report can provide you with a flavour and insight into our work and in particular this year into the dedicated and inspirational people who make up our centre.

## MAPrc Vision

**“To make a transformative difference to the lives of people with mental illness.”**

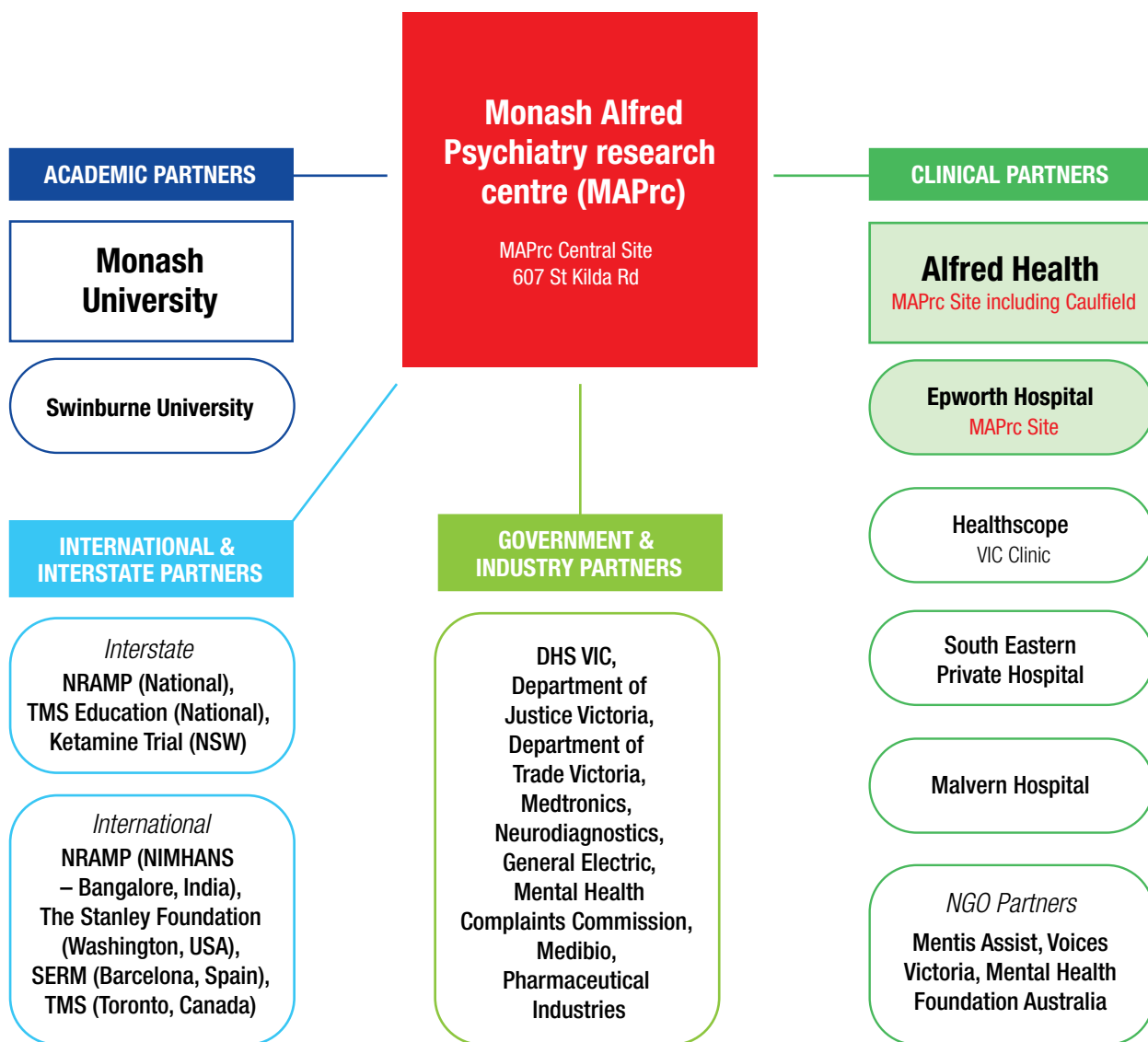
## MAPrc Mission

**“To develop new treatments, new understandings and new services for mental illness.”**

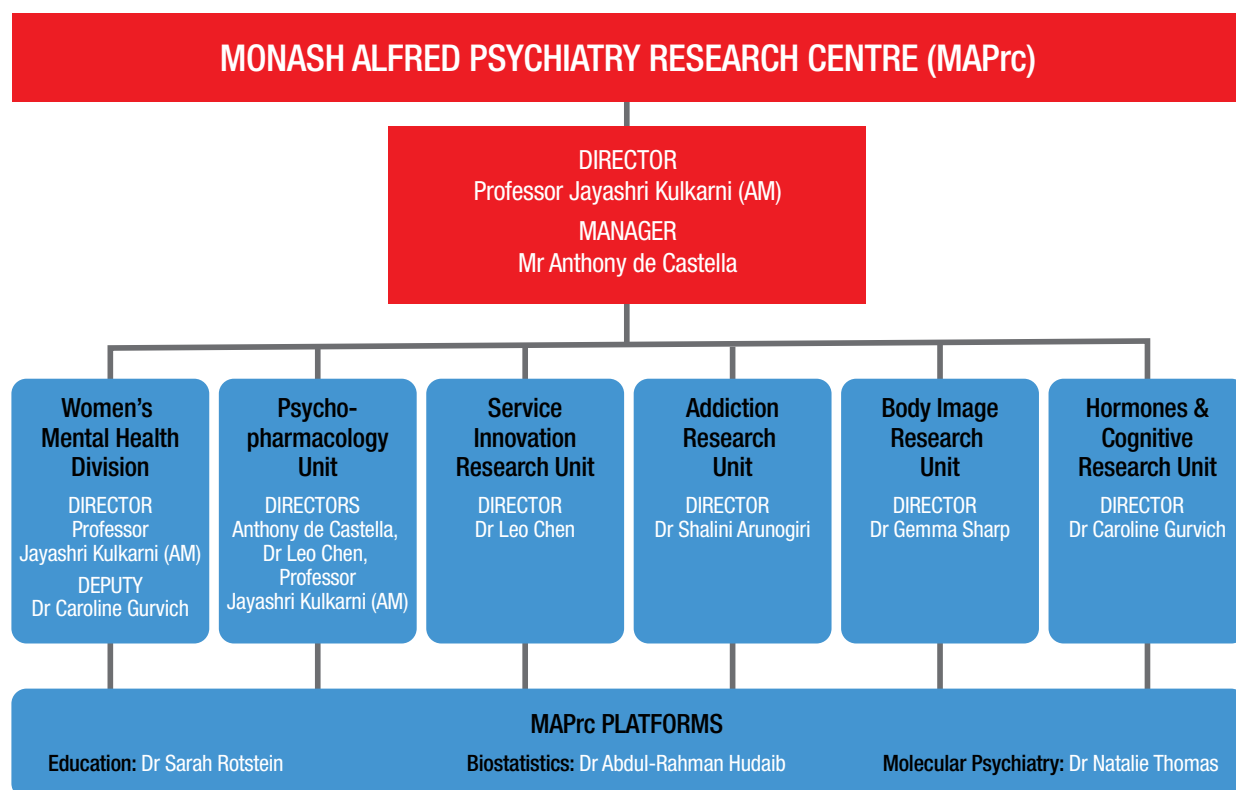
## Our Philosophy

**“To conduct world class psychiatric research with respect, equality and understanding.”**

# OUR PARTNERS



# MAPrc ORGANISATIONAL CHART





# MAPrc DIRECTOR'S REPORT

## Professor Jayashri Kulkarni (AM)



The Foreword to the November 2019 Interim Report of the Royal Commission into Mental Health in Victoria, written by the four Commissioners states 'For too long mental health has been relegated to the shadows within the broader health system. Historical underinvestment and increasing demand mean that services can no longer respond adequately to people living with mental illness, their families and carers. People do not receive the support they need when they need it. Many are left to exist on the margins; many feel unbearably alone and defeated when the right services are not available to them; and some take their own lives.'

The Royal Commission will continue its hearings and hopefully implementation of the recommendations will quickly follow. Reform of the mental health system will no doubt be driven by service providers in collaboration with those who have lived experience – both of actually having an illness, and also of caring for someone with a mental illness. In this way we look forward to operational change – hopefully for the better.

But what about actual content change? How will somebody with schizophrenia, depression, anxiety and other conditions actually get better? Or even cured? This is the critical challenge for mental health researchers to take up and contribute meaningful innovations that actually make a difference to people's lives.

Here at MAPrc, we adopt an integrated model of approach to the complex causes of mental ill health. This holistic 'biopsychosocial' approach informs our research so that we can integrate theories of social determinants with neuroscience to examine new models of treatment for people with mental ill health. Unfortunately, we are witnessing a general decline in interest in neuroscience in Psychiatry research in other research centres and institutions.

The Royal Commission interim report mentions oncology research and holds it up as a model. This is a good model, since the advances in cancer research have been exponential and made by significant biological research advances, which are then combined with personalised, caring service provision.

We should emulate this on a large scale in mental health – but it will require investment in biological psychiatric research, plus collaboration with the many other relevant fields of endeavour. Certainly, at MAPrc, we continue to utilise neuroscientific methodology and the latest brain discoveries, in concert with increasingly sophisticated psychological and social understanding, to deliver new treatments for the mental illnesses that limit people's quality of life in so many profound ways. We hope that the Royal Commission into Mental Health in Victoria will make a real difference in the future to the operational delivery of mental health care as well as an integrated, holistic research-based content of what is delivered.

**Professor Jayashri Kulkarni (AM)**  
Director  
Monash Alfred Psychiatry  
research centre (MAPrc)

# MAPrc MANAGER'S REPORT

## Mr Anthony de Castella



In my 25 years working with the MAPrc team and its previous iterations, we have travelled through a number of significant changes; from Dandenong Hospital to The Alfred in 2020; from the School of Psychological Sciences to Central Clinical School not long after; from our site in the 'Old Baker Building' to our current offices in St Kilda Rd in 2012, and several others. Each change brought with it challenges in terms of resources, facilities, relationships, and organisational politics. But each was also the catalyst for growth and development.

*"If you do not change direction, you may end up where you are heading" – Lao Tzu*

2019 was another, perhaps the most significant, milestone year in terms of changes, most notably the ratification of MAPrc as a Department of Psychiatry within the Central Clinical School, Monash University, the shift of MAPrc from Alfred Psychiatry to Alfred Brain, Alfred Health, the relocation of the Therapeutic Brain Stimulation Division from St Kilda Rd to Epworth Camberwell, and the closure of the Psychogeriatric Clinical Trials team at Caulfield Hospital. Like most change in life and work, they each brought with them both negatives and positives, losses and gains, limitations and opportunities. For many, the critical factor is on which side of these two perspectives we choose to focus. I am extremely grateful to, and applaud the leadership within our Centre / Department, as well all our research and administration staff, students and volunteers, as the challenges and large amount of additional work required to navigate the changes of 2019 were overwhelming done so with a sense of common purpose, positivity and vision for the future.

It is also testament to our dedicated and talented senior researchers, and all who support their vital endeavours, that our outputs and achievements in 2019 were not only consistent with previous years, but included some wonderful accolades. New partnerships were formed with donors and supporters of our work, including the Mohr family who embarked on an important journey with us to develop a potential new treatment for schizophrenia.

The Epworth Centre for Innovation in Mental Health (ECIMH) was formerly launched, and most notably, our fearless leader in Professor Jayashri Kulkarni was rightly acknowledged in the Queen's Birthday honours, for her enormous contributions to her field over many years, most importantly putting women's mental health on the agenda as an area that must be better supported and researched now and in the future.

The future of course will bring yet more change as we continue our mission to develop innovative and new treatments that will improve the capacity, wellbeing, and quality of life of all people living with mental ill health. But, I know that we will continue to embrace each change, focus on each opportunity, and apply ourselves with all our might to make a better future.

**Anthony de Castella**  
Research and Business Manager  
Monash Alfred Psychiatry research  
centre (MAPrc)

## MAPrc RESEARCH

The research conducted at MAPrc in 2019 has a strong focus on Women's Mental Health. Our research consists largely of investigator grant funded clinical trials of neuroendocrine-based investigational products, designed to improve treatments and understanding of Major Depressive Disorders (MDD), Complex Trauma Disorder (CTD), Perimenopausal Depression (PMD), Premenstrual Dysphoric Disorder (PMDD) and other illnesses as they present uniquely in women. Our research utilises various platforms and technologies, including molecular psychiatry, biostatistics, eye tracking, and clinical trials. Our research is founded on the biopsychosocial model and integrated with psychological and neuropsychological testing. Our participants include women, as well as men, from all walks of life and across the lifespan.

Our research is closely entwined with clinical practice, both through our Women's Mental Health Clinic, and also through informing GP's Psychiatrists, and other treating clinicians who either refer patients to us and/or seek the latest research findings to guide their own treatments and interventions.

Along with our focus on women's mental health, MAPrc also conducts industry sponsored clinical trials and service related research. Our honours and HDR students conduct projects in often more broadly related areas of psychiatry and mental health.





## Women's Mental Health Division

The importance of gender differences in aetiology, diagnoses and treatment has traditionally been neglected in psychiatry. The Women's Mental Health Division recognises the complex interaction of biological, psychological and social factors that give rise to clear differences in men and women, and aims to provide gender-tailored novel treatments and interventions.

Principle areas of focus during 2019 included clinical trials to assess novel treatments in borderline personality disorder, schizophrenia, and perimenopause. Expanding current scientific knowledge on the role of the neuroendocrine system in mental illness is critical to these projects.

Exploratory studies of 2019 included exploring potential hormonal and medication treatments for men and women with borderline personality disorder and schizophrenia. NRAMP, the National Register of Antipsychotic Medication in Pregnancy, continued into its 16th year, providing the world's first registry of its kind. This database aims to develop our understanding of the effects of antipsychotic medications taken during pregnancy and the post-natal period.

Alongside research, the team is in a unique position, sitting adjunct to the Women's Mental Health Clinic. This provides an interface of research and clinical practice, ensuring direct translation of the treatments and interventions, developed to ensure real world change.

### WMH Director

**Professor Jayashri Kulkarni (AM)**



*Members of the 2019 Women's Mental Health Division.*

### Senior Researchers

**Dr Caroline Gurvich** Deputy Director

**Emmy Gavrilidis** Research Manager

**Dr Elizabeth Thomas**  
Post-Doctoral Research Fellow

**Dr Natalie Thomas**  
Post-Doctoral Research Fellow

**Dr Caroline Thew** Endocrinologist

**Dr Gemma Sharp**  
NHMRC Early Career Fellow

### Higher Degree Research Students

**Jacqui Riddiford** PhD

**Tanya Gimartin** PhD

**Brad Stolz-Grobusch** PhD

**Dr Carolyn Breadon** PhD

**Dr Sarah Rotstein** PhD

**Ellie Aniulis** PhD

**Marisha Shetty** BMedSci (Hons)

**Nileshni Fernando** BBiomed Sc (Hons)

**Paige Gray** BSci (Hons)

**Amy Hatton** BMedSci (Hons)

**Isabella Cavalieri** BMedSci (Hons)

**Jessica Le** BMedSci (Hons)

**Taran Giddey** BMedSci (Hons)

### Administration

**Rachana Pattali**

WMH Clinic Coordinator

**Dr Katrina McKie**

Short Course Ed Designer

### Research Assistant/Coordinators

**Iris Liang** Research Assistant

**Alisa Turbic** Research Assistant

**Stephanie Greco** Research Assistant

**Steven Steele** Research Nurse

**Dr Fenny Muliadi** Clinical Psychologist

**Alexandra Conway** Research Assistant

### MBBS 5th Year Specialty Students

**Kate Huntinford**

**Angie Xiang**

**Alexandra Sharpe**

**Jack Magner**

**Reshini Eresha**

**Stephanie De Silva**

**Emily Robinson**

**Lana Sturm**

**Dunya Tomic**

**Mary Feng**

**Cameron Naidu**

**Renee Gu Zeng**

**Alexander Rowe**

### Clinical Staff

**Prof Jayashri Kulkarni** Psychiatrist

**Dr Carolyn Breadon** Psychiatrist

**Dr Caroline Thew** Endocrinologist

**Dr Abdul-Rahman Hudaib**

Medical Officer

**Dr Sarah Rotstein**

Psychiatry Registrar

## MAPrc Research (continued)

### Hormones and Cognition Group

Cognitive problems, including difficulties with attention, memory, problem solving and decision making, are a central and problematic feature of many conditions. Cognitive problems are often poorly characterised, poorly understood and poorly treated. The Hormones and Cognition Group is focused on characterising cognition in a range of psychiatric and women's health conditions, with a focus on understanding the link between sex hormones, stress and cognition.

The Hormones and Cognition Group uses traditional neuropsychological testing, combined with eye tracking technology to clearly characterise cognition across diverse mental health and cognitive disorders including schizophrenia, depression and complex trauma disorders, as well as seeking to understand cognitive changes that can occur across the menopause transition. Our Group researches biological and lifestyle factors that contribute to cognitive problems as well as cognitive health.



#### Group Leader

**Dr Caroline Gurvich**

#### Post-Doctoral Researchers

**Dr Natalie Thomas**

**Dr Elizabeth Thomas**

#### PhD Candidates

**Elizabeth Thomas**

**Jacqueline Riddiford**

**Sean Carruthers**  
(Swinburne University)

**Tanya Louise Gilmartin**

**Bradley John Stolz-Grobusch**

#### Honours Students

**Paige Gray**

**Jessica Le**

**Taran Giddey**

**Marisha Shetty**



## Body Image Group

More than 43% of Australians are highly concerned about their body image. Negative body image affects people of all ages, genders and backgrounds, and can lead to risky behaviours such as extreme dieting, excessive exercise, and the pursuit of cosmetic surgery. Negative body image is the strongest risk factor for the development of eating disorders, the deadliest of all mental health conditions. Furthermore, body image concerns have been linked to other mental health conditions including anxiety, depression and substance abuse.

The Body Image Research Group investigates the social and cultural factors which influence the development of body image concerns, with a particular focus on the impact of mass media and social media. We also develop and evaluate novel interventions to treat body image issues and disorders with a focus on the use of innovative technologies such as mobile apps and artificial intelligence-based chatbots.



### Head of Body Image Group

Dr Gemma Sharp

### Post-Doctoral Researcher

Dr Francesca Beilharz

### PhD Candidates

Ms Tanya Gilmartin

Ms Ellie Aniulis

Dr Sarah Rotstein

Bradley Stolz Grobusch

### Master's Degree Candidates

Ms Pascale Maynard

### Honours Students

Ms Nileshni Fernando

Ms Marisha Shetty

### Volunteer

Ms Nileshni Fernando



## MAPrc Research (continued)

### Psychopharmacology Group

The Psychopharmacology Research Team specialises in conducting industry-sponsored clinical trials for new and existing pharmacological treatments in psychiatric conditions. With teams based at St Kilda Road and Caulfield Hospital, in 2019 Professor Jayashri Kulkarni (Adult Psychiatry) and Dr Andrew Gleason (Psychogeriatric), oversaw a large team of researchers, including psychiatrists, medical officers, neuropsychologists, nurses and research assistants/clinical trial coordinators.

In 2019, the Caulfield psychogeriatric trials team confronted some unavoidable circumstances that resulted in the team being deemed to be no longer financially viable. Thus, a large part of the year was spent closing some trials and transferring others to alternate sites. It was a credit to the team working at Caulfield how professionally and smoothly the process was managed. While Alzheimer's disease trials will no longer be conducted at the Caulfield site, Alfred Health continues to conduct trials in this important area through Alfred Brain, under the direction of Professor Terry O'Brian.

After a pause in 2018, our St Kilda Rd site recommenced industry sponsored trials in 2019, taking on two active trials with several others in the pipeline for commencement in 2020. With a focus on adult populations the team will take on industry sponsored trials in the full spectrum of serious mental illnesses, which so urgently need better treatment options. These include; schizophrenia, Major Depression, Borderline Personality Disorder, Bipolar Disorder, and Anxiety Disorders.



**Caulfield Team:** Back row, Jenny Bortoli, Fenny Muliadi, Jenny Ung. Front row, Sue Dal Sasso, Maree Mastwyk.

Like all research conducted at MAPrc, our ethos is to work with trial participants as collaborators and partners in the research process and to only conduct trials where we feel patients will have the opportunity to derive a clinical and personal benefit while, with no risk of harm or detriment. Our goal is to become the premier site in Victoria for clinical trials based on capacity to recruit and ability to complete trials adhering to the highest possible standards of good clinical research practice.

#### Psychopharmacology Team Leaders/ Chief Investigators

**Professor Jayashri Kulkarni**  
(Adult Psychiatry)

**Dr Andrew Gleason** (Psychogeriatric)

**Dr Leo Chen** (Adult Psychiatry)

#### Medical Staff

**Dr Ben Gornall**

**Dr Abdul-Rahman Hudaib**

**Dr Claire Wise**

**Dr Kelly Wright**

#### Team Managers

**Dr Maree Mastwyk**

**Mr Anthony de Castella**

#### Research Staff

**Ms Jenny Bortoli**  
Study Coordinator

**Ms Alex Conway**  
Study Coordinator

**Ms Sue Dal Sasso**  
Study Coordinator

**Ms Stephanie Greco**  
Study Coordinator

**Dr Fenny Muliadi**  
Neuropsychologist

**Ms Jenny Ung**  
Study Coordinator

# MAPrc CLINICS

## Women's Mental Health Clinic

The Women's Mental Health Clinic provides a tertiary medical, psychiatric, and endocrine consultation service and new treatment approaches for women experiencing a range of mental illnesses, including schizophrenia, schizoaffective disorder, bipolar affective disorder, borderline personality disorder, menopause and menstrual-related depression and anxiety.

The clinic operates on the principle of empowerment of our women clients, and we combine physical health examinations with mental health assessments. We also provide an information and education service for the treating clinicians involved with our clients. Importantly, an assessment letter with new management suggestions is sent to the referring doctor and the woman herself, to further her central role in her own management. We also encourage her to bring family members/friends to the consultation so that an education process is undertaken, not only with our client but also with her loved ones.

The Women's Mental Health Clinic is one of a kind, and we take great pride in treating and improving outcomes for women with mental illness. We are proud to make a difference in so many women's lives.



### Director

**Prof Jayashri Kulkarni**  
Psychiatrist

### Deputy Director

**Dr Caroline Thew**  
Endocrinologist

### Clinic Staff

**Dr Gemma Sharp**  
Clinical Psychologist

**Dr Sarah Rotstein**  
Psychiatry Registrar

### Clinic Coordinators

**Cindy Yu**  
Clinic Administrator

**Rachana Pattali**  
Clinic Administrator

**Aileen McInerney**  
Executive Assistant



## MAPrc Clinics (continued)

### Perinatal Psychiatry Clinic

The Perinatal Psychiatry Clinic was launched in 2017 and caters to women with serious mental illness in pregnancy and the postpartum.

We see women with serious mental illness in pregnancy and the post-partum, and offer a pre-conception counselling service for women taking psychotropic medications, to help them choose the safest alternative for their babies. In addition, we offer a secondary consultation service for psychiatrists and general practitioners, where we provide advice about safety of medications and risk management in pregnancy. We also aim to provide ongoing and coordinated care for women with schizophrenia, bipolar disorder, and severe depressive disorder with suicidal ideation or other aspects of risk during their pregnancy, and the first year post-partum.

Our research centre holds the National Register of Antipsychotic Medications in Pregnancy (NRAMP), which we consider to be an important public health initiative. We conduct research on the risks of all psychotropic medications in pregnancy and breastfeeding, and are interested in using our interactions with the women in our clinic to inform research on the risks and challenges faced by women with mental illness in the perinatal period.



#### Clinic Staff

**Prof Jayashri Kulkarni**  
Psychiatrist

**Dr Carolyn Breadon**  
Psychiatrist

#### Clinic Coordinators

**Cindy Yu**  
Clinic Administrator

**Rachana Pattali**  
Clinic Administrator



# MAPrc COURSES & EVENTS

## In Her Shoes Conference on Women's Mental Health 2019

The Monash Alfred Psychiatry Research Centre (MAPrc), together with Servier Pharmaceuticals, hosted its 5th Annual "In her Shoes" Conference on the 14th of September 2019 at the Langham Hotel, Melbourne.

"In her Shoes" is a one-day conference bringing together clinicians and all those who care about women's mental health. The Women's Mental Health Team from MAPrc – opinion leaders and clinicians working in the field – presented the latest research and understanding about the key issues impacting on women's mental health, in an informative, nurturing and inspiring forum.

What is perimenopausal depression? What is the safety of psychotropics in pregnancy? How do I diagnose and manage mental illness in pregnancy and post-partum? What is PMS vs PMDD? Does the pill cause depression? What is the impact of early life trauma? – these are just some of the many questions that were answered at our annual Women's Mental Health conference.

The 2019 conference was attended by over 120 general practitioners, psychiatrists, and other health professionals from all over Australia.



*In Her Shoes*



The 2019 MAPrc "In Her Shoes" team – presenters, facilitators and volunteers.

## MAPrc Courses & Events (continued)

### Women's Mental Health Online Short Course – will launch in 2020

The Women's Mental Health Online Short Course will launch in 2020. The course is designed for general practitioners working with women across the lifespan, and will also be relevant to obstetricians/gynaecologists and psychiatrists. The content draws on the latest in psychoneuroendocrine research, including the extraordinary work of the Monash Alfred Psychiatry Research Centre's Women's Mental Health Division.



## WOMEN'S MENTAL HEALTH SHORT COURSE

Monash Alfred Psychiatry Research Centre



### OVERVIEW

This online short course is designed for general practitioners working with women across the lifespan, but is also relevant to obstetricians/gynaecologists and psychiatrists. The content draws on the latest in psychoneuroendocrine research including the extraordinary work of the Monash Alfred Psychiatry Research Centre's Women's Mental Health Division.

#### ADOLESCENT MODULE

Sections include: complex trauma disorder, premenstrual dysphoric disorder, depression & anxiety, eating disorders, polycystic ovarian syndrome, the oral contraceptive pill and family violence.

#### PERINATAL MODULE

Sections include: antenatal depression & anxiety, post-partum depression, post-partum PTSD, post-partum psychosis and safety of psychotropics in pregnancy.

#### MIDLIFE MODULE

Sections include: perimenopausal depression, menopause & hormone replacement therapy, complex trauma disorder in perimenopause and family violence.

#### AGED MODULE

Sections include: dementia, elder abuse and late life depression & anxiety.



SHE FLIES WITH HER OWN WINGS

ALIS VOLAT PROPRIIS



Monash Alfred Psychiatry research centre



# ABOUT ECIMH

## Revolutionising treatment for mental health

The Epworth Centre for Innovation in Mental Health (ECIMH) is harnessing neuroscience technology to develop a new era of mental health treatment options. Our mission is to transform outcomes for people with disorders of mental health and brain function by developing, advancing and translating brain stimulation and other innovative therapies.

ECIMH is a joint Monash University and Epworth HealthCare multidisciplinary academic clinical research centre, led by Professor Paul Fitzgerald. Based at Epworth Camberwell, the centre is an integral part of Monash University's Central Clinical School's Department of Psychiatry, and Epworth HealthCare's mental health service, Epworth Clinic.

ECIMH encompasses established, diverse and highly innovative researchers, including the senior leadership of ECIMH Deputy Director Associate Professor Kate Hoy, Senior Research Fellow Dr Bernadette Fitzgibbon, Research Fellow Dr Neil Bailey and Research Manager, Dr Sally Herring. The multidisciplinary ECIMH team is comprised of 30 expert and passionate psychiatrists, psychologists, mental health nurses, researchers, engineers and students, dedicated to enhancing mental health outcomes.

Research at ECIMH provides critical hope to people across the community living with mental health and neurological concerns, with 18 clinical and experimental trials running in 2019. These trials provide individuals with ready access to innovative treatment technologies, placing Epworth Clinic at the forefront of mental health research and clinical services.

ECIMH aims to:

- Conduct research of internationally outstanding quality focused on improving clinically relevant outcomes
- Conduct research relevant to and impacting on the clinical services of Epworth
- Provide outstanding training and mentoring
- Be the leading national centre for therapeutic brain stimulation research, education and clinical development.

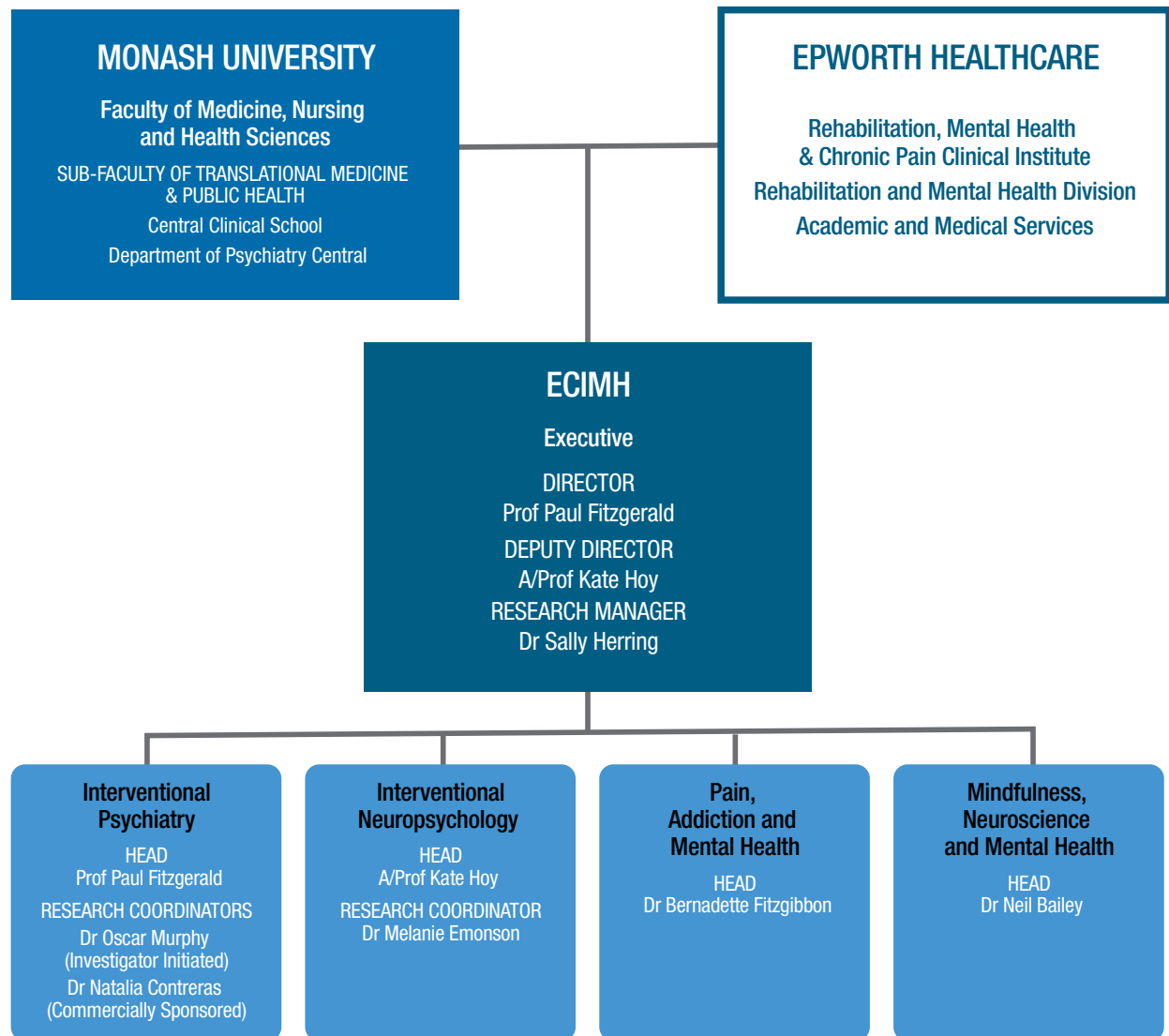
Senior academic researchers within ECIMH lead complementary research groups, focusing on these aims in specific areas of mental health and neurological conditions. The four research groups within ECIMH are:

- Interventional Psychiatry, led by Prof Paul Fitzgerald
- Interventional Neuropsychology, led by A/Prof Kate Hoy
- Pain, Addiction and Mental Health, led by Dr Bernadette Fitzgibbon
- Mindfulness Neuroscience and Mental Health, led by Dr Neil Bailey.





# ECIMH ORGANISATIONAL CHART



Across these four groups, the current focus of ECIMH is to

- Improve transcranial magnetic stimulation (TMS) treatment for depression to make it more personalised, effective and efficient
- Investigate TMS as a new treatment for a variety of other disorders including Alzheimer's, chronic pain and OCD

- Develop and evaluate innovative treatments, such as transcranial Alternating Current Stimulation (tACS) for depression in young people, mild cognitive impairment, and Alzheimer's disease
- Explore other novel medication and non-medication therapies, including mindfulness

- Expand our understanding of the brain and mental illness to guide early diagnosis, personalisation of treatment and development of new treatment options

We are proud of what we have achieved in 2019. In 2020, ECIMH will continue to work towards our vision of transforming therapeutic outcomes for people with disorders of mental health and brain function.

# ECIMH DIRECTOR'S REPORT

## Professor Paul Fitzgerald



In 2019, the Therapeutic Brain Stimulation Division at MAPrc joined ECIMH at the Epworth Camberwell site, merging into a single academic clinical research centre. Trials, staff, students and two labs worth of equipment were transitioned to our newly renovated space at Camberwell. ECIMH now has 30 staff and students, and 18 active trials, including 11 investigator-initiated, commercially sponsored and/or collaborative clinical trials. Another 11 are approaching commencement in 2020.

As part of this move, the TMS research treatment program was established at ECIMH, in collaboration with the Epworth Clinic Mental Health inpatient wards and clinical TMS program. Initially staffed with a rotation of mental health nurses from Epworth Clinic, this treatment program is now staffed by two directly employed ECIMH TMS nurses who share a full-time position. This program provides all the TMS treatment for participants across the clinical trials, and is a vital treatment option for those with Alzheimer's, OCD and Autism spectrum disorders. In another important step, the first mental health inpatient commercially sponsored trial commenced at Epworth Camberwell.

In recognition of this thriving research program and the innovative and outstanding work done in the centre, I was privileged to receive the inaugural Epworth Medical Researcher of the Year of award in November. I see this as a reflection of the extraordinary work that occurs throughout our team.

The Centre was also the recipient of a number of significant philanthropic donations across 2019, specifically supporting the Centre's work in Alzheimer's, and youth depression. This has allowed these two flagship trials to thrive, and hopefully contribute to remote treatment options in populations where access is key. We also experienced considerable success in the Epworth Research grants, with funding awarded for projects in opioid use and chronic pain, post-stroke depression, EEG predictors of depressive relapse, accelerated TBS for depression, virtual reality in the treatment of social cognition in Schizophrenia, an intervention program for carers of people with Alzheimer's, and others. Successful applicants included PhD students, postdoctoral researchers, research fellows and senior research fellows.

A major achievement in 2019 (the result of 20 years of our TMS research and advocacy) was the October announcement by the Medical Services Advisory Committee recommending TMS treatment for depression be funded through Medicare in Australia. This was the 3rd application I have led in the last 10 years aiming to make this important treatment more widely available, and this outcome is based substantially on the results of clinical TMS and depression research conducted by our team. This recommendation is a rare example of the direct translation of mental health research into a new and accessible clinical treatment, and provides much needed hope to those with treatment resistant depression. Although parliamentary and budget approval is still required prior to implementation, this recommendation is an enormous step forward. We, as a centre, are in an excellent position to provide the training and certification for TMS for depression programs, a need that will arise in response to the significant demand following implementation of these recommendations.

As we move towards 2020, I am excited about the upcoming opportunities for ECIMH, and the steps we will continue to make towards our vision of transforming therapeutic outcomes for people with disorders of mental health and brain function, through brain stimulation and other innovative therapies.

**Professor Paul Fitzgerald**  
Director, ECIMH

# ECIMH MANAGER'S REPORT

## Dr Sally Herring



It has been an incredibly exciting year for ECIMH, with a huge number of changes and opportunities. The substantial renovations of the Centre's space at Camberwell was completed, with the generous support of Monash University, Epworth HealthCare and philanthropic donors, allowing for the expansion of the team and research program at this site.

Nine staff, seven students, two labs and 12 trials – eight clinical and four experimental – transitioned across to Camberwell from St Kilda Rd in 2019. This tripled the size of the centre, and expanded the ECIMH mental health research program to include mild cognitive impairment, chronic pain and autism spectrum disorders, along with new trials in Alzheimer's and OCD.

This transition was an exciting and challenging undertaking for all involved. The final renovations created office space at Camberwell for the expanded team, with Paul and Julia's passion for adding greenery helping make it a welcoming and warm part of the hospital. The staff moved to employment under Epworth HealthCare, and took on a whole new not-for-profit organisation. PhD students and honours students relocated their studies to Camberwell, all at various stages of testing, and hit the ground running.

The labs integrated the new and the relocated equipment, and everyone contributed to ensuring the trial protocols could be run in the new area, and getting the expanded research program up and going.

Finally, the transition of the ethics and governance approvals of the trials moving over to Epworth was completed – a process that was long, complex, and ultimately a very successful collaboration between Alfred Ethics & Governance, the Epworth Research Development and Governance Unit, and the researchers involved. Blazing a trail with this transition, ECIMH was able to play a considerable part in the development and uptake of the new research governance structures and SOPs at Epworth.

I would like to acknowledge and thank all the current and transitioning staff and students of ECIMH for their efforts, flexibility and patience while the process took place; every single one contributed to launching the centre into its new phase.

The success of a range of emerging researchers in the 2019 Epworth Research Grants cemented the team at their new site. External grant success and the leadership achievements of both the Director (Epworth Medical Researcher of the Year), and the Deputy Director (elected president of the Australasian Brain Stimulation Society), continued to take ECIMH forward into its new phase, while the MSAC announcement regarding TMS reflected the extensive body of work previously conducted. We are all looking forward to the next phase of the centre; we know it will continue to be exciting, and will continue to innovate treatment in the areas of mental health and neurological conditions for the people who need it most.



# ECIMH RESEARCH

## Interventional Psychiatry



**Professor Paul Fitzgerald**  
Head, Interventional Psychiatry Group

Led by Professor Paul Fitzgerald, research conducted by the Interventional Psychiatry group aims to develop, refine, and innovate brain stimulation techniques and other novel mental health treatments through world-first research and commercialisation. We conduct clinical trials across a range of mental health conditions, including Depression, Anxiety Disorders, Obsessive-Compulsive Disorder, Alzheimer's Disease, and Autism Spectrum Disorders, evaluating the clinical applications of these innovative therapies, improving patient care and offering additional treatment options.

The Interventional Psychiatry group involves both investigator-initiated and commercially sponsored clinical trials, across a broad range of national and international Phase II and Phase III research. The investigator-initiated trials collaborate widely throughout the University and health care sectors, but remain driven by ECIMH principal investigators. The commercially sponsored trials have been conducted with ECIMH as both the lead site and a lead contributing site, offering both inpatient and outpatient treatment options. Inpatient care has been provided in collaboration with the Epworth Clinic mental health inpatient unit, Melbourne Pathology and Slade Pharmacy; an integrated treatment system, embedded within the wider Epworth Mental Health network. This is a unique capability placing us at the forefront of mental health research in Australia.

In addition to our clinical trials, the team is also engaged in studies using advanced neuroscience techniques to try and better understand the underlying brain processes of psychiatric and neurological disorders, and the mechanisms through which brain stimulation may enhance function.

### Head of Interventional Psychiatry

**Professor Paul Fitzgerald**

### Assistant to Professor Fitzgerald

**Julia Scandrett**

### Academic Psychiatrist

**Dr Leo Chen**

### Research Coordinators

**Dr Oscar Murphy**  
(Investigator-Initiated Trials)

**Dr Natalia Contreras**  
(Commercially-Sponsored Trials)

### Research Fellow

**Dr Robin Cash**

### Visiting Research Fellow

**Dr Pakin Kaewpijit**

### Research Nurses

**Weiyu Guan**

**Lisa Hewett**

### Research Officers

**Veronika Simic**

**Rachel Hughes**

**Kate Gunningham**

**Caley Sullivan**

### Research Assistants

**Andrea Marcu**

**Aleksandra Miljevic**

**Gregory Humble**

**Kirsten Gainsford**

**Megan Ross**

### Higher Degree Research Students

**Prabhavi Perera**

**Aleksandra Miljevic**

**Andrea Marcu**

**Robert Cooper**

## ECIMH Research (continued)

### Interventional Neuropsychology



**Associate Professor Kate Hoy**  
**Head, Interventional Neuropsychology Group**

Cognitive impairment is common across a number of mental health conditions, most prominently dementia, and it is highly debilitating. Yet despite billions of dollars and decades of research we have yet to see the development of a single effective treatment across any of these disorders. This represents an extraordinary unmet global need which the Interventional Neuropsychology research group intends to address.

Through the use of advanced neuroscience techniques, we are able to investigate brain function in cognitive disorders and develop innovative treatments. The Interventional Neuropsychology research group conducts research aimed at development and translation of innovative brain stimulation treatments for cognition, through world-first research and commercialisation. We conduct clinical trials in conditions such as Alzheimer's, Mild Cognitive Impairment, and Schizophrenia.

In addition to our clinical trials, we also conduct studies using advanced neuroscience techniques, to try and better understand the underlying brain processes of cognitive disorders and symptoms, and the mechanisms through which brain stimulation may enhance function. This investigative research is conducted in disorders including traumatic brain injury, depression, Huntington's, and anxiety disorders.

#### Head of Interventional Neuropsychology

**Associate Professor Kate Hoy**

#### Research Coordinator/Fellow

**Dr Melanie Emonson**

#### Honours Students

**Georgia Koutsaplis**

#### Research Assistants

**Freya Stockman**

**Bridget Kennedy**

#### Higher Degree Research Students

**Hannah Coyle**

**Marie-Claire Davis**

**Andrea Marcu**

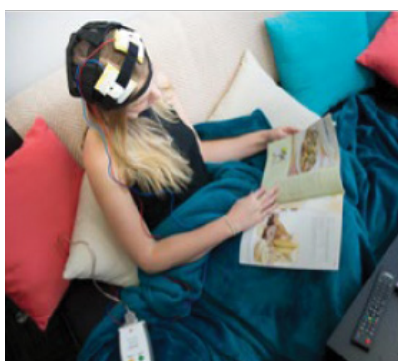
**Kirsten Gainsford**

**Jessica Michael**

**Oscar Murphy**

**Leo Chen**

**Robert Cooper**



## Pain, Addiction and Mental Health



**Dr Bernadette Fitzgibbon**  
*Head, Pain, Addiction and Mental Health Group*

Chronic pain is a significant global health problem affecting 1.5 billion people world-wide. Current treatments are largely ineffective, targeting generic symptoms rather than disease-specific mechanisms, with pharmacological interventions (often opioid-based) being a mainstay approach. The combination of inadequate treatments for chronic pain, as well as the potential for patients to become dependent on pharmaceutical treatments, means there is an urgent need for the development of effective, non-pharmaceutical, and practically accessible novel treatment approaches.

The Pain, Addiction and Mental Health research group led by Dr Bernadette Fitzgibbon is a unique research program dedicated to understanding the neurobiology of pain and the development of novel pain therapeutics. It aims to develop an in-depth understanding of the interplay between physical and mental health, exploring vulnerability and resilience and their impact on brain function and plasticity. With this knowledge, Dr Fitzgibbon's group aims to accelerate the development of new and effective treatments by identifying biological targets that represent the interaction between psychosocial and biological processes in pain disorders.

The Pain, Addiction and Mental Health group's research uses a range of methods, including Theta-Burst Stimulation (TBS), Transcranial Magnetic Stimulation (TMS), transcranial Direct Current Stimulation (tDCS), transcranial Alternating Current Stimulation (tACS), electroencephalogram (EEG), concurrent TMS-EEG, Magnetic Resonance Imaging (MRI), Electrocardiography (ECG) and Galvanic Skin Resistance (GSR), as well as the use of novel at-home brain stimulation adjunctive with psychological therapies.

### Head of Pain, Addiction and Mental Health

**Dr Bernadette Fitzgibbon**

### Visiting Research Fellow

**Dr Julianna Prim**

### Higher Degree Research Students

**Sin-Ki Ng**

**Xianwei Che**

**Michael Wang**

**Jessica Michael**

**Kirsten Gainsford**

**Scott Tagliaferri**  
 (Deakin University)

**Sharmini Kunjan**



## ECIMH Research (continued)

### Mindfulness, Neuroscience and Mental Health



**Dr Neil Bailey**  
*Head, Mindfulness, Neuroscience  
and Mental Health Group*

Mindfulness has grown in popularity over the past 20 years. Large scale studies involving 1000's of teenagers are now testing whether it could be a cost-effective method for improving mental health in schools as a universal intervention. However, many questions remain unanswered. In particular, the mechanisms of action underlying the therapeutic effects are under-researched, and the effective parameters of mindfulness interventions have barely been researched. As such, there is currently no empirical evidence for how much mindfulness practice is required for improved mental health.

The Mindfulness, Neuroscience and Mental Health research group's aim is to use neuroscience to address these uncertainties, in order to improve the effectiveness of mindfulness at improving mental health. The team does this by examining brain activity in experienced mindfulness meditators and comparing this brain activity to healthy control individuals.

In particular, we focus on brain activity related to attention, which has been proposed to be a mechanism of action of mindfulness. This approach tells us how meditation changes the brain. This information can be applied in future research to examine the effect of varying parameters of mindfulness interventions on these mechanisms, and to confirm that alterations in these mechanisms leads to the improved mental health as a result of mindfulness interventions. The team consists of PhD students, honours students, and volunteer interns, and collaborates widely across universities and industry mindfulness providers.

#### **Head of Mindfulness, Neuroscience and Mental Health**

**Dr Neil Bailey**

#### **Higher Degree Research Students**

**Michael Wang**

**Brittany McQueen**

#### **Volunteer Interns**

**Harry Geddes**

# ECIMH COURSES & EVENTS

## ECIMH Training Courses

### Brain Stimulation – Clinical Certification, Clinic Establishment & Research

ECIMH aims to be the leading national centre for therapeutic brain stimulation research, education and clinical development, and to provide outstanding training and mentoring in this field. This core aim is reflected in the development and provision of the internationally recognised program of Brain Stimulation Training courses.

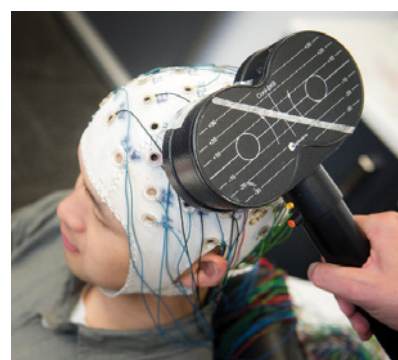
Professor Fitzgerald, Associate Professor Hoy and their team have been providing comprehensive clinical and research training in brain stimulation techniques since 2013. In 2019, the Brain Stimulation training program transitioned to the team's Epworth HealthCare site, and the first two Clinical Certification Courses were held at Camberwell in March and November. This comprehensive and intensive course includes a series of didactic lectures given by experts in the use of TMS for clinical and research purposes, as well as hands-on training and assessment in the technique, over a 2-day workshop.

In 2019 the course material was updated, and TMS staff based at the Epworth became involved in the provision of the training. Despite the relocation of the lab facility during the year, the two courses were conducted with full attendance, with 33 psychiatrists and 32 nurses from clinical services around Australia and

overseas, trained and certified in the clinical provision of TMS. Repeat bookings by health services wanting new staff to be trained is a large component of the attendees, within ongoing enquiries from both clinicians and researchers.

Demand for the courses has been growing, in line with the expansion of TMS treatment services and interest in TMS research. With the Medical Service Advisory Council recommendation for Medicare funding of TMS announced in October, demand for established training programs will only increase. In 2020, ECIMH aims to make the course more widely available through online platforms, and to re-introduce both the nursing refresher course, and the training specifically for researchers wanting to utilise brain stimulation technologies.

[www.tmscourse.com](http://www.tmscourse.com)



## ECIMH Courses & Events (continued)

### ECIMH Events

#### Launch of the Epworth Centre for Innovation in Mental Health

A very successful formal launch of ECIMH was held in October, celebrating the partnership between Epworth and Monash University and Epworth HealthCare, and raising the profile of ECIMH's innovative program of research. The October event marked the completion of the refurbishments to the Centre's area at ECIMH and celebrated the achievement of the move of all staff, studies and equipment to the Epworth Camberwell site.

The launch was attended by Monash University and Epworth executives, including Prof Stephen Jane, Foundation Dean, Sub Faculty of Translational Medicine and Public Health, Epworth CEO Lachlan Henderson, Executive Director Rehabilitation and Mental Health Division, Ms Carolyn Bell, and Academic and Medical Services Executive Director, Dr Luis Prado. The launch was also attended by philanthropic donors, Epworth staff, and community representatives. Past and present MAPrc and ECIMH staff, students, and collaborators were also part of both the celebration, and the congratulations. ECIMH was launched in conjunction with print and radio media coverage of two new trials – tACS for Alzheimer's and tACS for youth depression – and a staff and visitor open day, welcoming the community into the newly refurbished area.

#### Ministerial visit

Minister Dr Katie Allen, member for Higgins and previous medical researcher visited ECIMH in November. With a keen interest in suicide prevention in young people, Dr Katie Allen was invited to come to ECIMH and be introduced to the work in mental health conducted by the research team. Dr Allen and members of her team were provided with a presentation on the tACS for youth depression research, along with a tour of the centre and a meeting with Prof Fitzgerald and senior Epworth staff.





# SENIOR RESEARCHERS

## PROFESSOR JAYASHRI KULKARNI (AM)

MBBS, MPM, PhD, FRANZCP,  
FAHMS

Head of Department,  
Psychiatry Central

Director, MAPrc

Director, Women's Mental Health  
Division



### 2019 Staff

**Dr Caroline Gurvich** Deputy Director,  
Women's Mental Health

**Ms Emmy Gavrilidis** Research  
Manager, Women's Mental Health

**Dr Elizabeth Thomas** Post-Doctoral  
Research Fellow/Acting Manager WMH

**Dr Jasmin Grigg**  
Post-Doctoral Research Fellow

**Dr Natalie Thomas**  
Post-Doctoral Research Fellow

**Dr Gemma Sharp** NH&MRC Early  
Career Research Fellow

**Dr Carolyn Breadon** Academic  
Psychiatrist, PhD Candidate

**Dr Abdul-Rahman Hudaib**  
Research Medical Officer

**Dr Sarah Rotstein**  
Women's Mental Health Registrar

**Dr Caroline Thew** Endocrinologist

**Alexandra Conway** Research Assistant

**Ms Kate Fortune** Research Assistant

**Ms Stephanie Greco**  
Research Assistant

**Ms Iris Liang** Research Assistant

**Dr Katrina McKie** Educational Designer

**Dr Fenny Muliadi**  
Clinical Psychologist

**Ms Rachana Pattali** Women's Mental  
Health Clinic Coordinator

**Steven Steele** Research Nurse

**Ms Alisa Turbic** Research Assistant

### 2019 PhD Students

**Dr Carolyn Breadon** PhD  
*Neuroendocrinology and autoimmune  
triggers for post-partum psychosis*

**Dr Sarah Rotstein** PhD  
*Medical students' stigma against  
psychiatry*

**Ellie Aniulis** PhD  
*Slim Picking: Attentional bias toward  
thin bodies*

**Jacqui Riddiford** PhD  
*Autism, Visual Processing and the  
mirror neuron system*

**Tanya Gilmartin** PhD  
*The relationship between dimensional  
models of personality pathology and  
disordered eating behaviour*

**Brad Stolz-Grobusch** PhD

*Trauma subtypes in Borderline  
Personality Disorder and the impact  
of cognitive dysregulation on emotion  
regulation and treatment response  
during Dialectical Behaviour Therapy:  
The effect of cognitive bias modification*

### 2019 Honours Students

**Marisha Shetty** BMedSci (Hons)

*Stress and the battle of the sexes: Can  
the Perceived Stress Scale measure  
differences in stress responses  
between genders?*

**Nileshni Fernando** BBiomed Sc (Hons)

*Genital Self Image in Adolescents  
– Can an educational intervention  
impact genital body image among  
adolescents?*

**Paige Gray** BSci (Hons)

*Emotion regulation and recognition  
across the menstrual cycle*

**Amy Hatton** BMedSci (Hons)

*Long term outcomes of antipsychotic  
medication in utero*

**Isabella Cavalieri** BMedSci (Hons)

*Management of Aggression in the  
Emergency Department*

**Jessica Le** BMedSci (Hons)

*Cognitive Function Across the  
Menstrual Cycle in Premenstrual  
Dysphoric Disorder*

**Taran Giddey** BMedSci (Hons)

*Peak Saccadic Eye Velocity across the  
Menstrual Cycle*

### 2019 MBBS 5th Year Specialty Students

**Stephanie De Silva**

**Reshini Eresha**

**Mary Feng**

**Renee Gu Zeng**

**Kate Huntinford**

**Jack Magner**

**Cameron Naidu**

**Emily Robinson**

**Alexander Robert Rowe**

**Alexandra Sharpe**

**Lana Janice Sturm**

**Dunya Tomic**

**Angie Xiang**

## 2019 Grants & Awards

- >2 million National Health and Medical Research Council (NHMRC) Investigator Leadership Grant – Innovating Women's Mental Health awarded in 2019 (2020–2024)
- \$196,000 Praxis Precision Medicines Aus Pty Ltd A Phase 2 Clinical Trial of PRAX-114 to Assess the Safety, Tolerability, Pharmacokinetics, and Efficacy in Participants with Major Depressive Disorder awarded in 2019 (2019–2020)
- \$683,748 from Stanley Medical Research Institute for the project titled 'Bazedoxifene – A New Selective Estrogen Receptor Modulator Treatment for people with schizophrenia (2018–2021)
- \$850,284 from SWISSE: Supporting Women in Menopause (SWIM Study) (2018–2020)
- \$196,142 from the Helen Macpherson Smith Trust: An innovative holistic approach to women's mental health in rural and regional Victoria (2018–2021)
- \$993,067 from National Health and Medical Research Council for project grant titled: A randomised controlled trial of NMDA antagonist, memantine, for the treatment of borderline personality disorder (2017–2019)
- \$300,000 from Alfred Felton Bequest for the project 'Preventing suicide in perimenopausal women: a new approach' (2018–2021)
- \$312,000 from The Trustees of The Alison Wolinski Foundation for the establishment and support of The Alison Project (2017–2022)
- \$300,000 from Equity Trustees for Preventing Suicide in Perimenopausal Women: A New Approach
- \$90,000 from Monash Partners & Equity Trustees Partnership for New Approaches for Perimenopausal Depression (2017–2019)
- \$100,000 from Janssen for the National Registry of Antipsychotic Medication during Pregnancy NRAMP (2017–2019)

## About Jayashri

Jayashri Kulkarni was appointed Professor of Psychiatry at The Alfred and Monash University in 2002. She founded and directs a large psychiatric research group, the Monash Alfred Psychiatry Research Centre (MAPrc), which expanded from 25 personnel in 2002 to over 100 staff and students in 2019, covering several different research streams, and conducting over 100 clinical trials. In 2019, Professor Kulkarni was awarded an Order of Australia for her service to Psychiatry. Professor Kulkarni obtained a prestigious Level 3 NHMRC Investigator Grant to conduct research in Women's Mental Health, further enabling her research from 2020 beginning to 2024 end.

Professor Kulkarni graduated from The Monash School of Medicine in Melbourne Australia. She initially worked in emergency medicine and then decided to become a psychiatrist. She became a Fellow of the Royal Australian and New Zealand College of Psychiatrists in 1989 and was awarded a PhD from Monash University in 1997 for her thesis Women and Psychosis. Professor Kulkarni became a Fellow of the prestigious Australian Academy of Health and Medical Sciences in 2016.

She has won numerous awards and accolades for her work with mental health patients. Of note, Women's Mental Health is Professor Kulkarni's major area of interest and research. She was elected President of the International Association for Women's Mental Health in 2017 – an important role that she will have until March 2019. In 2015, she founded the Australian Consortium for Women's Mental Health. She has worked in the field of women's mental health for 25 years and has improved the quality of care for women with mental illnesses by developing specific treatments that are tailored to suit women's needs biologically, socially and psychologically. Her work has been published in many national and international peer-reviewed

publications. To date, Professor Kulkarni has authored in excess of 200 papers, 23 book chapters and 40 other publications.

As a psychiatrist, Professor Kulkarni has extensive clinical experience in many broad areas of practice. She has also trained in many research areas including psychoneuroendocrinology, clinical trials, and psychopharmacology, and is currently working in the area of the neuroscience impacts of early life trauma.

Professor Kulkarni is a well-known public speaker and has a great deal of experience with the media. She has been a regular presenter on ABC radio and has contributed to many other talkback radio programs as well as appearing on television programs such as the Insight series on SBS, and ABC 7.30 report. She is also a highly sought-after presenter having been invited to deliver keynote addresses at many international meetings and conferences in Australia and around the world.



**Professor Kulkarni and The Governor of Victoria at the Order of Australia Ceremony September 2019**

## Overview Research Areas and Strategic Goals

Jayashri has won numerous awards and accolades for her work with mental health patients. Of note, Women's Mental Health is Professor Kulkarni's major area of interest and research. She was elected President of the International Association for Women's Mental Health in 2017 – an important role that she will have until March 2019. In 2015, she founded the Australian Consortium for Women's Mental Health. She has worked in the field of women's mental health for 25 years and has improved the quality of care for women with mental illnesses by developing specific treatments that are tailored to suit women's needs biologically, socially and psychologically. Her work has been published in many national and international peer-reviewed publications. To date, Professor Kulkarni has authored in excess of 200 papers, 23 book chapters and 40 other publications.

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## Featured Projects

**The Alison Project: A randomised double-blind placebo controlled investigation of adjunctive memantine in the treatment of symptoms of complex trauma disorder**

**Investigators:** Kulkarni J, Thomas N, Hudaib A, Gavrilidis E, Gurvich C.

**Funding:** Alison Wolinski Foundation

**Duration:** 2017–2023

**Background:** Complex Trauma Disorder (CTD) is a serious, highly prevalent, stigmatised mental illness with no established biological understanding or effective treatment. Women with CTD have experienced trauma in their childhood or adolescence. The trauma can be emotional, physical or sexual abuse. As adults, sufferers of CTD experience severe interpersonal stress, frequent suicidal thoughts, mood instability, impulsivity and stress-related dissociation. Women with CTD are subject to high mortality and morbidity, and are frequent users of health services. Suicide risk is extremely high in this population; at least 75% of individuals with CTD attempt suicide, and 10% complete suicide. With suicide rates in this patient population alarmingly high and on the upward trend, clinical research that can be translated into practice quickly is imperative.

The poor knowledge about this condition and lack of tailored medications often lead to sufferers being prescribed many different medications, each with significant side effects. These difficulties contribute to the intense stigma that sufferers encounter in the community, and even in the hospital setting. CTD is far more complex than someone having a 'difficult' personality, and effective treatment and support is profoundly poor.

Thus, a new and effective approach for this condition is vital for young women, their families and the broader community. Current psychological treatments are expensive and difficult for CTD patients to access, while there is no clearly designated pharmacotherapy.

Despite the high prevalence, economic impost and individual suffering, biological research in CTD remains in its infancy. A new approach with a new treatment option is urgently needed. A way forward is to view cognitive disturbance in CTD as underpinning all of the key symptoms including emotional instability, aggression, impulsivity, dissociation, as well memory and learning impairments. The glutamatergic system, in particular, the N-methyl-D-aspartic acid (NMDA) subtype receptor, is increasingly recognised for its role in CTD, with recent neurobiological research linking NMDA neurotransmission dysfunction (overactivity) to CTD symptomatology. Memantine is a NMDA antagonist that has been used to improve cognition in Alzheimer's disease.

**Aims:** The Alison Project investigates the use of memantine 20mg (compared to placebo) in women with CTD and aims to improve symptom severity using validated and sensitive measures.

**Method/Design:** The Alison Project is spread over two phases: Phase 1 of The Alison Project started in April 2017 and is a 'Proof of Concept' Pilot that examines the study design and procedures as well as preliminary data collected in order to ensure the best measures are used to test for improvements in CTD symptoms and that the study is feasible. Phase 2 will expand recruitment and address the question of whether memantine improves cognition, mood, quality of life and immunological biological inflammatory factors.



## Senior Researchers (continued)

Phase 1 of the study was an 8-week double-blind placebo-controlled trial of adjunctive memantine was conducted. Sixteen participants received oral placebo while 17 participants received 10mg daily oral memantine for 7 days, with subsequent titration to 20mg daily oral memantine. Eligibility criteria included men and women aged between 16–65 years, with a diagnosis of BPD according to the Diagnostic Interview for Borderline patients. Primary outcome measures included the Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD) assessed fortnightly. Secondary measures included an adverse effect questionnaire, administered fortnightly to assess adverse events known to be related to memantine use. Phase 2 is currently underway.

**Status/Interim Results:** According to intention-to-treat, latent growth curve analyses, a significant change in total score of ZAN-BPD symptom severity was observed in the memantine group at 20mg/daily across time, compared to placebo ( $p = 0.02$ ). No adverse events were significantly more frequent among participants receiving active memantine than among those receiving placebo. Memantine at a 20mg daily dose is a well-tolerated drug that can improve BPD symptomatology and may be a promising novel therapeutic for its treatment. Further studies are needed to explore the efficacy of memantine versus placebo, as well as in comparison to other potential treatments for BPD.

### **Bazedoxifene Treatment for Schizophrenia in Men and Women**

**Investigators:** Kulkarni J, Sundram S, Gurvich C, Hill R, Thomas N. Chu S, Hudaib A, Gavrilidis E.

**Sites:** Monash Alfred psychiatry Research Centre and Monash Health

**Funding:** Stanley Medical Research Institute/The Mohr Foundation

**Duration:** 2019–2021 (SMRI) and 2019–2028 (Mohr)

**Background:** Increasing evidence points to the protective role of estrogen in the brain, and for its positive effects on the symptoms of schizophrenia and schizoaffective disorder. However, adverse effects on breast and uterine tissue in females, and feminisation of males, limit therapeutic use of estrogen in this population. Bazedoxifene is a new hormone treatment that belongs to a group of medications called Selective Estrogen Receptor Modulators (SERMs). Bazedoxifene is thought to have positive estrogenic effects in the brain with little estrogenic side effects, thus offering a longer term treatment approach.

Although more commonly associated with women, estrogen is also a naturally occurring hormone in the bodies of men, and is already used clinically to reverse bone loss, enhance cardiovascular function, and treat prostate cancer. The advantage of using Bazedoxifene instead of estrogen in men is that the beneficial effects of estrogen can be experienced in the brain without the feminising side effects typically associated with hormone treatments.

**Aims:** To study the effect of adjunctive Bazedoxifene 40mg daily over 12 weeks in a double blind, placebo-controlled adjunctive study in the treatment of men and women with schizophrenia. All patients receive standardized antipsychotic medication.

**Method/Design:** This clinical trial investigates the use of a third generation Selective Estrogen Receptor Modulator – Bazedoxifene 40mg in men and women with schizophrenia. This project will recruit and randomise 100 male participants and 160 women with schizophrenia to either daily bazedoxifene 40mg or placebo over the 12-week trial with fortnightly assessments.

Utilising molecular biology techniques with blood samples obtained from participants in the clinical trial described above, we will study changes in neurobiological substrates that we hope will lead to the development of biomarkers or actual tests to enable the accurate, objective and early diagnosis of schizophrenia in the future. We will assess cognitive skills in detail with advanced neuropsychological tests and also use state-of-the-art eye movement tests to better understand the cause of cognitive impairment in schizophrenia. The effect of bazedoxifene treatment on neuropsychological markers will also be measured and inform future treatment innovations.

## New Treatment for Depression in Perimenopausal Women

**Investigators:** Kulkarni J.

**Funding:** Equity Trustees

**Duration:** 2017–2020

**Background:** Aside from the physical changes experienced by women during the perimenopause phase, some women also experience severe mood symptoms for the first time in their life, with no past psychiatric history. The term “perimenopausal depression” denotes the onset, or relapse of depression coinciding with the onset of reproductive hormone changes. Many women with perimenopausal depression experience serious and long-term debilitating symptoms.

Traditional approaches for the management of major depression including the use of antidepressants such as selective serotonin reuptake inhibitors (SSRIs) and Serotonin Norepinephrine Reuptake Inhibitors (SNRI) as the first line response. However, standard treatment of perimenopausal depression using antidepressants has only shown small improvements at best and at worst, is associated with severe side effects. A causal factor in perimenopausal treatment resistant depression may be the lack of stable levels of circulating estrogen acting as a natural augmenter of antidepressants.

Thus, with growing evidence supporting the use of hormone replacement therapy (HRT) as a viable and improved treatment for perimenopausal depression, we are conducting a preliminary investigation of the potential of bazedoxifene (20mg daily) + conjugated estrogen (0.30mg daily), to ameliorate peri-menopausal depression either alone, or in addition to treatment with SSRIs and SNRIs.

**Aims:** To investigate the use of daily bazedoxifene (20mg) + conjugated estrogen (0.30mg) compared with placebo in perimenopausal women with depression in regards to depressive symptomatology. The secondary aims remain exploratory and it is hypothesized that i) there will be differences between eye-tracking assessments taken at baseline and following the sixth/final visit of the trial between the Bazedoxifene and placebo groups. Further exploratory analyses will be conducted on eye-tracking assessments to explore potential predictors of treatment response.

**Method/Design:** This project will recruit and randomise 90 female participants with perimenopausal depression to either daily bazedoxifene (20mg) + conjugated estrogen (0.30mg) or placebo over the 12 week trial with fortnightly assessments. It is hypothesized that women receiving bazedoxifene plus conjugated estrogen, will have significantly greater improvement in depressive symptoms compared with women receiving placebo. It is also hypothesized that there will be group differences between the cognitive profiles of menopausal women who are experiencing depressive symptomatology as compared to menopausal women who are not experiencing significant depressive symptomatology.

## Senior Researchers (continued)

### PROFESSOR PAUL FITZGERALD

MBBS, FRANZCP, MPM, PhD

Professor of Psychiatry

Director, Epworth Centre For  
Innovation in Mental Health (ECIMH)

Head, Interventional Psychiatry



### 2019 Staff

**Ms Julia Scandrett** Personal  
Assistant to Prof Fitzgerald ECIMH

**Associate Professor, Kate Hoy**  
Deputy Director, ECIMH – Head,  
Interventional Neuropsychology

**Dr Sally Herring**  
Research Manager ECIMH

**Dr Bernadette Fitzgibbon**  
Senior Research Fellow – Head, Pain,  
Addiction and Mental Health Group

**Dr Leo Chen** Academic Psychiatrist  
(PhD Candidate)

**Dr Manreena Kaur** NHMRC Early  
Career Research Fellow

**Dr Neil Bailey** Senior Research Fellow  
– Head Mindfulness, Neuroscience,  
and Mental Health

**Dr Karyn Richardson**  
Research Coordinator

**Dr Melanie Emonson**  
Clinical Research Fellow –  
Interventional Neuropsychology

**Dr Natalia Contreras Granifo**  
Clinical Research Fellow –  
Interventional Psychiatry

**Dr Pakin Kaewpijit**  
Research Fellow – Visiting Academic

**Dr Oscar Murphy**  
Post-Doctoral Research Fellow  
(Clinical) – Interventional Psychiatry

**Ms Weiyu Guan**  
Research Nurse ECIMH

**Ms Linda Pearce**  
Research Nurse ECIMH

**Ms Lisa Hewitt**  
Research Nurse ECIMH

**Ms Kirsten Gainsford**  
Research Assistant

**Mr Greg Humble** Research Assistant

**Ms Andrea Marcu** Research Assistant

**Ms Aleksandra Miljevic**  
Research Assistant

**Ms Megan Ross** Research Assistant

**Ms Rachel Hughes** Research Officer

**Ms Kate Gunningham**  
Research Officer

**Mr Caley Sullivan**  
Research Officer – Technology

**Ms Veronika Simic** Research Officer –  
Project Management & Development

### 2019 Students

**Kirsten Gainsford** PhD Candidate

*Transforming treatments for  
schizophrenia: Virtual reality, brain  
stimulation and social cognition*

**Hannah Coyle** DPsych in Clinical  
Neuropsychology

*The relationship between cortical  
activity and cognitive function after  
traumatic brain injury*

**Marie-Claire Davis** PhD Candidate

*Transcranial alternating current  
stimulation for apathy in Huntington's  
disease*

**Robert Cooper** PhD Candidate

*Effects of frequency on enhancement  
& modulation of neural oscillations  
using brief transcranial alternating  
current stimulation (tACS)*

**Andrea Marcu** PhD Candidate

*Investigating EEG correlates of  
attention in ADHD, healthy controls  
and meditators*

**Aleksandra Miljevic** PhD Candidate

*Associations between individual  
differences, rTMS-induced brain  
changes and relapse in depression*

**Sin Ki** PhD Candidate

*Investigating the role of cognitive risk  
factors and underlying neurobiological  
processes associated with chronic low  
back pain*

**Michael Wang** PhD Candidate

*Mindfulness and Pain; mechanism's,  
limitations and innovative tools to  
enhance mindfulness practice among  
chronic pain populations*

**Jessica Michael** PhD Candidate

*Investigating brain correlates of  
anxiety using electroencephalogram  
and transcranial alternating current  
stimulation (tACS)*

**Prabhavi Perera** PhD Candidate

*Therapeutic use of transcranial  
Alternating Current Stimulation (tACS)  
for Obsessive-Compulsive Disorder  
(OCD)*

**Gregory Humble** Honours 2019

**Georgia Koutsaplis** Honours 2019



## 2019 Awards

Epworth Healthcare Researcher of the Year 2019

## 2019 Grants

- \$170,000.00 Impact Philanthropy: Non-invasive brain stimulation as a treatment for Alzheimer's disease July 2019 – July 2021
- \$336,044 Donald Ratcliffe & Phyllis Macleod Trust Fund: Transcranial Alternating Current (tACS) as a treatment for Alzheimer's disease 2019–2021
- \$2,616,498 NHMRC Project Grant: a randomised controlled trial of focal Electrically Administered Seizure Therapy (FEAST) in patients with severe depression 2019
- \$40,000 Arthritis Australia: A double placebo controlled clinical trial of prefrontal theta burst stimulation in Fibromyalgia Syndrome (FMS)

## 2019 Conference Presentations

- Advancing Non-invasive Brain Stimulation for Depression with Personalised Treatment Approaches. International Neuromodulation Society 2019 14th World Congress, 25–30 May 2019, Sydney, Australia. Invited talk
- 3rd International Brain Stimulation Conference, Vancouver, Feb 2019: Symposium presentation: EEG and fMRI network-based predictors of response to rTMS in depression Advancing the use of Brain Stimulation in the Treatment of Neuropsychiatric Disorders. World Psychiatric Association Thematic Congress Melbourne February 2018, Invited presentation

- Advances in brain stimulation treatments for trauma related disorders. Phoenix Australia Centre for Post Traumatic Mental Health National Meeting, Sydney NSW, September 11, 2019
- Fitzgerald PB. Transcranial magnetic stimulation. Epworth HealthCare 2019 Neurological Rehabilitation Symposium, 17 August 2019, Melbourne
- Novel Therapeutic Development for Psychiatric Disorders. Epworth Research Week, 5–9th August 2019; Epworth Camberwell, Victoria – Introduction to TMS and an update on the use of TMS in depression
- TMS in Depression and other Disorder, Peninsula Health Grand Round March 2019

## 2019 Media

- Helmets for the Brain: The Herald Sun Article 29th October 2019
- ECIMH Launch – ABC774 Morning Radio Interview 29th October 2019
- Camberwell's Epworth hospital explores new mental health treatments – Leader Newspaper 6th November 2019

## 2019 Featured Projects

**Developing alternative firstline treatment for young people with depression: a study of Transcranial Alternating Current Stimulation (tACS) (tACS in adolescent depression)**

**Investigators:** Paul B. Fitzgerald, Kate E. Hoy, Manreena Kaur, Neil Bailey, Sally Herring, Kate Gunningham

**Funding:** Perpetual Trustees IMPACT Grant, and philanthropic funding.

**Duration:** 2018–2021

**Background:** This is randomised controlled trial of home-use transcranial alternating current stimulation (tACS) for the treatment of depression in young people (16–30 years). tACS is a gentle non-invasive brain stimulation technique that can alter brain oscillations by delivering delivers a series of small, pulsed, alternating currents to a targeted region of the brain.

**Aims:** This study aims to test the effectiveness of individualised theta and alpha-frequency tACS as treatments for young people with depression.

**Method/Design:** Double-blind, randomised, placebo-controlled trial. One hundred and five young people with depression will be randomised into 3 groups; theta tACS, alpha tACS or sham stimulation, and will receive 30 treatment sessions over 4 weeks. After adequate training and supervision, participants will be able to self-administer treatment at home with a purpose developed device that maintains the blinding of treatment allocation. Rigorous procedures will be in place to monitor the use and function of the device and fail safes have been inbuilt to the device to ensure participant safety.

Depressive symptoms will be assessed at baseline, mid-point, end-point and 3-month follow-up. Cognitive and EEG assessments will be conducted at baseline, end-point and 3-month follow-up. Participants who received sham will have the opportunity to receive open label active treatment.

**Status:** Recruiting

## Senior Researchers (continued)

### Optimized brain stimulation for treatment of Obsessive-Compulsive Disorder

**Investigators:** Paul B. Fitzgerald, Karyn E. Richardson, Sally E. Herring, Leo Chen

**Funding:** NHMRC Project Grant

**Duration:** 2019–2022

**Background:** Obsessive-Compulsive Disorder (OCD) is a severe mental illness that affects 1–2% of the Australian population. There is currently no cure for OCD and current interventions do not effectively relieve symptoms for many people. The disorder is characterised by marked symptom heterogeneity that map onto distinct alterations in fronto-striatal brain networks activity.

While specific OCD symptoms are likely to correlate more strongly with a given pathway, a diagnosis of OCD is associated with changes in all major fronto-striatal networks. Transcranial magnetic stimulation (TMS) is gaining acceptance as a safe and potentially effective treatment for OCD. With current treatment approaches, the choice of which brain region to be stimulated by TMS is largely decided using trial-and-error. These shortfalls limit the efficacy and reliability of proposed TMS interventions. A way to bypass the arbitrary choice of the frontal cortical region to target using TMS is to stimulate all frontal regions encompassing the three main fronto-striatal pathways affected in OCD. Thus, simultaneous stimulation of the three cortical regions should result in reduced response variability and better efficacy of TMS in alleviating the severity of OCD symptoms. This study combines behavioural analyses, neuroimaging, and a course of TMS provided as an outpatient to individuals with OCD to test this hypothesis.

**Aim:** Provide initial proof-of-concept evidence that an optimised, three-sites TBS regime represents a reliable and effective intervention for OCD.

**Method:** Double-blind, placebo controlled, partial cross over study. 80 individuals diagnosed with OCD will be recruited, with the intention to treat a minimum of 75 individuals with OCD. Participants will receive two, 3-week course of continuous Theta Burst Stimulation, Monday – Friday, separated by a minimum of 3 months.

Participants complete an initial clinical and cognitive assessment, and a baseline imaging session, including a resting-state fMRI (rfMRI) paradigm, a structural MR image (T1), a DTI and a clinical scan. Participants are then be pseudo-randomly assigned to (i) optimised TMS (TMS to the right frontal pole (FP), supplementary motor area (SMA), superior frontal gyrus (SFG)); (ii) non-optimised TMS (stimulation to the right FP alone) or (iii) placebo (sham) stimulation. Both participants and study raters are blind to treatment allocation. Pseudo randomisation will be used to ensure that participants across the three groups are match on age, gender, handedness, IQ and baseline clinical OCD severity score. Following the treatment course, participants will repeat the imaging session and clinical assessment. A minimum of 3 months later, participants will cross over to an alternate treatment group. A clinical and imaging session will also be conducted at the beginning and end of this second intervention phase.

**Status:** Recruiting

### PRAXIS: A phase 2 clinical trial of PRAX-114 to assess the safety, tolerability, pharmacokinetics, and efficacy in participants with major depressive disorder

**Investigators:** Paul B. Fitzgerald, Leo Chen; Research Staff: Natalia Contreras, Rachel Hughes, Megan Ross

**Funding:** Commercially Sponsored

**Duration:** 2019–2020

**Background:** This is a clinical trial of PRAX-114 (a small molecule new chemical entity) to assess the safety, tolerability, PK, and efficacy in participants aged 18 to 65 years with moderate to severe Major Depressive Disorder (MDD).

**Aim:** The aim of this trial is to test the hypothesis that augmenting GABAA receptor neurotransmission, following oral administration of PRAX-114, can provide therapeutic benefit to patients with MDD.

**Method:** The clinical trial is comprised of 2 sequential parts:

- Part A: Approximately 12 participants at the ECIMH site (male and female with MDD), 14 daily oral/suspension doses of PRAX-114 up to 60 mg once every night (7 days inpatient, followed by 7 days outpatient). Daily clinical assessments are conducted for the first seven days, followed but 3 follow up visits over 3 weeks.
- Part B: Approximately 12 participants at the ECIMH site (female with perimenopausal MDD), 14 daily oral doses of PRAX-114 up to 60 mg once every day (14 days outpatient). Participants will be assessed on clinical measures approximately 6 times over a 6-week period.

**Status:** Recruiting

## Associate Professor Kate Hoy

BBNSc (Hons), DPsych (Clin Neuro)  
Head, Interventional  
Neuropsychology  
Deputy Director, Epworth Centre for  
Innovation in Mental Health



### 2019 Staff

**Dr Melanie Emonson**

**Ms Freya Stockman**

**Ms Bridget Kennedy**

### 2019 Students

#### Main Supervisors

**Ms Hannah Coyle** DPsych Candidate

*A longitudinal investigation of the pathophysiology, clinical and cognitive symptoms during recovery from mild Traumatic Brain Injury" Commenced 2016*

**Ms Marie-Claire Davis**

PhD Candidate

*Transcranial alternating current stimulation (tACS) for apathy in Huntington's disease. Commenced 2018*

**Ms Andrea Marcu** PhD Candidate

*Understanding attention across the spectrum of ability: from mindfulness to ADHD. Commenced 2018*

**Ms Kirsten Gainsford** PhD Candidate

*Transforming treatments for schizophrenia: Virtual reality, brain stimulation and social cognition. Commenced 2019*

**Ms Jessica Michael** PhD Candidate

*Investigating brain correlates of anxiety using electroencephalogram and transcranial alternating current stimulation. Commenced 2019*

**Ms Georgia Koutsaplis**

Honours Student

*Investigate whether the effects of tDCS on cognition are driven by generalised improvements in information processing. Commenced 2019*

#### Associate Supervisors

**Mr Oscar Murphy** DPsych Candidate

*Investigating the Cognitive and Electrophysiological Effects of Non-Invasive Transcranial Electrical Stimulation in Healthy Individuals and Major Depressive Disorder. Commenced 2014*

**Dr Leo Chen** PhD Candidate

*Improving Efficiency and Efficacy of Repetitive Transcranial Magnetic Stimulation (rTMS) Therapy in Major Depression and Comorbid Anxiety. Commenced 2017*

**Mr Robert Cooper** PhD Candidate

*Investigating the impact of stimulation parameters on the effects of tACS. Commenced 2017*

### 2019 Grants

- CIA, \$170,000 Perpetual IMPACT Philanthropy Program: Non-invasive brain stimulation as a treatment for Alzheimer's disease, 3 years
- CIA, \$336,044 Donation: Donald Ratcliffe and Phyllis Macleod Trust Fund: Remotely supervised tACS for mild Alzheimer's, 3 years
- Senior Investigator, \$28,429 Epworth Research Capacity Building Grant, Epworth HealthCare: Transforming treatments in schizophrenia: virtual reality, brain stimulation and social cognition, 12 months. (CIA Ms Kirsten Gainsford)
- Co-CI, \$29,611 Epworth Research Capacity Building Grant, Epworth HealthCare: Developing a novel brain stimulation treatment for post stroke depression, 12 months (CIA Dr Karyn Richardson)
- Co-CI, \$10,000 Epworth Pilot Research Grant, Epworth HealthCare: Identifying oscillations relevant to chronic low back pain comorbid with chronic opioid use for targeted interventions, 12 months (CIA Dr Bernadette Fitzgibbon)
- Co-CI, \$40,000 Arthritis Australia Project Grant: Theta Burst Stimulation for fibromyalgia, 12 months (CIA Dr Bernadette Fitzgibbon)



## Senior Researchers (continued)

### 2019 Conference Presentations

- Hoy KE. Circuit Therapeutics for the Treatment of Dementia: A Randomised Controlled Trial of Theta Burst Stimulation for Mild to Moderate Alzheimer's Disease. INS 2019 14th World Congress, 25–30 May 2019, Sydney, Australia
- Hoy KE. EMCR Panel for the NHMRC National Institute of Dementia Research, Australian Dementia Forum. 12–14 June 2019, Hobart, Australia (Expert Panellist)
- Hoy KE. Advancing Dementia and Brain Stimulation Research in Australia: Roundtable. Australian Dementia Forum. 12–14 June 2019, Hobart, Australia (Chair)
- Hoy KE. Non-invasive Brain Stimulation for Cognitive Disorders. Epworth Research Week Symposium. Melbourne, 5th August 2019

### About Kate

Associate Professor Kate Hoy is a Clinical Neuropsychologist with 15 years' experience in clinical brain stimulation research. Following her doctorate Kate worked as a Clinical Neuropsychologist conducting cognitive assessments of patients with psychiatric and neurological illnesses. During this time she became increasingly frustrated with the lack of effective treatments for the patients she saw, particularly for those dealing with the devastating consequences of dementia. It was this experience that inspired her to work in research full time in order to develop the treatments she saw were lacking for her patients. Kate is now an emerging leader in clinical research, having been awarded three sequential NHMRC Fellowships, an NHMRC excellence award and a 2017 Victorian Telstra Business Women's Award.

Kate is also a passionate science advocate and currently works with the Australian Academy of Science across a number of national diversity and inclusion initiatives. In 2016 she founded the WomeninBrainStim.com initiative, a database website which has had a positive impact in addressing the extreme gender imbalances at international brain stimulation conferences, as highlighted in Science Careers.

### Overview of Research Areas and Strategic Goals

Cognitive impairment is common across a number of mental health conditions, most prominently dementia, and it is highly debilitating. Yet despite billions of dollars and decades of research we have yet to see the development of a single effective treatment across any of these disorders. This represents an extraordinary unmet global need which A/Prof Kate Hoy's research will seek to address.

She currently leads a number of world-first clinical trials aimed at improving cognition in Alzheimer's, as well preventing dementia in people with mild cognitive impairment. Kate's team is also conducting research looking at cognitive impairment in schizophrenia, head injury and mild cognitive impairment, as well as investigating ways in which to optimise efficacy of prefrontal brain stimulation techniques. She has received over 4.5 million dollars in funding for this research to date and has published over 100 scientific journal articles. Professor Hoy is internationally recognised as a leading brain stimulation researcher. She is on the editorial board of Cortex, has given more than 40 invited presentations on cognition and brain stimulation, and is the current President of the Australasian Brain Stimulation Society.

### 2019 Featured Projects

**A randomized controlled trial of Theta Burst Stimulation for the treatment of cognitive impairment in mild to moderate Alzheimer's disease**

**Investigators:** A/Prof Kate Hoy, Prof Paul Fitzgerald, Dr Andrew Gleason

**Funding:** NHMRC, Mason Foundation, Monash University, State Trustees, Perpetual, Philanthropy

**Duration:** 2016–2020

**Background:** Alzheimer's disease (AD) is the most common type of dementia and is characterised by progressive decline in cognitive functioning. Although there are some approved medications for AD, these provide only limited symptomatic benefit without slowing the disease progress. Alternative, or complementary, treatment approaches are needed. Recent research has indicated that AD appears to target specific large-scale distributed, function-critical neural networks. Indeed the progressive cognitive decline seen in AD has been suggested to be, in part, a result of decreased functional connectivity throughout what is known as the default mode network (DMN), a brain network whose anatomy closely mirrors the pattern of amyloid accumulation and atrophy seen in AD patients. Therefore, a treatment which is able to specifically target the DMN network in order to enhance connectivity, could result in a highly effective therapy for the cognitive impairments in AD. Non-invasive brain stimulation (NIBS) techniques have considerable promise in this regard. NIBS has been shown, to modulate activation throughout large scale cortical networks (such as the DMN), to enhance cognition in a number of disorders and to produce long lasting behavioural effects.

In particular, Theta Burst Stimulation (TBS) is a highly effective form of NIBS which allow for multi-site stimulation within a single treatment session. Therefore, we propose to conduct the first ever double-blind placebo-controlled randomised trial of TBS for the treatment of mild to moderate AD.

**Aims:** The objective of this Phase II trial will be to provide essential information on efficacy, mechanism of action, tolerability and safety, thus providing the basis for the subsequent conduct of a definitive Phase III evaluation

**Method/Design:** A double-blind placebo-controlled clinical trial comparing a treatment course of active TBS to sham TBS consisting of 21 daily treatment sessions over six weeks. In each treatment session TBS will be sequentially provided to four brain regions, the left and right dorsolateral prefrontal cortex (DLPFC, rDLPFC) and the left and right posterior parietal cortex (PPC, rPPC). In addition to clinical outcomes, in order to interrogate our theoretical model, we will assess the impact of TBS on network activity.

**Status:** Trial Currently Recruiting

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#### **Stimulating Change: A longitudinal investigation and clinical trial of brain stimulation in Mild Cognitive Impairment**

**Investigators:** A/Prof Kate Hoy, Dr Caroline Gurvich, Dr Bernadette Fitzgibbon, Dr Neil Bailey, Dr Natalie Thomas, Dr Melanie Emonson, Prof Paul Fitzgerald

**Funding:** NHMRC

**Duration:** 2017–2025

**Background:** There are currently no effective treatments or preventative approaches for dementia which is predicted to become a global epidemic by 2050. Between 2002 and 2012 there were 413 drug trials in Alzheimer's (the most common form of dementia), these trials had a failure rate of 99.6%.

There has also been a number of recent failures of anti-amyloid medications, casting doubt on what was considered to be one of the most promising new medication avenues, and most recently drug companies have withdrawn from development in the area (i.e. Pfizer in 2018). It is essential that novel avenues for dementia prevention and treatment are pursued. A truly innovative approach is required. Stimulating Change is an ambitious research program which aims to generate a new understanding of the both the factors which lead to dementia, and those that prevent further decline, in high risk groups (i.e. Mild Cognitive Impairment [MCI]). The program also aims to develop a novel non-medication biological therapeutic for dementia prevention.

**Aims:** Specifically, the project aims are to:

- Conduct a comprehensive longitudinal investigation of the biopsychosocial factors underlying changes in brain function and cognitive performance in people with MCI, and
- Investigate the efficacy of at-home brain stimulation for the treatment of MCI and prevention of dementia

**Method/Design:** A double-blind placebo-controlled longitudinal clinical trial comparing yearly courses of active gamma-tACS to sham gamma-tACS in 100 people with mild cognitive impairment.

**Status:** Trial Currently Recruiting

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#### **A TMS-EEG study of Cognitive Impairment in Schizophrenia: Effects of a short course of tDCS**

**Investigators:** A/Prof Kate Hoy

**Funding:** NHMRC

**Duration:** 2015–2019

**Background:** Cognitive impairments are a core feature of a number of neurological and psychiatric conditions and can have devastating impacts on daily functioning. In SCZ they are highly prevalent, occurring in greater than 80% of patients.

The main areas affected are attention, working memory and executive function. These impairments have been shown to result in more functional disability than positive or 'psychotic symptoms' (e.g., auditory hallucinations). There is wide acknowledgement that the current therapeutic approach to the cognitive symptoms of SCZ is insufficient. Traditional treatment approaches, namely medication and cognitive training, are limited in their effectiveness and do not target what is known regarding the underlying neurobiology of cognitive dysfunction. There are now several lines of evidence suggesting that the cognitive deficits in SCZ are due to dysfunctional connectivity throughout cognition relevant neural networks, particularly within fronto-parietal networks. This dysfunctional connectivity is thought to result from impairments in neuroplasticity.

Neuroplasticity refers to the brain's ability to change its structure and function in response to the external environment and is considered to be a critical mechanism underlying successful cognitive functioning. One neuroplastic process thought to be particularly crucial for cognition is Long Term Potentiation (LTP), referring to long lasting increases in the strength of communication throughout neural networks in response to patterns of neural firing. LTP has been shown to be involved in multiple cognitive processes throughout the brain including within the dorsolateral prefrontal cortex (DLPFC); an area of the brain extensively implicated in attention, working memory and executive function. While a number of studies have indeed shown SCZ to be associated with impairments in LTP, these have been predominately in the motor cortex and to date LTP has not been investigated in the DLPFC in-vivo with respect to cognitive function.

## Senior Researchers (continued)

Existing clinical research on the neurobiology of cognitive deficits in SCZ has predominately only focussed on assessments of functional connectivity. This will be the first comprehensive multimodal investigation of the neurobiology underlying impaired cognition in SCZ.

**Aims:** To investigate the neurobiology underlying impairment cognition in schizophrenia and to study the effects of a short course of tDCS on both biology and behaviour.

**Method/Design:** 30 patients with schizophrenia and 30 healthy controls will undergo a comprehensive behavioural and biological assessment, including clinical and cognitive interviews, TMS-EEG and EEG assessment. Patients with schizophrenia will then undergo a double blind randomised placebo-controlled clinical trial of 5 anodal tDCS sessions to the DLPFC, with behavioural and biological assessments repeated following the short tDCS treatment course.

**Status:** Study is complete, and publication has been submitted for publication.

### Dr Neil Bailey

PhD

Post-Doctoral Researcher

Head, Mindfulness, Neuroscience and Mental Health

Epworth Centre for Innovation in Mental Health (ECIMH)



### 2019 Students/Volunteers

**Hannah Coyle** PhD Candidate

*Investigating relationships between altered neurophysiology and neuropsychological symptoms during recovery from mild traumatic brain injury (mTBI) (submitted)*

**Michael Wang** PhD Candidate

*Mindfulness and Pain – Mechanisms, Limitations and Innovative tools to enhance mindfulness practice amongst chronic pain populations*

**Aleksandra Miljevic** PhD Candidate

*Associations between individual differences, rTMS-induced brain changes and relapse in depression*

**Magelage (Prabhavi) Perera**

PhD Candidate

*Therapeutic use of transcranial Alternating Current Stimulation for Obsessive Compulsive Disorder*

**Gregory Humble** Honours Student (Bachelor of Science, completed)

*Does regular mindfulness meditation alter neural inhibition/excitation balance? A TMS-EEG investigation*

**Harry Geddes** Volunteer Intern

*Do mindfulness meditators show differences in neural markers of error processing?*

### 2019 Grants & Awards

- McIver S, Evans S, Bailey NW (2019). Meditation and the Brain. Deakin School of Health and Social Development Grant, \$4,991

### 2019 Media

- Interviewed by PsyPost about our research: <https://www.psypost.org/2019/09/experienced-meditators-have-an-altered-pattern-of-brain-activity-during-a-test-of-attention-and-self-control-54380>
- Published a summary of our research on Science Trends: <https://sciencetrends.com/can-we-predict-who-will-respond-to-brain-stimulation-treatment-for-depression/>



## About Neil

Neil completed his PhD in 2013 examining brain changes that result from depression after a traumatic brain injury. Through this research, Neil became aware of the difficulties in treating and preventing mental illness, and began to focus his research on methods to improve treatments and reduce mental illness rates across society.

## Overview Research Areas and Strategic Goals

Neil conducts a range of studies that explore how mental health can be improved. In particular, he examines brain activity differences in individuals who meditate. The goal of this research is to explain the mechanism of action by which meditation leads to improved mental health. His research also assesses measures of brain activity that predict who will respond to a brain stimulation treatment for depression, how brain activity differs between typical depression and depression that commonly follows a traumatic brain injury, and whether online mindfulness is effective at improving mental health. His long-term goal is to build a case for mindfulness meditation in the core curriculums of high schools to improve mental health across society.

## Featured Projects

### Determining the neurobiology of mindfulness: investigating alterations in neural excitation/inhibition balance following regular mindfulness meditation

**Investigators:** Dr Neil Bailey, Dr Kate Hoy

**Funding:** \$15,000 – Alfred Small Health Grant

**Duration:** 2018–2021

**Background:** Mindfulness meditation has been demonstrated to improve mental health and improve attention. However, the neural mechanisms enabling this are under-explored.

**Aims:** Our research aims to use transcranial magnetic stimulation to probe the inhibition/excitation balances of the prefrontal cortex to determine if alterations to this region of the brain are responsible for the improved attentional function in meditators.

**Method/Design:** The study is a cross sectional design comparing 30 meditators to 30 controls.

**Status:** Data collection ongoing

### Examining brain activity differences related to attention in long term meditators

**Investigators:** Dr Neil Bailey, Dr Kate Hoy, Dr Bernadette Fitzgibbon, Dr Sung Chung, Caley Sullivan

**Funding:** \$1,800 – Thinkable.org Award

**Duration:** 2015–2020

**Background:** Mindfulness meditation has been demonstrated to improve mental health and improve attention. However, the exact profile of brain activity that enables these improvements has not been fully characterised.

**Aims:** Our research aims to use multiple attention based cognitive tasks in combination with EEG to determine which particular neural processes related to attention are altered by meditation.

**Method/Design:** The study is a cross sectional design comparing 30 meditators to 30 controls.

**Status:** Study is in preparation for publication. Meditators show neural activity that is distributed more towards the prefrontal cortex in attention related tasks.

### Predicting response to brain stimulation treatment for depression using machine learning

**Investigators:** Dr Neil Bailey, Professor Paul Fitzgerald

**Duration:** 2015–2020

**Background:** Transcranial magnetic stimulation (TMS) is an effective treatment for treatment resistant depression. However, not all participants respond, and treatments are time consuming and expensive.

**Aims:** Our research aimed to determine whether response to TMS could be predicted using data collected at our research centre over the past 6 years, as well as large open sharing datasets from international labs.

**Method/Design:** The studies are longitudinal design obtaining EEG measures at baseline and using machine learning techniques to build a model that predicts from these baseline measures which participants will respond to treatment.

**Status:** Two of the studies were published in 2018 and 2019, demonstrating ~90% prediction accuracy. A large scale replication using an international dataset is currently in review, and further exploration of these large international datasets is planned.

## Senior Researchers (continued)

### Dr Bernadette Fitzgibbon

PhD

Senior Research Fellow

Head – Pain, Addiction and  
Mental Health

Epworth Centre for Innovation  
in Mental Health



### 2019 Students

**Ms Sin-Ki Ng** PhD Candidate

*Investigating the role of cognitive risk factors and underlying neurobiological processes associated with chronic low back pain (Completed 2019)*

**Mr Xianwei Che** PhD Candidate

*Investigating the influence and mechanisms of social support on the experience of pain (Completed 2019)*

**Ms Jessica Michael** PhD Candidate

*Investigating brain correlates of anxiety using electroencephalogram and transcranial alternating current stimulation (Commenced 2019)*

**Mr Michael Wang** PhD Candidate

*Mindfulness and Pain – Mechanisms, Limitations and Innovative tools to enhance mindfulness practice amongst chronic pain populations (Commenced 2019)*

**Ms Kirsten Gainsford** PhD Candidate

*Transforming treatments in schizophrenia: virtual reality, brain stimulation and social cognition (Commenced 2019)*

**Mr Scott Tagliaferri** PhD Candidate,  
Deakin University

*Identifying factors associated with the onset and persistence of low back pain (Commenced 2019)*

**Ms Sharmini Kunjan**

Honours Candidate

*Investigating neuro-cardiac-guided rTMS for the treatment of depression (Completed 2019)*

### 2019 Grants

- Epworth Research Grant. FITZGIBBON, B.M., Hoy, K., Fitzgerald, P.B., Identifying brain activity relevant to chronic low back pain comorbid with chronic opioid use for targeted interventions. \$10,000
- Epworth Research Grant. Gainsford, K., Hoy, K., FITZGIBBON, B.M., Fitzgerald, P.B. Transforming treatments in schizophrenia: virtual reality, brain stimulation and social cognition. \$30,000

- Arthritis Australia National Research Program; Arthritis South Australia Grant funded by Arthritis South Australia. FITZGIBBON, B.M., Hoy, K., Fitzgerald, P.B., Theta Burst Stimulation for Fibromyalgia Syndrome. \$40,000

### 2019 Conference Presentations

- Donaldson P, Enticott P, Albein-Urios M, Kirkovski K, Hoy K, Fitzgibbon B, Elliot D, Wambeek L, Fitzgerald, P. A clinical trial comparing intermittent theta burst stimulation to dorsomedial prefrontal cortex and right temporoparietal junction in autism spectrum disorder. Symposium – Pediatric and Neurodevelopmental Brain Stimulation. Brain Stimulation, 3rd International Brain Stimulation Conference, 24–27 Feb 2019, Vancouver, Canada.
- Students of Brain Research: The Plasticity of Neuroscience in the Digital Age: 2019 Professional Development and Networking Dinner. Panellist. Melbourne, June 14, Melbourne, Australia.
- Non-invasive neuromodulation to understand and treat pain: applications, challenges and new Frontiers. Orygen, Neurobiology Seminar Series, April 2019.
- Non-invasive neuromodulation to treat pain: applications and new Frontiers. Deakin University, Cognitive Neuroscience Seminar Series, Oral presentation: July 2019.
- Non-Invasive neuromodulation for pain disorders: applications and new frontiers; Novel Therapeutic Development for Psychiatric Disorders. Epworth Research Week, 5–9th August 2019; Epworth Camberwell, Victoria.

## 2019 Media

- BBC The Why Factor, The athletes who can endure pain, <https://www.bbc.co.uk/programmes/p06x3fl3>
- British Psychological Society, Research Digest, Heres how long distance runners are different from the rest of us, <https://digest.bps.org.uk/2020/04/22/heres-how-long-distance-runners-are-different-from-the-rest-of-us/>

## About Bernadette

Dr Bernadette Fitzgibbon is a Senior Research Fellow and Head of the Pain, Addiction and Mental Health Group at ECIMH. Her research vision is to develop an in-depth understanding of the interplay between physical and mental health, namely exploring vulnerability and resilience, and their impact on brain function and plasticity. In doing so, she aims to accelerate the development of new and effective treatments by identifying biological targets that represent the interaction between psychosocial and biological processes in pain disorders.

Her research program has been funded by a number of bodies including the National Health and Medical Research Council, the Mason Foundation, Epworth HealthCare and Arthritis Australia. She has published 49 journal articles, and presenting her work at >50 conferences and events including an invited plenary talk at the Australian and New Zealand College of Anaesthetists meeting (2017) and as an invited guest speaker for the Carolina Neurostimulation Conference (2018). She has most recently been invited to give the Tess Cramond lecture for the 2021 Australasian Pain Society meeting in recognition of her achievements. She is the recipient of >10 awards including the 2018 Australasian Brain Stimulation Society Early Career Award, and the prestigious national Bethlehem Griffiths Research Foundation Young Investigator award (2014).

Beyond her academic achievements, Dr Fitzgibbon is dedicated to scientific advocacy. From 2017–2019, she was elected the chair of the Australian Brain Alliance Early-Mid Career Research Network, and became an Executive Member of the Australian Brain Alliance, an initiative of the Australian Academy of Science to bring together strategic brain research across Australia. She is also highly committed to communicating her research to the general community as reflected in her receipt of a 2014 Young Tall Poppy Science Award through the Australian Institute of Policy and Science, and her work covered in New Scientist, The Psychologist, Australasian Science, the Conversation, the Sydney Morning Herald and more. In 2015, she gave an invited public lecture on pain perception for the Australian Academy of Sciences seminar series “Science Stars of Tomorrow”, of which only 10 early- to-mid career researchers were selected from all of Australia.

## Overview of Research Areas and Strategic Goals

Chronic pain is a significant global health problem affecting 1.5 billion people world-wide. Current treatments are largely ineffective, targeting generic symptoms rather than disease-specific mechanisms, with pharmacological interventions (often opioid-based) being a mainstay approach. The combination of inadequate treatments for chronic pain, as well as the potential for patients to become dependent on pharmaceutical treatments, means there is an urgent need for the development of effective, non-pharmaceutical, and practically accessible novel treatment approaches.

Advances in our understanding of the brain basis of pain have identified a common pathophysiological process that can be termed “maladaptive plasticity”. Maladaptive plasticity is the development of unwanted changes in brain function and structure. These changes have been implicated in the development and maintenance of chronic pain, with evidence of their influence in sensory, emotion and cognitive brain regions. These changes give rise to individual pain phenotypes where the expression and experience of pain is the result of the interplay between an individual’s physiological (e.g. motor, sensory, autonomic) and psychological (e.g. emotion, cognition, learning) systems.

Given these individual pain phenotypes, successful treatment will require targeted interventions based on neurophysiological markers tailored to individuals. Non-invasive brain stimulation is the ideal technique for such interventions because a number of well-established protocols can be individualised to restore maladaptive plasticity. This capability to target brain activity associated with particular pathologies via specific stimulation locations, intensities, and frequencies, allows interventions that are tailored to individuals. My research vision is therefore to accelerate the development of therapeutics for pain disorders by advancing our understanding of individual pain phenotypes and the development of effective brain stimulation therapeutics for pain through personalisation.



## Senior Researchers (continued)

### 2019 Featured Projects

#### A Double-Blind Placebo-Controlled Clinical Trial of Prefrontal Theta Burst Stimulation in Fibromyalgia Syndrome (FMS)

**Investigators:** Fitzgibbon, Bernadette (Primary Chief Investigator (PCI)); Hoy, Kate (Chief Investigator (CI)); Fitzgerald, Paul (Chief Investigator (CI))

**Funding:** The Mason Foundation and Arthritis Australia

**Background:** Fibromyalgia and related disorders present a substantial health problem, with current treatments limited in their efficacy and associated with a number of side effects. This study explored for the first time in fibromyalgia a novel non-pharmaceutical intervention, TBS; a non-invasive brain stimulation method. TBS is a powerful new alternative to standard non-invasive brain stimulation methods as it can be applied in a much more time efficient manner and may result in greater clinical benefit. If successful, the application of this method for fibromyalgia may be applicable to related disorders such as Chronic Fatigue Syndrome.

This study aimed to conduct a double-blind, randomized, sham-controlled proof of principle trial to establish the efficacy of a four week course of dorsolateral prefrontal cortex intermittent Theta Burst Stimulation (iTBS) treatment in fibromyalgia. A total of 39 adults with fibromyalgia participated. Those participants allocated into the sham group were offered open-label compassionate treatments following completion of their involvement in the study. Preliminary findings indicate a greater reduction of fatigue in active vs sham iTBS.

While no group difference was observed for pain, a significant reduction was seen in somatosensory gamma-band power in the active vs sham group, increased frontocentral-parietal theta connectivity was observed in the active group, and we saw a trend correlation of increased theta connectivity to decreased gamma. These results suggest a potential effect on pain modulation systems and support further investigation of this method for fibromyalgia.

**Status:** Final analysis underway, publications in preparation.

#### Identifying oscillations relevant to chronic low back pain comorbid with chronic opioid use for targeted interventions

**Investigators:** (Primary Chief Investigator (PCI)); Fitzgerald, Paul (Chief Investigator (CI)) Kate Hoy; Neil Bailey

**Funding:** \$10,000 Epworth Research Pilot Grant

**Background:** This study explores the co-morbidity of chronic opioid use in chronic pain patients. The project aims to identify unique brain activity relevant to chronic low back pain co-morbid with chronic opioid use. Thus, providing critical information on treatment targets that may be applied in future investigations utilising non-invasive brain stimulation. In this single-session study, we are therefore using electroencephalography (EEG) to investigate how brain activity correlates with symptoms of chronic pain and opioid use, as well as response to a reward task (e.g. images of opioids). EEG is a recording of the brain's electrical activity and is a safe, painless and commonly used tool to investigate brain functioning. A total of 90 participants will be recruited: 30 with chronic low back pain and co-morbid opioid use disorder, 30 with chronic low back pain but do not use opioids, and 30 healthy controls.

**Status:** Ethics and governance approval have been obtained – the trial will commence immediately following Dr Fitzgibbon's return from parental leave.

## Dr Caroline Gurvich

B.A/B.Sc (Hons), D.Psych, MAPS, FCCN

Deputy Director, MAPrc

Deputy Director, Women's Mental Health Division

Head, Cognitive Neuroscience Unit



### 2019 Staff

**Dr Natalie Thomas** Research Fellow, Women's Mental Health

**Dr Elizabeth Thomas** Post-Doctoral researcher, Women's Mental Health

### 2019 Students/Volunteers

#### PhD candidates

**Ms Elizabeth Thomas**  
PhD Candidate

*The influence of the glutamatergic system on cognition across the schizotypy/schizophrenia continuum. PhD submitted 2019*

**Mr Sean Carruthers** (Swinburne University) PhD Candidate

*Executive functioning and the muscarinic system in schizophrenia. PhD submitted 2019*

**Ms Jacqueline Riddiford**  
PhD Candidate

*Investigating ocular-motor correlates of abnormal mirror system functioning in autism*

**Ms Tanya Louise Gilmartin**  
PhD Candidate

*Exploring Personality Pathology and Eating Disorder Symptomology among young women*

**Mr Bradley John Stolz-Grobusch**  
PhD Candidate

*Impact of type and timing of childhood trauma on adult cognition and emotion regulation in Borderline Personality Disorder*

#### Honours candidates

**Ms Paige Gray**  
Bachelor of Science Honours

*Emotion regulation and recognition across the menstrual cycle*

**Ms Jessica Le** Bachelor of Medical Science Honours student

*Cognition, menstrual cycle and premenstrual mood disorders*

### Ms Taran Giddey

Bachelor of Medical Science Honours  
*Peak Saccadic Eye Velocity across the Menstrual Cycle*

**Ms Marisha Shetty** Bachelor of Medical Science Honours

*Gender perceptions of stress*

### 2019 Grants & Awards

- Rebecca L Cooper Medical Research Foundation 'The Cognitive deficits in schizophrenia – a neuroendocrine approach to understanding'; sole CI \$100,000 (2019–2021)
- Stanley Medical Research Institute for the project titled 'Bazadoxefine – A New Selective Estrogen Receptor Modulator Treatment for people with schizophrenia; \$683,748; co-investigator (2018–2021)
- Equity Trustees for the project 'New Approaches for perimenopausal depression' (2018–2021) \$90,000; co-investigator
- Trustees of The Alison Wolinski Foundation for the establishment and support of The Alison Project \$312000; co-investigator (2017–2022)
- A Phase 2 Clinical Trial of PRAX-114 to Assess the Safety, Tolerability, Pharmacokinetics, and Efficacy in Participants with Major Depressive Disorder. Kulkarni, J., De Castella, A. & Gurvich, C. 1/06/19 – 31/12/20
- Metabolomic analysis for biomarker discovery in complex PTSD. Thomas, N., Gurvich, C. & Kulkarni, J. 1/04/19 – 1/10/20
- Sex hormones, mood and alcohol use in women: towards a novel treatment target Arunogiri, S., Gurvich, C., Kulkarni, J. & Lubman, D. Monash University – Internal Department Contribution; 23/09/19 – 30/09/20
- The Damian Project; Kulkarni, J., Gurvich, C., De Castella, A. & Thomas, N. The Mohr Family 1/07/19 – 30/06/28

## Senior Researchers (continued)

### About Caroline

Dr Caroline Gurvich is a Senior Research Fellow and a clinical neuropsychologist. She is the Deputy Director of the Women's Mental Health Division at MAPrc and Head of the "Cognition and Hormones".

She has received several awards and grants, including an NHMRC early career training fellowship, co-PI positions on NHMRC project grants, as well as institutional support (including Advancing Women in Research awards and a Monash University Senior Bridging Fellowship). Caroline has >70 peer reviewed publications that include investigative studies, clinical trials and theoretical reviews, with publications in top ranking psychiatry and neuroscience journals, as well as policy related work and broader science communication (e.g. The Conversation). She has also established biodatabanks to further explore biological contributors to cognitive impairments in mental illness. Caroline has a strong history of successful student supervision and mentorship as well as discipline related leadership (e.g. she was Victoria State Editor of the Australian Psychological Society newsletter (2013/14).

Caroline is also passionate about advocating for equity and diversity in STEM. Since 2015, Caroline has been an active member of the Monash Self-Assessment Team for the SAGE Athena Swan Charter and chaired the working group exploring 'flexible working and career breaks'. In 2018, Monash University was successfully achieved an inaugural Athena SWAN Bronze award. From 2018, Caroline has been the Chair of the Central Clinical School Gender Equity, Diversity and Inclusion committee.

### Overview Research Areas and Strategic Goals

Caroline's research aims to better understand biological and environmental contributors to cognitive health and cognitive impairment across a range of disorders in psychiatry. She is particularly interested in the role of sex hormones, stress hormones and genes in cognitive functioning. Caroline combines neuropsychological assessments with eye movement research to clearly characterise cognition. She collaborates widely to enable a range of biological mechanisms to be explored – including investigation of genes and epigenetic effects; sex hormones and stress hormones. She works across a range of disorders including schizophrenia, complex trauma disorders, perimenopausal depression and Alzheimer's disease with a focus on women's mental health.

### Featured Projects

**Too stressed to think clearly? Genetics, early life trauma and the relationship between stress and cognition**

**Investigators:** Dr Caroline Gurvich (MAPrc); Dr Kiyem Bozaoglu (Murdoch Children's Research Institute, previously at Baker IDI); Prof Susan Rossell (Swinburne University); Prof Jayashri Kulkarni  
**Associate investigators:** Dr Natalie Thomas (MAPrc); Dr Elizabeth Thomas (MAPrc); Prof Marco Romano-Silva (Federal University of Minas Gerais, Brazil)

**Funding:** AMREP Collaborative Seed Grant; Platform access grant (Monash); Barbara Dicker Foundation

**Duration:** 2016–2019

**Brief description:** Early life adversity and significant or uncontrollable stress can have a significant adverse impact on higher order cognitive functions and can drive the development and exacerbation of mental illness. The overall objective of this program of studies is to better understand how early life adversity as well as different stress parameters influences mental health, emotional regulation and cognition, with a focus on memory and higher order cognitive functions. A secondary objective is to explore the biological and psychological factors that contribute to the resilience some people have when exposed to stressful or traumatic events, for example through exploration of coping strategies. The overall findings from this study will help drive larger studies in clinical populations and ultimately lead to clinical trials that can implement interventions to help reduce stress and the associated adverse effects on cognition and mental illness.

**Current status:** The first stage of this project is complete and included 61 healthy adults aged between 18 and 45 who were assessed during 2016 and 2017. Two honours students used data from this project to complete their honours theses and two manuscripts are currently under review. Findings demonstrated that self-reported stress, state anxiety and exposure to specific trauma types during childhood were differentially associated with performance on specific cognitive tasks in young adulthood.

The second part of this research program is evaluating the type and timing of early life adversity and the impact on adult cognition and emotion regulation processes. This project is ongoing and several honours students have taken part in different aspects of this project.



### Sex hormones and cognition in schizophrenia

**Investigators:** Dr Caroline Gurvich (MAPrc); Prof Jayashri Kulkarni; Dr Natalie Thomas; Ms Emmy Gavrilidis; Dr Abdul-Rahman Hudaib; Dr Roisin Worsley.

**Funding:** NHMRC Project grant (Co-CI, awarded 2011–2013), Rebecca Cooper Project grant (2019–2021)

**Duration:** 2011–2021

**Brief description:** In collaboration with Prof Kulkarni this project uses baseline data and randomised clinical trial data to understand the role of reproductive hormones (such as estrogen, progesterone, luteinising hormone) and reproductive status (such as menstrual cycle regularity vs. irregularity and menopause status) on cognitive functioning in women with schizophrenia. The project also explores the role of menopause status in the efficacy of hormone treatment on cognitive impairment in women with schizophrenia (specifically looking at whether a 'selective estrogen receptor modulator' called raloxifene can improve cognition)

**Current status:** This project is ongoing, with two publications in 2019. Our findings suggest that many women with schizophrenia have irregular menstrual cycles and this was associated with more difficulties on cognitive tasks that involve speed and memory. Our clinical trial findings suggest that a hormone treatment called raloxifene (a selective estrogen receptor modulator) can help verbal cognitive skills in some women who are going through the menopause transition or are in early post-menopausal years.

### Hormones and the Mind

**Investigators:** Dr Caroline Gurvich; Dr Natalie Thomas; Dr Elizabeth Thomas; Prof Jayashri Kulkarni; Collaborations – Dr Shalini Arunogiri.

**Brief description:** This longitudinal, observation study commenced in 2019 and tracks menstrual cycle, mood and cognition in healthy women and women with premenstrual mood disorders. The project aims to learn more about the relationship between reproductive hormones, cognition and mood. We have commenced a collaboration with Dr Shalini Arunogiri who is leading the arm of this study investigating the link between menstrual cycle and alcohol use.

**Current status:** This project is ongoing with honours students and PhD candidates involved in data collection and expanding this project further.

## Dr Caroline Thew

MBBS FRACP PhD

Deputy Head, Women's Mental Health Clinic



Dr Caroline Thew is the endocrinologist and Deputy Head of the Women's Mental Health Clinic (WMHC) at MAPrc. Dr Thew has over 20 years' experience working as a clinical endocrinologist in private practice and attached to the Royal Melbourne Hospital. Her PhD research topic was Studies of Insulin Resistance in Human Adipocytes and she maintains a particular interest in Type 1 diabetes and Polycystic Ovary Syndrome.

Dr Thew has developed a weight loss and exercise program, which is particularly helpful for patients who may have experienced weight gain as a side effect of their psychiatric medication. Furthermore, she has extensive experience in perimenopausal hormone management and this is an expanding area of clinical and research interest. She has been involved in the development of the online short course in Women's Mental Health.

## Senior Researchers (continued)

### Dr Abdul-Rahman I. Hudaib

MBBS

Research Medical Officer



Abdul-Rahman is a medical officer at Monash Alfred Psychiatry research centre (MAPRC), at Alfred health. He is a fully registered medical practitioner since 2007 and has worked with various mental health services in WA, VIC, NSW, NT and TAS. Working within the Women's Mental Health Division, he is currently directly involved in clinical trials investigating novel treatments in borderline personality disorder, and groups of depressive/psychotic disorders. Using skills in statistical modelling and clinical research as a medical officer, he aims to apply advanced mathematical models to collected data.

### Dr Pakin Kaewpijit

MD

Research Fellow, Interventional  
Psychiatry

Epworth Centre For Innovation  
in Mental Health



#### About Pakin

Dr Kaewpijit is a consultant psychiatrist with qualifications of MD (Doctor of Medicine, First-Class Honours) in his native country of Thailand. Dr Kaewpijit has been the recipient of multiple medical and mental health-related prizes, awards and vocational scholarships. He has research experience at a major tertiary university hospital in Bangkok, Thailand, and is visiting ECIMH under a 2-year scholarship from the Bangkok Hospital Headquarters, which commenced in 2019.

#### Overview of Research Areas and Strategic Goals

Dr Pakin Kaewpijit is investigating and collaborating on a research project investigating how much individualised TBS can improve depressive symptoms in depressive patients compared to standard TBS. He is also assessing and collaborating with participants in accelerated TBS trial for depressive patients. His long-term goal is to improve the effectiveness of TMS treatment in psychiatric illnesses by applying the knowledge from neuroscientific data to clinical settings.

#### Featured Project

**Individualised Theta Burst  
Transcranial Magnetic Stimulation  
for Depression**

**Investigators:** Dr Pakin Kaewpijit,  
Prof Paul Fitzgerald

**Funding:** Internal

**Duration:** 2020–2022

**Background:** Theta Burst Stimulation (TBS) is a type of Transcranial Magnetic Stimulation. There is promising evidence to suggest that individualising the stimulation frequency (the pace at which the pulses are applied within a treatment) may play a key role in improving the efficacy of TBS in MDD.

**Aims:** Our research aims to compare an individualised frequency TBS intervention to standard TBS intervention to evaluate its relative effectiveness and rapidity of antidepressant effect.

**Method/Design:** The study is a randomised controlled trial comparing 48 participants in individualised TBS group to 48 participants in the standard TBS group.

**Status:** Active; data collection is ongoing.

## Dr Manreena Kaur

BSc Hons, PhD

NHMRC Research Fellow and Head,  
Brain Stimulation and Youth Mental  
Health

Epworth Centre For Innovation  
in Mental Health



### Staff

**Ms Megan Ross** Research Assistant

### Students/Volunteers

**Ms Jessica Michael**

Doctor of Philosophy

*Investigating Brain Correlates of  
Anxiety Using Electroencephalogram  
and Transcranial Alternating Current  
Stimulation (co-supervisor)*

**Ms Sharmini Kunjan**

Bachelor of Science (Honours)

*Exploring the Relationship Between  
Heart Rate Deceleration and  
Stimulation Intensity with Neuro-  
Cardiac-guided Repetitive Transcranial  
Magnetic Stimulation (primary  
supervisor)*

### 2019 Grants & Awards

- Society for Mental Health Research Seed Grant: Kaur M, Chitty KM, Griffiths K, Chander R, Finlayson-Short L. \$5000

### Conference Presentations

- Society for Mental Health Research (SMHR) 2019 Conference, Melbourne, Australia, Oral Presentation, "Targeting the brain-heart connection to personalise and optimise rTMS treatment for depression"

### Media

- Monash University Central Clinical School News Blog, "Could magnetic pulses help beat teen depression?", 5th April 2019

### About Manreena

Dr Manreena Kaur received her PhD at the University of Sydney in 2014 and joined MAPrc in 2016. Prior to joining MAPrc, Manreena's research focused on youth mental illness, in particular, mood and psychotic disorders and utilised psychophysiology, neuropsychology and magnetic resonance imaging.

As a postdoc over the last 5 years, Manreena has extended her expertise in mental illness research by focusing on non-invasive brain stimulation treatments. Her work has been supported by the National Health and Medical Research Council Fellow (NHMRC) through the award of an Early Career Fellowship and during her PhD, a NHMRC Postgraduate Scholarship. Manreena has attracted additional funding through the prestigious NARSAD Young Investigator Award and the Society for Mental Health Research-Medibank Early Career Award (1 of only 13 in Australasia).

Manreena has played an active role in supporting research activities within MAPrc as a member of the EMCR committee and as Honours and Higher Degree Research student intake co-coordinator (2018–2019). Externally, Manreena contributes to the broader research community by serving as a Member of the Australasian Brain Stimulation Society and Society for Mental Health Research (SMHR) as well as Member of the SMHR 2019 Conference Scientific Committee. Society and Society for Mental Health Research (SMHR) as well as Member of the SMHR 2018 Conference Scientific Committee.

### Overview of Research Areas and Strategic Goals

Manreena's research focus is on investigating non-invasive brain stimulation treatments for mood and psychotic disorders, particularly as personalised approaches and early interventions. For her research, Manreena utilises psychophysiology and imaging techniques to evaluate brain stimulation treatments and to optimise individual response to these treatments. Manreena's work includes the conduct of experimental and clinical trials on repetitive transcranial magnetic stimulation (rTMS), continuous Theta Burst Stimulation (cTBS) and transcranial alternating current stimulation (tACS).



## Senior Researchers (continued)

### Featured Projects

#### Exploring the Relationship between Autonomic Arousal and Response to Magnetic Stimulation Treatments for Depression

**Investigators:** Prof Paul Fitzgerald, Dr Manreena Kaur

**Funding:** Medibio Ltd, Department of Industry, Innovation and Science

**Duration:** 2016–2019

**Background:** Depressive disorders are among the most common forms of mental illness in Australia, with a prevalence rate of approximately 6% of the population. Depression is a chronic illness and often affects individuals for a large part of their lives. The associated economic burden of illness is high and the World Health Organisation has ranked depression as the single leading cause of disability globally. First line treatment options for depression are helpful for many patients but a significant portion of patients show inadequate response and acquire treatment resistance.

Over the last two decades, clinical trials have established that repetitive transcranial magnetic stimulation (rTMS) is an efficacious for treatment resistant depression, leading to the approval of this treatment by several regulatory bodies worldwide. However, a subgroup of patients do not respond. Efforts are now focusing on elucidating features of patients that have utility in predicting response and understanding the therapeutic mechanism of rTMS in order to personalise treatment selection and reduce the burden of non-response on individuals and services. Such research have largely utilised imaging and EEG, however, measures of the autonomic nervous system (ANS) have been understudied despite being strongly linked to depression.

The current study is the first comprehensive evaluation of ANS measures in understanding rTMS treatment mechanisms and predicting response. It will investigate the effect of rTMS on ANS measures in patients with depression and, to determine the utility of these measures in distinguishing response to rTMS treatment. In this study, participants will be monitored over 24 hours at three time points around a rTMS treatment schedule (i.e. pre-treatment, mid-treatment and post-treatment, as below). Changes in ANS variables will be assessed over time and associations between the ANS and response to treatment will be evaluated.

**Status:** Sixty participants were recruited into this study. Data collection has been completed and data is currently being analysed for publication.

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#### Developing Alternative Treatments for Young People with Depression: A study of transcranial alternating current stimulation

**Investigators:** Prof Paul Fitzgerald, Dr Manreena Kaur, Dr Neil Bailey, Prof Kate Hoy

**Funding:** Perpetual Trustees Grant, Epworth Foundation

**Background:** There is a pressing need for the development of new, effective, well-tolerated and practically usable treatments for patients in the early stages of depressive disorders. Existing forms of non-invasive brain stimulation, such as magnetic brain stimulation techniques, have shown to be efficacious for treating depression but there are practical, affordability and accessibility limitations to the use of these approaches. These limitations can be overcome by non-invasive electrical brain stimulation techniques and it is likely that greater efficacy of these treatments can be achieved by tailoring treatment parameters to the individual characteristics of patients and their clinical presentation.

Therefore, we propose to conduct a parallel design, randomised sham controlled trial (with possible crossover for participants allocated to sham) to explore the efficacy of individualised theta and alpha frequency transcranial alternating current stimulation (tACS) in the treatment of young patients at early stages of depressive disorders.

One hundred and five young people (16–30 years) with depression will be recruited from mental health services. Participants will be randomised into three groups, theta, tACS, alpha tACS or sham stimulation and will receive 30 treatment sessions over four-weeks. Participants in the theta or alpha tACS arm will receive 20 minutes of treatment during each treatment session and participants allocated to the sham arm will receive 2 minutes of sham stimulation during each treatment session.

After adequate training and supervision of their initial treatment sessions, patients will be able to self-administer the treatment at home with a purpose developed device that maintains the blinding of treatment allocation. After the treatment course, participants will be assessed at three months to evaluate whether they have achieved persistent benefits of treatment. Depressive symptoms and cognition will be assessed pre-treatment, mid-treatment phase, post-treatment and at 3-month follow-up.

Participants who were allocated to sham will have the opportunity to be randomised to receive either theta tACS or alpha tACS. If through this study, we show that tACS is effective for the treatment of depression at early stages of the illness, it could be further developed as an effective, safe, cheap and accessible early intervention strategy for the treatment of depression and prevention of chronic treatment resistance in depression

**Status:** Recruitment and data collection is ongoing.

### Investigating Neuro-cardio-guided rTMS for the Treatment of Depression

**Investigators:** Dr Manreena Kaur, Prof Paul Fitzgerald, A/Prof Kate Hoy, Dr Bernadette Fitzgibbon, Ms Jessica Michael, Ms Sharmini Kunjan, Dr Melanie Emonson

**Funding:** Medibio Ltd, Department of Industry, Innovation and Science.

**Background:** One approach for optimising repetitive transcranial magnetic stimulation (rTMS) treatment protocols is individualised targeting of the brain region of interest for rTMS for depression, the dorsolateral prefrontal cortex (DLPFC). Most studies that have implemented individualised targeting have anatomical or structurally localised the DLPFC. This approach is limited as it does not consider whether the same anatomical region is the functionally optimum region for each individual.

The functional connectivity of a frontal-cingulate pathway has been recently shown to play a key role in the therapeutic mechanism of rTMS. The vagus nerve that governs heart rate connects the heart to key frontal and cingulate regions that are disrupted in depression. By using a simple measure, heart-rate, we propose that we can probe the frontal-cingulate-vagal pathway to identify an optimal treatment site for rTMS. This technique is called neuro-cardiac guided rTMS.

A pilot study showed that the frontal site of heart rate change with high-frequency rTMS varies across individuals. This site is postulated to be the most functionally connected to the frontal-cingulate-vagal pathway. Our study (published) provided further evidence of individual variability in the frontal site of greatest heart rate change suggesting neuro-cardiac-guided TMS may be used to identify a individualised, functionally relevant site for rTMS treatment of depression.

**Status:** Data collection completed and one paper published.

### Associate Professor Jerome Maller

BSc, GradDipPsych, MSc, PhD  
Neuroscientist  
Therapeutic Brain Stimulation



### About Jerome

I am a neuroscientist and Adjunct Associate Professor at MAPrc. I am also an MRI Clinical Science Specialist at General Electric Healthcare. I focus on multimodal integration of brain measurement and stimulation technologies.

I have been in the field of neuroscience for nearly 20 years and as such I have been involved in the rapid advancement of many of these technologies, such as magnetic resonance imaging, transcranial magnetic stimulation, electroencephalography and electrovestibulography. Equipped with this experience and specialized skill set, I aim to apply my niche abilities to develop new diagnostic tools and treatment strategies for psychiatric disorders and traumatic brain injury.

I have been awarded various degrees which were completed at a variety of renowned universities, supervised 24 students, published more than 100 articles in peer-reviewed journals with over 5000 citations, I am a reviewer for 45 international journals and have been an invited speaker at a number of conferences and symposia.

I completed a Victorian Neurotrauma Early Career Fellowship (2008–2011) and in 2011 was awarded an NHMRC Industry Career Development Award (2011–2015). I was also awarded the Centre for Excellence in Traumatic Brain Injury Research (CETBIR) Acute Care Fellowship in 2014. I have many affiliations with national and international universities and hospitals. I have also been involved in attracting more than AUD\$4 million of funding and over AUD\$5 million as part of industry collaborations.

## Senior Researchers (continued)

My Web Of Science H-index is 34 with 3334 citations (<https://publons.com/researcher/2515569/jerome-j-maller/> ; <http://www.researcherid.com/rid/H-4963-2014> ; <http://orcid.org/0000-0003-4685-1508> ) and an average of 29.5 citations per article. My ResearchGate H-index is 36 with a score (62.6) that is higher than 97.5% of ResearchGate members' ([https://www.researchgate.net/profile/Jerome\\_Maller/scores](https://www.researchgate.net/profile/Jerome_Maller/scores) ) and is the 4th highest score under the category of Diffusion MRI. I have over 16,000 views on Loop and more publications than 98% of all Loop authors (<https://loop.frontiersin.org/people/23830/impact>).

### Featured Projects

**“The Aftershock” – Understanding the impact of traumatic brain injury on depression and emotional regulation**

**Investigators:** Grieve SM, Maller JJ, Rosenfeld JV, Gruen R, Dinh M

**Funding:** NHMRC

**Duration:** 2016–2019

**MRI of ligaments and tendons using diffusion tensor imaging**

**Investigators:** Smith PM, Phal P, Maller JJ, Botterill E, Kokkinos C

**Funding:** Epworth Research Institute

**Duration:** 2018–2019

## Dr Steven Miller

MBBS, PhD, Mast Occ Env Health

Adjunct Senior Research Fellow

Head, Perceptual and Clinical Neuroscience Laboratory

Monash Biomedicine Discovery Institute



### 2019 Staff

**Dr Phillip Law**

Post-Doctoral Researcher

### 2017/2018 Grants & Awards

- Collaborative clinical, technical and user-interface research to accelerate translation of an online visual test to diagnose bipolar disorder. Dr Steven Miller, Dr Phillip Law, Dr Kirsten Ellis (key collaborator Prof. Nicholas Martin). Victorian Government Department of Health and Human Services Medical Research Acceleration Fund Tier 1 – \$100,000, Duration: Initial development 2017, grant funding commences Apr. 2018, completion Dec. 2019
- Title: Non-invasive neuromodulation of psychiatric and neurological disorders using caloric vestibular stimulation. Dr Steven Miller, Prof Daphne Flynn, Dr Andrew Nunn (key collaborators Dr Phillip Law, Prof Paul Fitzgerald) Monash Institute of Medical Engineering – \$100,000, Duration: Commenced Jul. 2017, completion Dec. 2019

### About Steven

Steven is a clinician in occupational and pain medicine, and a researcher in clinical neuroscience, visual neuroscience and consciousness science. His lab is based at Monash Biomedicine Discovery Institute but he retains an Honorary Researcher position at MAPrc. The lab is engaged in basic science and clinical research and has also recently entered the virtual research environment, with wide national and international collaboration for its new Binocular Rivalry Online (BRO) project. The lab has a strong clinical translation focus for both its visual neuroscience and brain stimulation themes. In clinical work Steven provides medical advice on the Victorian Government's WorkSafe and Transport Accident Commission's clinical panels.



## Overview Research Areas and Strategic Goals

Steven co-discovered that the rate of binocular rivalry – a perceptual switching phenomenon – is slow in bipolar disorder, and that an individual's binocular rivalry rate is under substantial genetic control. Following on from these discoveries, Steven is developing an online binocular rivalry test for convenient and low-resource testing of large-scale clinical and control samples (thousands to tens of thousands of subjects), aiming to (i) improve genome-wide association studies of psychiatric disorders, (ii) examine psychiatric disorder diagnostic discrimination, and (iii) facilitate standardisation of behavioural protocols for binocular rivalry testing. Steven is also driving research on neuromodulation with caloric vestibular stimulation — a simple, safe, affordable and non-invasive brain stimulation technique — to treat various clinical conditions. His current focus for this work is on persistent pain conditions. Steven also engages in theoretical analytical work and has performed detailed analyses on the empirical and conceptual foundations of consciousness science.

## Featured Projects

### Collaborative clinical, technical and user-interface research to accelerate translation of an online visual test to diagnose bipolar disorder

**Investigators:** Dr Steven Miller, Dr Phillip Law, Dr Kirsten Ellis (key collaborator Prof. Nicholas Martin)

**Funding:** Victorian Government Department of Health and Human Services Medical Research Acceleration Fund Tier 1 – \$100,000

**Duration:** Initial development 2017, grant funding commences Apr. 2018, completion Dec. 2019

**Brief Description:** This project is developing an online visual test to diagnose bipolar disorder (BD). BD, schizophrenia (SCZ) and major depressive disorder (MDD) are commonly misdiagnosed with enormous personal, social and economic costs. Principal investigator, Miller, has shown that a visual test, binocular rivalry (BR), could reduce such misdiagnosis, identify at-risk individuals, and help find genes for BD. To fully examine the BR test requires very large sample sizes (1000s to 10000s), so an online test platform is required.

An online BR test prototype has been developed via successful health and research (Monash Alfred Psychiatry Research Centre; MAPrc) and Monash Faculty of Information Technology (FIT) partnership, with seed funding from Monash Institute of Medical Engineering (MIME) and Defence Health Foundation (DHF). This project is accelerating test (i) front- and backend development, (ii) user-interface testing, and (iii) roll out in 5000 healthy subjects (Australia) and 5000 BD subjects (UK).

The project will quality assure the online test and provide rollout data for analysis and publication. 'Binocular Rivalry Online' will be based in Victoria, yielding ongoing collaborations between Victoria and international psychiatric research consortia and advancing a variety of engagement and innovation opportunities.

### Non-invasive neuromodulation of psychiatric and neurological disorders using caloric vestibular stimulation

**Investigators:** Dr Steven Miller, Prof Daphne Flynn, Dr Andrew Nunn (key collaborators Dr Phillip Law, Prof Paul Fitzgerald)

**Funding:** Monash Institute of Medical Engineering – \$100,000

**Duration:** Commenced Jul. 2017, completion Dec. 2019

**Brief Description:** This project is examining a new, inexpensive brain stimulation technique to treat persistent (chronic) pain (PP). PP is an increasingly problematic area of health care, costing billions of dollars annually. In addition to poor efficacy, available PP treatments are often expensive and invasive. Caloric vestibular stimulation (CVS) is a non-invasive, safe, inexpensive means of activating brain regions involved in PP, thereby reducing PP. Principal investigator, Miller, has completed a study of 34 PP subjects finding promising CVS therapeutic effects. He is continuing to investigate potential therapeutic effects of CVS in PP and to widen examination of the technique's potential efficacy in a range of psychiatric and neurological conditions.

## Senior Researchers (continued)

### Dr Gemma Sharp

BSc (Mol Biol) (Hons), Dip Lang,  
MSc, Grad Dip Psyc Sci, BBSc  
(Hons), PhD (Clin Psyc)

NHMRC Early Career Research  
Fellow

Clinical Psychologist

Head, Body Image Research Group



### 2019 Staff/Volunteers

**Dr Francesca Beilharz**  
Post-Doctoral Researcher

**Dr Elizabeth Thomas** Post-Doctoral  
Researcher, Women's Mental Health

**Pascale Maynard**  
Volunteer research assistant

### 2019 Students

**Tanya Gilmartin** PhD  
*The relationship between dimensional  
models of personality pathology and  
disordered eating behaviour*

**Sarah Rotstein** PhD  
*Medical students' stigma against  
psychiatry*

**Ellie Aniulis** PhD  
*Slim Picking: Attentional bias toward  
thin bodies*

**Bradley Stolz-Grobusch** PhD  
*Depression and anxiety in relation to  
trauma within borderline personality  
disorder: Piloting a clinical trial of  
cognitive bias modification*

**Nileshni Fernando** BBioMedSc (Hons)  
*Genital self-image and labiaplasty in  
adolescents*

**Marisha Shetty** BMedSc(Hons)  
*Gender and perceptions of stress*

### 2019 Grants

- Psychoeducational program to address women's genital appearance concerns (\$193,771 AUD) Sharp, G. National Health & Medical Research Council (NHMRC) Early Career Fellowship 1/01/2018 – 31/12/2021
- Development of a Genital Surgery Patient-Reported Outcome Measure (\$11,910 AUD) Sharp, G., Kulkarni, J., Sarwer, D., Hamori, C., Oates, J. The Aesthetic Surgery Education and Research Foundation 1/01/2019 – 31/12/2020
- Body Image Social Media Intervention (\$42,000 AUD), Sharp, G, AMP Foundation, 28/11/2019-31/12/2021

- Interventions to Promote Positive Body Image (\$5,000 AUD) Sharp, G. BUPA Health Foundation 27/08/2019 – 31/12/2020
- Snapchat Dysmorphia: The role of social media in young people's body image concerns and online interventions (\$21,291 AUD) Sharp, G., Robards, B., Kulkarni, J., Petersen, A. Monash University – Internal Faculty Contribution 1/01/2019 – 30/11/2019
- Psychoeducational Mobile App Addressing Women's Genital Concerns (\$5,120 AUD) Sharp, G. Cottons Pty Ltd 4/05/2018 – 2/07/2019
- Central Clinical School Travel Grant (\$3,750 AUD) Sharp, G. Monash University 2019

### 2019 Awards

- AMP Tomorrow Maker Award National Winner
- Editor's Choice Article Award for November 2019 issue of Aesthetic Surgery Journal
- Editor's Choice Award for March 2019 issue of Aesthetic Surgery Journal
- National Finalist, Bupa Health Foundation Emerging Health Researcher

### 2019 Conference Presentations

#### Invited Speaker

- Sharp, G. (2019, December). Snapchat dysmorphia. Body Image and Related Disorders Conference 2019, Melbourne, Australia.
- Sharp, G. (2019, November). Gathering of kindness: Kindness in health care, KMPG Gathering of Kindness Event, Melbourne, Australia.
- Sharp, G. (2019, September). The growing trend of cosmetic genital procedures: Motivations and outcomes. Sex, Death and Change RANZCP Faculty of Consultation-Liaison Psychiatry, Hobart, Australia.

- Sharp, G. (2019, September). Disorders of body image. In *Her Shoes: A Conference on Women's Mental Health for Medical Practitioners*, Melbourne, Australia.
- Sharp, G., Hudaib, A.R., & Kulkarni, J. (2019, August). The influence of sociocultural and psychological factors on consideration of labiaplasty in adolescent girls, Australian Society for Psychosocial Obstetrics & Gynaecology Conference, Melbourne, Australia.
- Sharp, G. (2019, June). Psychology & aesthetic surgery – New ways of working? An Australian perspective. Australasian Foundation for Plastic Surgery Workshop, Melbourne, Australia.
- Sharp, G. (2019, April). The psychology of cosmetic surgery. Australian Psychological Society Science Meets Practice Webinar Series, Melbourne, Australia.
- Sharp, G., Robards, B., Kulkarni, J., & Petersen, A. (2019, June). "Snapchat Dysmorphia": Changing the chatter around the pursuit of the "perfect" selfie. DigiCog 2019 Conference. Sernhac, France.
- Sharp, G., Kulkarni, J., & Gurvich, C. (2019, May). Walking in her shoes: Innovative strategies for working with Borderline Personality Disorder clients. Australian Psychological Society College of Clinical Psychologists Conference. Melbourne, Australia.

## 2019 Media

### Online Print

- Herald Sun: "Selfie surgery alarm: Social media dysmorphia strikes teens" Dec 2019 [https://www.heraldsun.com.au/subscribe/news/1/?sourceCode=HSWEB\\_WRE170\\_a\\_GGL&dest=https%3A%2F%2Fwww.heraldsun.com.au%2Fnews%2Fvictoria%2Fsocial-media-filters-prompting-teens-to-turn-to-plastic-surgery%2Fnews-story%2Fefc9b1a309a5ae882c3460e9f30902d6&memtype=anonymous&mode=premium](https://www.heraldsun.com.au/subscribe/news/1/?sourceCode=HSWEB_WRE170_a_GGL&dest=https%3A%2F%2Fwww.heraldsun.com.au%2Fnews%2Fvictoria%2Fsocial-media-filters-prompting-teens-to-turn-to-plastic-surgery%2Fnews-story%2Fefc9b1a309a5ae882c3460e9f30902d6&memtype=anonymous&mode=premium)
- ABC Life: "The health consequences of body shaming women" Nov 2019 <https://www.abc.net.au/life/the-health-consequences-of-body-shaming-women/11473660>
- ABC Life: "Strategies for feeling better about the body you're in" Jun 2019 <https://www.abc.net.au/life/tips-for-overcoming-bad-body-image-unrealistic-ideals/11177218>
- Medical Republic: "How to spot rubbish qualitative research" Mar 2019 <http://medicalrepublic.com.au/spot-rubbish-qualitative-research/19999>
- Cosmos Magazine: "Race influences our response to cosmetic surgery" Jan 2019 <https://cosmosmagazine.com/society/race-influences-our-response-to-cosmetic-surgery>

## Oral presentations

- Sharp, G., Robards, B., & Moran, C. (2019, November). "Tell us about your selfie": A qualitative study of social media, selfies and body image in teenagers. Society for Mental Health Research Conference. Melbourne, Australia.
- Sharp, G., Hudaib, A.R., & Kulkarni, J. (2019, August). The influence of sociocultural and psychological factors in genital body image in adolescent girls. Australia and New Zealand Academy for Eating Disorders 2019 Conference. Adelaide, Australia.
- Gilmartin, T., Gurvich, C., & Sharp, G. (2019, August). Personality disorders and eating disorders. Australia and New Zealand Academy for Eating Disorders 2019 Conference. Adelaide, Australia.

## TV interviews

- WIN TV "Selfie surgery alarm: Social media dysmorphia strikes teens" No weblink available Dec 2019
- ABC Catalyst "Investigating Body Dysmorphia" <https://www.abc.net.au/catalyst/s20-e10-investigating-body-dysmorphia/11564912> Oct 2019
- ABC News Tonight "Reality TV and suicide" [https://abcportal-my.sharepoint.com/:v:/g/personal/wijers\\_meike\\_abc\\_net\\_au/ERx\\_MDzU4\\_VBsOFYHIS1w\\_BoBrbDN9rAsR\\_QF6FU7cVUgkaA?e=hwABaq](https://abcportal-my.sharepoint.com/:v:/g/personal/wijers_meike_abc_net_au/ERx_MDzU4_VBsOFYHIS1w_BoBrbDN9rAsR_QF6FU7cVUgkaA?e=hwABaq) May 2019

## Radio Interviews

- 3AW "Breakfast" Dec 2019 No weblink available
- ABC Melbourne "Evenings with David Astle" Nov 2019 <https://www.abc.net.au/radio/melbourne/programs/evenings/evenings/11648214>
- ABC "Ladies We Need To Talk" Jun 2019 <https://www.abc.net.au/radio/programs/ladies-we-need-to-talk/body-image-why-do-we-hate-our-bodies/11172664>
- "The Up Beet Podcast" (Independent program) Feb 2019 <https://theupbeetpodcast.com/episodes-1-10/> (Episode 1)
- Triple R "Radiotherapy" – ongoing hosting role 2019 Various episodes: <https://www.rrr.org.au/explore/programs/radiotherapy>

## Online Videos

- AMP Tomorrow Maker Award Nov 2019 <https://www.youtube.com/watch?v=5PHxFGeHd0c>
- Editor's Choice for November 2019 Issue of Aesthetic Surgery Journal Nov 2019 <https://www.youtube.com/watch?v=ADKHmZNMzP0>
- Australian Academy of Science Aug 2019 <https://www.youtube.com/embed/E3hYv89KTDM?rel=0>



## Senior Researchers (continued)

- Bupa Health Foundation Emerging Health Researcher Award Aug 2019 <https://www.youtube.com/watch?v=35eiGzgXUVQ&feature=youtu.be>
- Australian Psychological Society Institute Webinar Apr 2019 <https://www.psychology.org.au/Event/20469?view=true>

### About Gemma

Dr Gemma Sharp started her career as a biomedical scientist and obtained a Master's degree from the University of Cambridge (2010). She started to become more interested in looking at whole people rather than their cells under a microscope and transitioned to the study of clinical psychology, obtaining her PhD from Flinders University (2017). Her career in biomedical science and clinical psychology has seen her study and work in Australia, the UK and Japan.

Dr Sharp began researching in the field of body image and body modification in 2012. She noted that the fastest growing trend in cosmetic surgery in women was genital surgery. She wondered why women wanted to undergo surgery on a part of their body that was rarely seen by others and this was the focus of her PhD research. She subsequently enhanced this research to include male genital procedures. She is considered to be a world expert in the field of genital body image.

Dr Sharp has most recently extended her research to the development of novel body image focused interventions using digital technology. She has formed key partnerships with the Butterfly Foundation, social media platforms and tech companies in order to generate these innovative tools. She aims to similarly become a world leader in the development of mental health focused digital technologies.

### Overview Research Areas and Strategic Goals

More than 43% of Australians of all genders, ages and backgrounds struggle with their body image. Negative body image is a major risk factor for the development of eating disorders and body dysmorphic disorder, as well as a range of other mental health conditions including depression, anxiety and substance abuse. There is a misconception that body image concerns are due to "vanity" and that "disliking" your body is "normal". These could not be further from the truth and these concerns can and do lead to deadly mental health conditions. Research in this area is so important as it helps to raise awareness of the seriousness of these issues as well as developing novel treatments to assist the large number of people impacted by body image concerns.

### Featured Projects

#### Developing an Artificial Intelligence Positive Body Image Chatbot

**Investigators:** Sharp, G. Kulkarni, J., Sukunesan, S., Louise, S., Rossell, S.

**Funding:** AMP Foundation, Bupa Health Foundation

**Brief description:** This project will develop a world-first body image chatbot in collaboration with the Butterfly Foundation, Instagram (owned by Facebook) and Proxima (chatbot company).

**Current status:** commenced in late 2019

#### Developing a patient-reported outcome measure for women undergoing cosmetic genital procedures

**Investigators:** Sharp, G., Kulkarni, J., Sarwer, D., Hamori, C., Oates, J.

**Funding:** Aesthetic Surgery Education and Research Foundation

**Brief description:** This project will develop a world-first patient-reported outcome measure which will assist with the evidence-based screening and evaluation of highly popular cosmetic genital procedures.

**Current status:** commenced in early 2019

# POST-DOCTORAL RESEARCHERS

## Dr Robin Cash

PhD

Research Fellow – Interventional Psychiatry

Epworth Centre for Innovation in Mental Health



### 2019 Students

**Robert Cooper** PhD Candidate

*Effect of tACS frequency, amplitude and synchronisation on working memory*

**Xianwei Che** PhD Candidate

*Examining the Role and Neurophysiological Mechanisms of Social Support in Pain Experience*

### About Robin

Dr Robin Cash is a neuroscientist who uses brain stimulation and neuroimaging techniques to enhance our understanding of brain function & advance therapeutic brain stimulation approaches. Dr Cash worked with several other leading international research groups in Frankfurt, New York and Toronto before joining the team in 2016. One of his main foci is on neuroplasticity (i.e. the malleability of the brain) and our capacity to harness this fundamental and fascinating property to modulate and potentially normalise brain function in mental illness.

He is also interested in the factors underpinning inter-individual variability in response to brain stimulation treatments and the development of personalised treatment approaches that ensure more consistent treatment benefits.

### Overview Research Areas and Strategic Goals

Dr Cash's research is helping to unravel the neural basis of clinical response to brain stimulation therapy in depression. In particular, his research is helping to define the relationships between neuroplasticity, brain network connectivity and treatment outcomes. This body of research provides the framework for predicting, enhancing and ensuring positive clinical outcomes.

### Featured Projects

**Brain plasticity and inhibition as mechanisms in depression and predictors of treatment outcome**

**Investigators:** Dr Robin Cash, Prof Paul Fitzgerald, Ms Susan McQueen, Mr David Elliot, Ms Lenore Wambeck

**Funding:** N/A

**Duration:** 2016–2019

**Background:** There are no reliable predictors of clinical response to repetitive transcranial magnetic stimulation therapy in depression. This treatment can be time consuming and costly. This study examines whether brain plasticity (i.e. the neurophysiological capacity for the brain to change) predicts longer-term clinical response to a course of repetitive transcranial magnetic stimulation (rTMS) in depression. The study is also designed to investigate inhibitory properties of brain function. This study employs transcranial magnetic stimulation and electroencephalography (TMS-EEG).

**Aims:** To establish whether brain plasticity predicts longer-term antidepressant response to rTMS.

**Method/Design:** Volunteers with treatment resistant depression participated in a TMS-EEG session prior to completing 4–6 weeks of rTMS treatment. TMS-EEG provided the means to assess neuroplasticity.

**Status:** Results being analysed.

### Relationship between rTMS treatment site and antidepressant outcome

**Investigators:** Dr Robin Cash, Prof Paul Fitzgerald, Andrew Zalesky, Richard Thomson, Jerome Maller, David Elliot, Melanie Emonson, Caley Sullivan, Rodney Anderson, Kate Hoy, Susan McQueen, Bernadette Fitzgibbon, Luca Cocchi, Ye Tian

**Funding:** N/A

**Duration:** 2017–2019

**Background:** The optimal stimulation site for rTMS treatment within the relatively large expanse of the prefrontal cortex has remained a matter of longstanding interest. In this context, 'optimal' refers to the site that yields maximal clinical treatment response. Recent work suggests that the optimal site may be dictated by underlying aspects of brain connectivity.

**Aims:** To identify the optimal treatment site within the DLPFC and its relationship to brain connectivity.

**Method/Design:** Volunteers with treatment resistant depression received a magnetic resonance imaging brain scan prior to completing 5–8 weeks of rTMS treatment. Results were retrospectively analysed to ascertain the relationship between brain connectivity at the stimulation site and treatment response.

**Status:** This study provides some of the strongest evidence to date for the relationship between brain connectivity at the precise stimulation site and treatment response. These results add to a growing body of work and future studies may aim to prospectively personalise treatment site based on brain connectivity. Publication: Cash et al., 2019, Biological Psychiatry (in press).

## Post-Doctoral Researchers (continued)

### Aberrant brain network dynamics in depression and a prediction of treatment outcome

**Investigators:** Dr Robin Cash, Prof Paul Fitzgerald, Andrew Zalesky, Richard Thomson, Jerome Maller, David Elliot, Melanie Emonson, Caley Sullivan, Rodney Anderson, Kate Hoy, Susan McQueen, Bernadette Fitzgibbon, Luca Cocchi

**Funding:** N/A

**Duration:** 2017–2019

**Background:** Neuroimaging (i.e. magnetic resonance imaging) can be used to characterise brain activity and networks. Recent work suggests that neuroimaging-based predictors of treatment response may be more accurate than clinical or demographic variables. Nonetheless, no accurate established neuroimaging biomarkers of treatment response exist to date.

**Aims:** (i) To characterise brain network abnormalities in depression. (ii) To integrate multiple biomarkers of treatment response using machine learning to more accurately predict clinical outcome to rTMS.

**Method/Design:** Volunteers with treatment resistant depression received a magnetic resonance imaging brain scan prior to completing 5–8 weeks of rTMS treatment. Based on the brain scans, various illness and treatment outcome relevant biomarkers were assessed and integrated using machine learning to develop a novel multivariate predictor of treatment response.

**Status:** The results suggest that using a small number of disease and treatment relevant neurobiological features, treatment responders and non-responders could be classified with 85–95% accuracy. Various stringent tests were performed to ensure the accuracy and transparency of this method. Nonetheless, this method will need to be tested in a separate cohort to ensure generalisability. Paper submitted and under review.

### Dr Natalia Contreras

PhD

Clinical Research Fellow

Research Coordinator –  
Interventional Psychiatry

Epworth Centre for Innovation  
in Mental Health



As a Senior Study Coordinator and qualified clinical and psychometric rater in commercially sponsored trials and investigator-initiated trials, she has developed strong skills in advancing, implementing and monitoring research consistent with national and international regulatory ICH-GCP guidelines. Natalia is currently coordinating several commercially sponsored trials under the supervision of PI Prof Paul Fitzgerald. Natalia also contributes to centre-wide systems and provides training, mentorship and support to research assistants/officers.

### Overview of Research Area

Natalia is passionate in pursuing her career in research environments that are dedicated to developing innovative mental health treatments, and provide high quality, translational clinical research. She is particularly interested in investigating and understanding the personal experience of individuals undertaking clinical and psychosocial interventions.

### Featured Projects

#### Investigating the patient experience of a novel brain stimulation for Alzheimer's disease

**Investigators:** PI Prof Kate Hoy, Prof Paul Fitzgerald, Sally Herring

**Funding Source:** Epworth Foundation, Epworth Research Institute Translational Grant

#### Brief Description/Overview:

Alzheimer's disease is characterised by progressive decline in cognitive functioning with limited treatment options. We have recently developed a novel form of brain stimulation that is able to restore abnormal firing patterns and will evaluate this in an initial proof of concept randomised clinical trial. Given the scarce evidence on the personal experience of individuals undertaking such interventions, we will also conduct a patient experience investigation as part of the randomised clinical trial, with both participants and their carers.

**Current Status:** 15 participants screened

### 2019 Grants

- 2018–2019, Epworth Medical Foundation, Epworth Research Institute Translational Grant – \$50k

### About Natalia

Natalia Contreras is a Clinical Research Fellow and Research Coordinator for commercially sponsored trials in the Interventional Neuropsychiatry group. Natalia completed her PhD in Psychology at Monash University. Possessing a clinical background in psychological interventions spanning 10 years, Natalia has wide-ranging and diverse experience in mental health research trials. For the last 3 years she has been coordinating commercially sponsored clinical trials at Epworth HealthCare. She has extensive experience working with various populations such as those with a diagnosis of depression, schizophrenia, bipolar disorder and Alzheimer's disease.



## Dr Melanie Emonson

BBNSc (Hons), Doctor of Psychology (Clinical Neuropsychology)

Clinical Research Fellow/Research Coordinator, Interventional Neuropsychology

Epworth Centre for Innovation in Mental Health



### 2019 Students

**Ms Georgia Koutsaplis** Honours

*Investigate whether the effects of tDCS on cognition are driven by generalised improvements in information processing.*

### About Melanie

Melanie is a Clinical Research Fellow and Research Coordinator in the Interventional Neuropsychology Research Group. In this role she co-ordinates a randomised clinical trial investigating theta burst stimulation for the treatment of mild-to-moderate Alzheimer's disease, and projects investigating the use of noninvasive brain stimulation techniques to improve cognitive functioning in mild cognitive impairment and mild Alzheimer's disease.

Melanie has presented at over six national and international conferences, has expertise in neuropsychological assessment and diagnosis, and over nine years' experience in non-invasive brain stimulation techniques and TMS-EEG. Melanie has delivered presentations to school students, community groups and medical doctors about her work and the use of TMS. She has appeared on ABC News Live to provide her expert opinion on non-invasive brain stimulation techniques.

Melanie completed her Doctor of Psychology (Clinical Neuropsychology) at Monash University in 2018 under the supervision of A/Prof Kate Hoy, Prof Paul Fitzgerald and Dr Nigel Rogasch. Her thesis investigated the neurobiological and cognitive effects of transcranial direct current stimulation in healthy aging and mild cognitive impairment. Melanie is currently completing her Clinical Neuropsychology registrar program

### Overview of Research Area

Research interests include investigating the therapeutic benefit of non-invasive brain stimulation treatments to assist cognitive functioning in healthy aging, Alzheimer's disease and mild cognitive impairment. Melanie has a strong interest in consumer engagement and investigating evidence-based interventions for carers of individuals with Alzheimer's disease. Melanie is also passionate about the development of neuropsychological interventions to improve daily functioning and quality of life for individuals with cognitive dysfunction, and the importance of early intervention in supporting and empowering carers of people with Alzheimer's disease

### Featured Project

**ECLIPSE: An early intervention to empower and support carers of individuals with Alzheimer's disease**

**Investigators:** Dr Melanie Emonson (PI), A/Prof Kate Hoy, Prof Fitzgerald, Dr Caroline Gurvich.

**Funding Source:** Epworth HealthCare, Epworth Research Capacity Building Grant

**Brief Description/Overview:** The carer of a person with Alzheimer's disease can be as much a "client" of a health service as a patient. They are heavily involved in facilitating the treatment and engagement of a patient, and thus need to be supported in this role that may have been unexpectedly thrust upon them. Carer burnout has been identified as one of the main reasons individuals with dementia enter long-term care, therefore early intervention to support and empower carers is critical. Interventions for carers of individuals with a chronic illness have been shown to improve the psychological wellbeing of carers.

ECLIPSE – a newly designed, fortnightly, small-group-based intervention – will be provided over an eight-week period to carers of individuals recently diagnosed with Alzheimer's disease. This project aims to implement and evaluate the effectiveness of ECLIPSE to improve psychological wellbeing, and to empower and support carers.

**Current Status:** Ethics obtained

## Post-Doctoral Researchers (continued)

### Dr Aron Hill

BA/BSc (Hons), PhD

Post-Doctoral Research Fellow,  
Interventional Psychiatry

Epworth Centre for Innovation in  
Mental Health



#### 2019 Students

**Marie-Claire Davis** PhD

*Therapeutic Transcranial Brain  
Stimulation in Progressive Neurological  
Disease*

#### 2019 Grants

- Whole Time Medical Specialists Travelling Scholarship (Alfred Hospital) (\$6,635). Awarded to attend the 3rd International Brain Stimulation Conference, Vancouver, Canada

#### 2019 Conference Presentation

- “Impact of Concurrent task Performance on Transcranial Direct Current Stimulation (tDCS)-Induced Changes in Cortical Physiology and Working Memory” 3rd International Brain Stimulation Conference, Vancouver, Canada (March, 2019). Poster Presentation.

#### 2019 Media

- Research featured on Parkinson's News Today (<https://parkinsonsnewstoday.com/2019/10/24/brain-stimulation-method-cognitive-function-parkinsons-study/>), October 24, 2019.

#### About Aron

Dr Aron Hill is a Post-Doctoral Research Fellow in the fields of Brain Stimulation and Psychiatry. He received a PhD in neuroscience from Monash University in 2018 and has since undertaken post-doctoral training at the Monash Alfred Psychiatry Research Centre in Melbourne, and the Centre for Addiction and Mental Health, University of Toronto, Canada. Aron's research aims to explore the neurobiology of complex psychiatric disorders, with particular emphasis on understanding neural circuits linked to cognitive dysfunction and aberrant neural plasticity. To achieve this aim, Aron's work combines physiological measures of brain activity (e.g., electroencephalography [EEG]) with non-invasive brain stimulation technologies (e.g., transcranial magnetic stimulation [TMS] and transcranial electrical stimulation [tES]). Through these multi-modal approaches, Aron aims to uncover important brain-behaviour relationships leading to novel diagnostic markers, as well as potential treatment targets for therapeutic interventions.

#### Overview Research Areas and Strategic Goals

Aron's research aims to use non-invasive brain stimulation technologies to understand, and ultimately treat, cognitive dysfunction associated with neuropsychiatric disorders such as autism spectrum disorder, major depressive disorder, and schizophrenia. These disorders all display abnormalities in neural plasticity – the brain's ability to adapt and respond to the environment, which is crucial for learning and memory. Emerging brain stimulation technologies such as transcranial magnetic stimulation (TMS) combined with physiological neuroimaging techniques (e.g., electroencephalography [EEG]) are enabling researchers to uncover a more detailed and nuanced picture of alterations in neural plasticity in many psychiatric disorders. Further, brain stimulation techniques such as TMS can also be used to induce transient changes in plasticity in parts of the brain vital for cognitive function (thinking abilities). This is beginning to open the door to exciting new treatment opportunities aimed at improving cognition in individuals suffering from a wide variety of brain-based disorders.

#### Featured Project

##### BrainAmp Project

**Investigators:** Paul Fitzgerald, Kate Hoy, Aron Hill, Caley Sullivan, Richard Thompson, Karyn Richardson, Sungwook Chung.

**Funding Source:** Internal

**Brief Description/Overview:** This project aims to develop a closed-loop transcranial alternating current (tACS) device for modulating brain activity.

**Current Status:** Ongoing

## Dr Phillip Law

PhD

Perceptual and Clinical  
Neuroscience Laboratory



### About Phillip

Phillip is a post-doctoral researcher in visual neuroscience and clinical neuroscience. He is engaged in basic science with a strong clinical translation focus — examining mechanisms and clinical applications of a perceptual switching phenomenon called binocular rivalry — and is currently involved in wide national and international collaboration with the Binocular Rivalry Online (BRO) project.

### Overview Research Areas and Strategic Goals

Phillip has shown that slow binocular rivalry rate in bipolar disorder is a perceptual trait that cannot be explained by eye movement abnormalities. He has also shown the optimal stimulus characteristics for online binocular rivalry rate testing, and stemming from this important contribution to the BRO project, Phillip is co-developing and validating the BRO platform for low-cost testing of existing large-scale clinical and control cohorts (thousands to tens of thousands of subjects). This work aims to (i) improve diagnostic discrimination of psychiatric disorders, (ii) enhance power in psychiatric genome-wide association studies, and (iii) standardise binocular rivalry testing for meaningful comparison of data collected from different research centres.

### Featured Projects

See Dr Steve Miller Featured projects

## Dr Oscar Murphy

BSc, BA (Hons), Doctor of  
Clinical Psychology (Clinical  
Neuropsychology)

Post-Doctoral Research Fellow/  
Research Psychologist

Research Coordinator,  
Interventional Psychiatry Group



### About Oscar

Oscar is a Post-Doctoral Clinical Research Fellow and Research Coordinator in the Interventional Psychiatry Group. He is a registered psychologist with expertise in neuropsychological assessment and diagnoses within various neurological and psychiatric populations. Oscar has more than five years of experience using a range of non-invasive brain stimulation techniques, including transcranial direct current stimulation (tDCS), transcranial random noise stimulation (trNS), and transcranial magnetic stimulation (TMS).

Oscar completed his Bachelor of Arts and Science at Monash University, majoring in Psychology and Marine Biology, followed by an Honours Degree in Psychology.

## Post-Doctoral Researchers (continued)

He subsequently completed his Doctor of Psychology (Clinical Neuropsychology) at Monash University in 2019 under the supervision of Professor Kate Hoy, Dr Rebecca Segrave, and Dr Dana Wong. His doctoral thesis investigated the cognitive and electrophysiological effects of tDCS and tRNS in healthy individuals and those suffering from depression. His thesis also examined the neurobiological changes which underlie altered working memory processing in depression. Oscar has presented this research at domestic and international conferences.

### Overview Research Areas and Strategic Goals

Oscar's research interests include investigation of the pathophysiology of psychiatric illness, as well as the development and innovation of innovative brain stimulation techniques. Non-invasive brain stimulation techniques can be utilised as investigative tools to explore the neurophysiological activity underlying psychiatric and neurological illness, as well as therapeutic tools to potential correct the altered neurophysiological activity associated with the pathophysiology of these conditions. By combining non-invasive brain stimulation techniques with neuroscientific measurement tools, such as electroencephalogram (EEG) and Magnetic Resonance Imaging (MRI), it is hoped that this area of research will lead to greater understanding of the mechanisms underlying psychiatric and neurological illness, as well as the development of innovative treatments.

Oscar currently coordinates a randomised-controlled trial investigating theta-burst stimulation for the treatment of Obsessive-Compulsive Disorder (OCD), as well as projects investigating the application of non-invasive brain stimulation techniques to treat various neuropsychiatric conditions. The overarching goal of this research is to reduce symptom severity and improve quality of life for individuals suffering from psychiatric and neurological illness.

### Featured Projects

**Optimized brain stimulation for treatment of Obsessive-Compulsive Disorder**

**Investigators:** Professor Paul Fitzgerald, Dr Luca Cocchi, Associate Professor Andrew Zalesky, Dr Chris Steward, Dr Oscar Murphy, Dr Sally Herring

**Funding Source:** National Health and Medical Research Council (NHMRC)

**Brief Description/Overview:** Obsessive-Compulsive Disorder (OCD) is a severe mental illness that affects 1–2% of the Australian population (Crino, Slade, & Andrews, 2005). There is currently no cure for OCD and current interventions are not effective to relieve symptoms in many people. Non-invasive brain stimulation techniques such as transcranial magnetic stimulation (TMS) are gaining acceptance as safe and potentially effective treatments for patients with OCD by altering network dysfunction. This collaborative clinical trial aims to investigate the efficacy of an optimised TMS protocol in OCD by targeting three main fronto-striatal pathways affected in OCD. The proposed study combines behavioural analyses, neuroimaging, and TMS to investigate the effects of treatment.

**Current Status:** Recruitment and treatment.

## Dr Karyn Richardson

BSci (Hons), DPsych

Post-Doctoral Research Fellow

Research Coordinator;  
Interventional Psychiatry

Epworth Centre for Innovation  
in Mental Health



### 2019 Grants

- Epworth HealthCare: Epworth Research Capacity Building Grant: 'Developing a novel brain stimulation treatment for post stroke depression' \$29,611, 2019–2020

### 2019 Conference Presentations

- Richardson, K. Novel Therapeutic Development for Psychiatric Disorders: Optimizing brain stimulation for the treatment of obsessive compulsive disorder. Epworth Research Week, 5–9th August 2019; Epworth Camberwell, Victoria.



## 2019 Media

- Online article: Kaur M, Richardson KE, Fitzgerald PB. Using Magnets to Stimulate the Brain Helps People With Depression Authors and reviewers: Frontiers for Young Minds. February 20, 2019. <https://kids.frontiersin.org/article/10.3389/frym.2019.00026#.XHS22S84vno.twitter>
- Community Presentation: Richardson K. Drouin Rotary Annual Dinner. Pathway to Mental Health Research. Drouin Secondary College; 5th June 2019.

## About Karyn

Dr Karyn Richardson is a Post-Doctoral Researcher and Research Psychologist. At ECIMH, Karyn is the Research Coordinator for investigator-initiated trials in the Interventional Psychiatry group, as well as the primary coordinator for the Deep Brain Stimulation for Severe Depression and Theta Burst Stimulation for Obsessive Compulsive Disorder trials. Karyn completed her Doctorate in Clinical Neuropsychology at Monash University in 2017. Her research thesis used TMS-EEG to investigate the role of cortical inhibition in the working memory deficits associated with schizophrenia. She has recently been selected to participate in the 2018 Veski 2018 inspiring women in STEM side-by-side program; Stamina, women returning to work stream. Karyn is also driven by a desire to advocate for the transformational impact women can make in STEM.

Karyn has been working with Prof Fitzgerald and A/Prof Hoy since 2016. Her research interests include developing novel biological treatments for the affective and cognitive changes that occur following stroke. She is particularly interested in developing brain stimulation protocols to treat attentional and executive dysfunction and post-stroke depression, and developing evidenced based interventions for the treatment of the cognitive dysfunction associated with mental illness.

development, grant applications, setup of new studies including ethics, honours student project supervision, conference management, budgeting and finance aspects of research. She is responsible for supporting strategic and operational processes with the goal to ensure growth and success of the division in research, teaching, learning and engagement. She provides project management, financial, human resources and general infrastructure oversight.

## Dr Natalie Thomas

BSc (Hons) PhD

Post-Doctoral Research Fellow

Women's Mental Health Division

Monash Alfred Psychiatry research centre



## 2019 Students

### Paige Gray

Bachelor of Science (Honours)

*Emotion regulation and recognition across the menstrual cycle*

### Taran Giddey

Bachelor of Medical Science (Honours)

*Peak Saccadic Eye Velocity across the Menstrual Cycle*

### Jess Le

Bachelor of Medical Science (Honours)

*Cognition, the menstrual cycle and premenstrual disorders*

**Marisha Shetty** Bachelor of Biomedical Science (Honours)

*Stress and the battle of the sexes: Can the Perceived Stress Scale measure differences in stress responses between genders?*

### Dr Carolyn Breadon

Doctorate by Research (PhD)

*Neuroendocrinology and autoimmune triggers for post-partum psychosis*

## Post-Doctoral Researchers (continued)

### 2019 Grants & Awards

- The Mohr Family/Philanthropic/The Damian Project (Kulkarni, Gurvich, de Castella, Thomas) \$200,000
- Monash University/Platform Access Grant/Metabolomic analysis for biomarker discovery in Borderline Personality Disorder (Thomas, Gurvich) \$3,800
- Australian Mathematical Sciences Institute CHOOSEMATHS award to attend AMSI BioInfoSummer at The University of Sydney, a program intended for attendees to develop their bioinformatics skills and develop national networks.

### 2019 Conference Presentation

- 2019 Inaugural Translational neuroscience symposium, Monash University Clayton, Invited key-note speaker, 'Two patients walk into the clinic: A translational psychiatry perspective'

### 2019 Media

- Interview; 'Choosemaths grant recipient profile: Natalie Thomas', 2019

### About Natalie

Dr Natalie Thomas is a Research Fellow within the Women's Mental Health Division at Monash University who works within the evolving fields of neuroendocrine research and related biomarker studies, using her interdisciplinary skills in laboratory sciences and clinical research. Dr Thomas was recruited to Monash University upon completion of her PhD studies in 2016 to work within the Department of Psychiatry, Central Clinical School (CCS). Dr Thomas provides unique molecular biology and biochemistry experience to the division, and now heads the Molecular Psychiatry Platform and biomarker research arms.

Her work involves close collaborations with psychiatry, endocrinology, psychology, and immunology and aims to characterise the neurobiological underpinnings of patient and healthy human populations and to develop blood and saliva-based biomarkers for the field of neuroscience. To this end, Dr Thomas led the establishment of and manages the Monash Alfred Psychiatry research centre (MAPrc) Psychiatric Biobank that houses comprehensive demographic, behavioural, mood, and cognitive data alongside plasma, serum, DNA/RNA, and saliva samples of both the healthy population and psychiatric patients.

### Overview Research Areas and Strategic Goals

There is a global urgency for specific and sensitive biomarkers for the objective detection of psychiatric disorders. Currently, diagnosis and treatment of psychiatric disorders is inherently difficult due to the lack of objective tests to substantiate diagnoses and because of a lack of specific treatments that target underlying pathophysiology. The addition of 'biomarkers', a "measurable characteristic of a biological state or condition that can be objectively measured" would greatly improve accuracy of diagnosis and increase our understanding of the underlying biological process leading to drug discovery.

### Featured Projects

#### Metabolomic analysis for biomarker discovery in Borderline Personality Disorder

**Investigators:** Natalie Thomas, Caroline Gurvich, Jayashri Kulkarni

**Funding Source:** Faculty of Medicine, Monash University

**Brief Description/Overview:** The neurobiological aetiology of complex-PTSD is poorly understood and subsequently, the pharmacotherapy is not clear and no specific medication is available. To advance treatment development, a clearer understanding of the aetiology is desperately required. This project provides a novel and exciting approach to advance our molecular understanding of the pathogenesis of cPTSD, and potentially inform clinical practice by identifying novel biomarkers. This project aims to identify a unique metabolomic fingerprint, using mass-spectrometry technology and bioinformatics analyses, which relate to symptoms of cPTSD, which can lead to future development of biomarkers for diagnostic purposes.

**Current Status:** Progress to date include recruitment and data collection. The metabolome differences between healthy and patient groups have been conducted which involves blood plasma collection, sample processing and preparation, mass spectrometric acquisition and manual data analysis using IDEOM, mzmine software. Bioinformatic analysis is currently underway.

# RESEARCH ASSISTANTS

## Emmy Gavrilidis

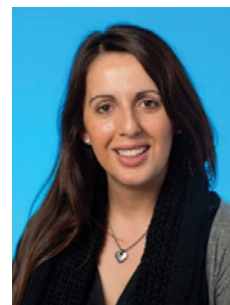
B.App.Sci

Research Manager, Women's Mental Health Division

Monash Alfred Psychiatry research centre

### About Emmy

Emmy Gavrilidis is the Women's Mental Health Division Program Coordinator at MAPrc, a position she has held since 2011. Prior to this Ms Gavrilidis was a Research Assistant (2007–2011) in the Women's Mental Health Division and coordinated a number in trials in men and women with schizophrenia, bipolar disorder and depression. While working in these roles Ms Gavrilidis developed her skills in data collection and study coordination research methodology, protocol development and staff and student supervision. She has extensive research experience and is involved in many aspects of research including project development, grant applications, setup of new studies including ethics, conference management, budgeting and finance aspects of research. She is responsible for supporting strategic and operational processes with the goal to ensure growth and success of the division in research, teaching, learning and engagement. She provides project management, ensures implementation of policies and practices, maintains budget and program expenditures as well as supports growth and program development.



## Dr Sally Herring

BA (Hons), DPsych(Clin), MAPS

Research Manager

Epworth Centre for Innovation in Mental Health

Commenced in 2017

### About Sally

Dr Sally Herring is the Research Manager of the Epworth Centre for Innovation in Mental Health, part of the ECIMH executive under Prof Paul Fitzgerald and Prof Kate Hoy at Epworth Camberwell. Sally is a clinical research psychologist, completing a professional research Doctorate of Clinical Psychology at Monash University. Her research experience is in the University and not-for-profit sectors, particularly in assisting with clinical research into new treatments for mental health disorders. Sally has worked as a Research Psychologist on novel brain stimulation treatments for depression, schizophrenia and obsessive compulsive disorder at the Monash Alfred Psychiatry Research Centre (MAPrc) and ECIMH, as a Research Fellow at the University of Melbourne on clinical trials of intensive prolonged exposure therapy and TMS for posttraumatic stress disorder, Sally has also worked with Flinders University in Central Australia as a Research Fellow in the area of remote health, and acted as a member of the Central Australian Human Research Ethics Committee (CAHREC), assisting in the review of human research ethics applications for projects conducted in government, non-government and academic sectors. Sally's research interests are in the development and translation of innovative treatments for mental health disorders.

Sally contributes to the operational, staff and research management of ECIMH, assisting with the establishment of the Centre, and its subsequent transition and expansion in 2019. Sally helps facilitate the ECIMH research program, including the clinical and experimental trials in mental health and brain disorders using brain stimulation and other innovative technologies. She supports the development of research and centre related SOPs, trial set up, facilitating ethics and governance approvals, contributing to staff training, trial coordination and clinical research assessments, and is an associate supervisor for 2 doctoral students.



## Research Assistants (continued)

### Veronica Simic

BPsychSci (Honours)

Research Officer/Project Management & Development

Epworth Centre for Innovation in Mental Health

Commenced in 2019

#### About Veronica

Veronika's role involves coordinating and delivering special projects, including coordination of the collaborative research trial Weston and the delivery of the TMS Clinical Certification course. Veronika has completed her undergraduate studies, obtaining a degree in Psychological Science (Honours). She is a Golden Key Member (for outstanding academic achievement) and was awarded a Summer Research Scholarship where she investigated the constructs involved in older adult internet super users attaining computer self-efficacy. She presented the findings of her study at the 13th Global International Conference on Ageing and is a published author. Veronika has previously coordinated oncology research trials and has also worked in a clinical mental health setting. Prior to her studies in psychology, Veronika has had various roles in all stages of business development and management.



### Dr Elizabeth Thomas

PhD

Acting Research Manager, Women's Mental Health Division

Monash Alfred Psychiatry research centre

#### About Lizzie

Dr Elizabeth Thomas is the Acting Women's Mental Health Division Research Manager at MAPrc and started this role in August 2019. Dr Thomas holds a Bachelor of Biomedical Science (Honours)/Bachelor of Science double degree (Monash University). She was awarded a PhD from Monash University in 2019, which investigated sub-clinical schizophrenia symptoms in the general population, particularly the role of genetics in cognitive symptoms. She has received a number of prestigious awards and honours for this work, including the Monash Postgraduate Publication Award, Sparrho Early Career Researcher Prize and being named a 7News Young Achiever Leadership Award semi-finalist.

Dr Thomas has a strong career background in scientific research. During her PhD, she developed her skills in data collection and research methodology, protocol development and staff and student supervision. Dr Thomas' managerial role encompasses preparation of research grants, manuscripts, reports and ethics submissions. She provides project management and oversight of the Women's Mental Health research studies, including several large clinical trials. She is also part of the organising committee for the annual In Her Shoes conference on Women's Mental Health for medical practitioners.



### Jenny Bortoli BN

Research Nurse

Psychopharmacology – Caulfield

#### About Jenny

Jenny was born in Melbourne and completed her general nurse training at St Vincent's Hospital in Melbourne. Following her general training she completed a cardiac nursing course and worked in both St Vincent's and Cabrini cardiac units. Jenny worked for a short period of time in aged psychiatry where she became interested in clinical trials for Alzheimer's disease. She has continued to work in this area since 2007.





## Ms Alexandra Conway

Bachelor of Health Science (Paramedics)  
Clinical Trial Coordinator/Research Assistant  
Women's Mental Health Division  
Monash Alfred Psychiatry research centre

### About Alex

Ms Alexandra Conway is a Clinical Trial Coordinator and Research Assistant in the Women's Mental Health division of MAPrc. Alexandra finished a Bachelor's degree in Health Science in 2018 completed at Victoria University. Alexandra joined MAPrc in 2018 where she coordinated two clinical trials: Recurrent UTI's and the use of Cranberry supplements and Phase 1 Clinical Trial in Perimenopausal Major Depressive Disorder.



## Sue Dal Sasso

RN  
Research Nurse, Psychopharmacology – Caulfield

### About Sue

Sue was born in New Zealand, grew up in Tasmania and has lived in Melbourne for 25 years. Sue completed nursing training at Launceston General Hospital, before studying complimentary medicine, including naturopathy and acupuncture. Sue began working in clinical trials 18 years ago and has worked in several disciplines. An opportunity arose to be involved in Clinical trials at APS Caulfield (including Alzheimer's studies) two years ago, which was an area of interest. Sue hopes that a new treatment will be developed in the near future to assist the people and families whose lives are terribly affected by this disease. On-going research is imperative to finding a treatment to delay the progress, cure or prevent Alzheimer's Disease, which has been elusive up to date! Sue enjoys travelling, photography and bush walking.



## Kirsten Gainsford

BAppSc(Psy), BPsySc(Hons)  
Research Assistant/Study Coordinator  
Epworth Centre for Innovation in Mental Health  
Commenced in 2016

### About Kirsten

In her role as a Research Assistant and Study Co-ordinator, Kirsten has spent the last four years working on a number of projects with ECIMH where she was responsible for the coordination of three double-blind, randomised controlled trials in clinical populations including people with schizophrenia and treatment-resistant depression. She has also worked closely with people with Alzheimer's disease and the healthy aging population.

Kirsten has experience in the use of a number neuroimaging and non-invasive brain stimulation technologies for measuring and modulating brain function. Namely, Electroencephalography (EEG) and eye-tracking and Transcranial Magnetic Stimulation (TMS), transcranial Direct Current Stimulation (tDCS) and transcranial Alternating Current Stimulation (tACS). Kirsten also has extensive experience in administering, evaluating and interpreting a number of clinical and cognitive measures.



## Research Assistants (continued)

### Weiyu Guan

B-ENVS, Master of Nursing Science  
Research Nurse, Interventional Psychiatry  
Epworth Centre for Innovation in Mental Health

#### About Weiyu

Weiyu plays a key role in the treatment administration of rTMS at ECIMH. She enjoys working collaboratively with her multidisciplinary team of colleagues to ensure research quality and participant experience. She also assists in fostering partnership with research participants and carers, as well as safeguarding them with her knowledge, experience and care.

Weiyu completed her Bachelor of Environments and Master of Nursing Science at the University of Melbourne. Driven by her passion for the arts and holistic health, she is currently studying part-time at The MIECAT Institute for her master's degree in therapeutic arts practice.



### Kate Gunningham

(Hons, BA), ANU  
Research Officer/Study Coordinator, Interventional Psychiatry  
Epworth Centre for Innovation in Mental Health

#### About Kate

Kate holds an honours degree in psychology from the Australian National University. Her experience includes three years coordinating psycho-oncology trials at the University of Sydney's Centre for Medical-Psychology Evidenced-Based Decision Making (CeMPED), focusing on the role of exercise and sexuality in survivorship. Currently she is the study coordinator and research officer for the You-tACS study at the Epworth Centre for Innovation in Mental Health. Kate's role involves administering cognitive, psychometric and EEG assessments, ethics and funding applications, participant recruitment, media and stakeholder engagement, data collection and data analysis. The You-tACS study aims to better understand the effects of tACS in modulating/entraining brain waves and whether modulation translates into reduced depression severity and enhanced cognition for people with Major Depression Disorder.



### Lisa Hewett

Endorsed Enrolled Nurse  
Research Nurse  
Epworth Centre for Innovation in Mental Health

#### About Lisa

Lisa is an Endorsed Enrolled Mental Health Nurse and has worked within Epworth Clinic's inpatient unit and clinical TMS service since 2016. Lisa commenced her role in delivering rTMS at ECIMH in 2019. She uses her specialised skills to support participants and their carers through every step of the study treatment pathway. While ensuring that treatments are delivered safely and effectively, Lisa's priority is the care and comfort of ECIMH participants and their carers.



## Rachel Hughes

BPsych (Hons)

Research Officer/Clinical Trials Coordinator, Interventional Psychiatry

Epworth Centre for Innovation in Mental Health

### About Rachel

Rachel is a Clinical Trials Coordinator at the Epworth Centre for Innovation in Mental Health. She has experience in all aspects of managing both investigator-initiated and commercially sponsored trials. This includes the setup of multifaceted trials, CRA/Sponsor/external vendor liaison, cognitive/psychometric assessments with multiple clinical populations, ethics and funding applications, participant recruitment, data collection and analysis. Rachel also holds qualifications in lab sample processing, ERT ECG Cardiac Safety and an IATA certification. Rachel is a member of the Australasian Brain Stimulation Society. Rachel is currently the lead study coordinator on multiple commercially sponsored trials within ECIMH, investigating adjunctive pharmacological treatments for participants with Major Depressive Disorder.



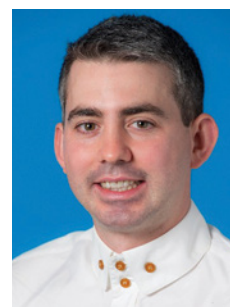
## Gregory Humble

Research Assistant, Interventional Psychiatry

Epworth Centre for Innovation in Mental Health

### About Gregory

Greg is a research assistant involved in both investigator-initiated and commercially sponsored trials in the Investigational Psychiatry group. Within his role he coordinates the BrainAmp closed-loop tACS trial, as well as assisting in a commercially sponsored trial of a novel pharmacological agent for use in treatment resistant major depression. During his honours year he developed a keen interest in EEG neuroimaging and data analysis and has played a key role in analysing EEG and TMS-EEG data under the stewardship of Prof. Kate Hoy and Dr. Neil Bailey. He holds two honours degrees, completing his most recent earned him an upper first-class honours degree in human pathology (neuroscience) from Monash University. He has gained numerous awards in his BSc undergraduate, including top student for his nominated major (neuroscience) as well as being listed on the Dean's honours list for being in the top 20 academically performing students across all undergraduate science disciplines. Further, he has completed multiple selective entry courses in neuroimaging and data science (CHDSS at Melbourne University, Neurohackademy at University of Washington eScience Institute), and actively continues to further his understanding of complex neuroimaging and data analysis. Greg is actively involved in running code club tutorials within the ECIMH team to facilitate honours and PhD students' understanding of the subject.



## Research Assistants (continued)

### Bridget Kennedy

B.A., GradDipPsych

Research Assistant/Study Coordinator

Epworth Centre for Innovation in Mental Health

Commenced in 2018

#### About Bridget

Bridget Kennedy is a research assistant and study coordinator at the Epworth Centre for Innovation in Mental Health. She completed her Bachelor of Arts at the University of Melbourne in 2015, and Graduate Diploma of Psychology at Deakin University in 2016. Bridget has worked and volunteered in healthcare, community support, and research settings, and has experience working with various populations including families and children affected by disability and mental illness, oncology and dialysis patients, individuals experiencing depression, and people diagnosed with Alzheimer's. She currently coordinates the tACS for Alzheimer's trial, which investigates the efficacy of Transcranial Alternating Current Stimulation (tACS) as a treatment for mild Alzheimer's disease. This study also examines patient and care-partner experience of the treatment, which is expected to improve the device usability and its translation into clinical practice. Bridget's favourite part of her role is conducting psychometric and cognitive assessments, and engaging with participants and their families. She has been involved in numerous recruitment and community outreach presentations, and was selected to present for tACSALZ at the 2019 Epworth Research Week poster presentation evening.



### Ms Iris Liang

Research Assistant

Women's Mental Health Division

Monash Alfred Psychiatry research centre

#### About Iris

Iris is a Research Assistant within the Women's Mental Health Division. Iris graduated with a Bachelor of Science degree at the University of Melbourne majoring in human anatomy and physiology, and completed her research thesis with first class honours. Based at the Melbourne Brain Centre in the Royal Melbourne Hospital, her Honours research examined the correlation of different imaging modalities in patients treated with intra-arterial therapy following acute ischaemic stroke. Following this, Iris joined MAPrc in 2018 where she coordinates two clinical looking at therapeutic intervention in the treatment of complex trauma disorder. As part of her role, Iris oversees participant recruitment and administering of neuropsychological assessments.



### Andrea Marcu

BPsychSci, GradDip (Psych)

Research Assistant

Epworth Centre for Innovation in Mental Health

Commenced in 2019

#### About Andrea

As a Research Assistant at ECIMH Andrea has worked in a support role, and trained in a number of clinical and cognitive assessment tools for trials of Theta Burst Stimulation in the treatment of Obsessive-Compulsive Disorder and Transcranial Magnetic Stimulation in the treatment of Alzheimer's Disease.





## Aleksandra Miljevic

BPsych (Hons)

Research Assistant & Study Coordinator

Epworth Centre for Innovation in Mental Health

Commenced in 2019

### About Aleks

In her role as a Research Assistant and Study Coordinator, Aleks works on a project within ECIMH where she is responsible for the coordination of a randomised controlled trial in the clinical population of treatment-resistant depression. Aleks has experience in the use of a number of neuroimaging and non-invasive brain stimulation technologies for measuring and modulating brain function. Namely, Electroencephalography (EEG), Transcranial Magnetic Stimulation (TMS), transcranial Direct Current Stimulation (tDCS) and transcranial Alternating Current Stimulation (tACS). Aleks also has extensive experience in administering, evaluating, and interpreting a number of clinical and cognitive measures.



## Fenny Muliadi

B.A Neuropsychology

Research Assistant/Neuropsychologist, Psychopharmacology – Caulfield

### About Fenny

Fenny was born in Jakarta, Indonesia and moved to Melbourne in 1996. Fenny studied for her psychology degree at the University of Melbourne and neuropsychology degree at Latrobe University. She has been working in Clinical Trials at Caulfield Hospital since 2016 and recently began working at the Alfred site as well. Fenny undertakes study coordination and cognitive rating for Alzheimer's disease and depression studies. She enjoys the continuing contact with participants in clinical trials and the support this provides for both them and their study partners.



## Linda Pearce

Research Nurse

Epworth Centre for Innovation in Mental Health

### About Linda

Linda came to ECIMH in 2019 as an experienced clinical mental health nurse who had previously worked in the Therapeutic Brain Stimulation team at MAPrc, and at Epworth HealthCare, including establishing the Epworth Clinic TMS program. As a Research Nurse at ECIMH, Linda is primarily responsible for administering treatment for patients with depression, obsessive compulsive disorder and Alzheimer's disease using a variety of brain stimulation techniques. She contributed substantially to establishing the research TMS program at ECIMH, developing procedures, documentation and manuals, and training treating nurses on the research protocols. Linda also contributes to the ECIMH TMS certification course for external clinicians as a trainer and assessor.



## Research Assistants (continued)

### Megan Ross

BA (Hons)

Research Assistant

Epworth Centre for Innovation in Mental Health

Commenced in 2017

#### About Megan

Megan Ross is a casual research assistant ECIMH and has been a part of the team since 2017. She has research experience in various areas including Depression and Obsessive-Compulsive Disorder, homelessness, and Telehealth and mHealth programs. Megan's interests lie in the areas of knowledge translation, the role of policy in healthcare and the impact of gender on the lived experiences of health. Megan is a member of the Australasian Brain Stimulation Society.



### Steven Steele

RN (Div 1)

Research Nurse

Women's Mental Health Division

Monash Alfred Psychiatry research centre

#### About Steven

Steven is a Division 1 Registered Nurse and his nursing experience includes four years' emergency department nursing in both the UK and Australia, including with the ED department of Europe's largest teaching hospital.



### Freya Stockman

BPsychSci, GradDip (Psych)

Research Assistant/Clinical Trial Coordinator

Epworth Centre for Innovation in Mental Health

Commenced in 2018

#### About Freya

Ms Freya Stockman is a Research Assistant and Clinical Trial Coordinator in the Therapeutic Brain Stimulation division of MAPrc and ECIMH. Since the beginning of 2018, Freya has coordinated two clinical trials: using theta-burst stimulation for the treatment of fibromyalgia (chronic pain symptoms); and using transcranial alternating current stimulation (tACS) for the treatment of mild cognitive impairment (MCI).

During this time, Freya has also developed portable brain stimulation treatment kits to enable patients to apply treatment at home. Key skills include large scale project management, high pressure recruitment, conducting clinical assessments, brain stimulation administration, collecting data, and educational community outreach. Freya is also a published author of an international book regarding treatment for Autism Spectrum Disorder (ASD).

Freya completed her Bachelor degree in Psychological Science (2016) and Graduate Diploma of Psychology (2017) at Deakin University. Her graduate thesis examined the relationship between mirror neuron activity and empathy using transcranial magnetic stimulation, as well as assessing the relevance of intelligence in social inferencing as part of the Cognitive Neuroscience Unit (CNU).



## Caley Sullivan

BA (Psychology), BSc (Biomedical Science, Hons 1st Class)

Research Officer, Technology

Epworth Centre for Innovation in Mental Health

### About Caley

Caley specializes in neurophysiology, neuroimaging, data analysis advanced signal processing across multiple modalities. He is a skilled and experienced programmer and has written software for PC, micro-controllers, and embedded Linux. Has experience prototyping hardware and device development, including CAD modelling and design for manufacture. As research officer technology at the ECIMH he develops novel hardware and software solutions, towards new and improved methods of therapeutic brain stimulation and better patient outcomes.

Caley works across a broad range of therapeutic brain stimulation studies, employing various techniques/technologies including transcranial Alternating Current Stimulation (tACS), transcranial Random Noise Stimulation (tRNS), transcranial Direct Current Stimulation (tDCS), Transcranial Magnetic Stimulation (TMS), Theta-Burst Stimulation (TBS), Electroencephalography (EEG), functional Near Infrared spectroscopy (fNIRS), Deep Brain Stimulation (DBS), Magnetic Resonance Imaging (MRI) and Neuronavigation.



## Ms Alisa Turbić

Research Assistant

Women's Mental Health Division

Monash Alfred Psychiatry research centre

### About Alisa

Alisa is a Research Assistant with the Women's Mental Health Division. Alisa spent the majority of her career working as a Senior Research Assistant at the Melbourne Brain Centre at The University of Melbourne where she managed research projects examining the factors that may be exploited to promote repair of the nervous system following brain injury and disease. She transitioned to public health research in 2016 by obtaining a position in the School of Public Health and Preventative Medicine at Monash University and subsequently commenced her position at MAPrc in May 2018. To date, she has contributed to several research projects, which have led to a number of peer-reviewed publications and presentations at professional conferences, nationally and internationally.



## Jenny Ung

BN, Grad Cert. Mental Health

Research Nurse, Psychopharmacology – Caulfield

### About Jenny

Jenny completed her Nursing degree at LaTrobe University. She went on to become a registered psychiatric nurse and worked in this area for several years. She joined the Clinical Trials Unit at Caulfield Hospital in 2015 as a cognitive rater, which opened the door to becoming a study coordinator as well. Jenny is currently working on studies that are testing new treatments for Alzheimer's disease and depression.



## Research Assistants (continued)

### Bee Williamson

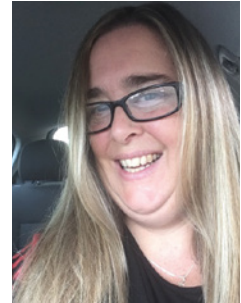
Bach of Visual and Performing Arts, Victorian College of the Arts, Uni of Melbourne,  
Certificate IV in Small Business Management, RMIT  
Lived Experience Consultant

#### About Jenny

Bee is a poet, artist and designer. In 2011 she set up her own publishing company, Bee's Boutique Books. She has written and/or designed more than 17 books.

In MH Bee was a peer support leader for 3 years in S.M.A.R.T research, led by Prof. Neil Thomas in conjunction with Swinburne and Wellways. Now, for the past 3 1/2 years she is part of the LEAP panel in P.E.R.I.S.C.O.P.E, with the Swinburne psychology research team. And just for fun, Bee has had 4 films in the Schizy Inc Mojo Film Festivals, in the last four years. She is a part of Schizy Inc committee which is run by Heidi Everett. At the opening of the 2011 MAPrc art auction and exhibition at Obscura Gallery, Balaclava, she was invited to speak alongside Prof. Jayashri Kulkarni. Since 2010 Bee has been part of many research trials with MAPrc, including Healthy Lifestyles. She has attended sessions at the Voices Clinic. Because of her schizo-affective disorder she was unable to follow her dream of theatre direction, but she was involved in RAG Theatre, Swimming in my Head and Woman's Word, theatre projects run by the City of Port Phillip, for women experiencing mental illness (2009–2006). Since 2004 Bee has been part of 26 exhibitions of photography & artwork.

Books: [www.beesboutiquebooks.biz](http://www.beesboutiquebooks.biz) Art & Design: [www.hive.id.au](http://www.hive.id.au)





# ACADEMIC PSYCHIATRISTS

## Dr Carolyn Breadon

MBBS/BA (Hist), MP, FRANZCP,  
ATCL

Academic Psychiatry Teaching

PhD Candidate



### About Carolyn

Carolyn provides regular teaching on perinatal psychiatry in lectures and tutorials to Monash medical students. She has given two Grand Round presentations at The Alfred Hospital, firstly on autoimmune encephalitis and secondly on emerging hormone-based treatments for mental ill-health, a study which will be conducted at MAPrc in the new year. Carolyn completed her psychiatry training at The Alfred HIV Service and The Royal Women's Hospital, and subsequently worked at the Sunshine Women's and Children's Service and the Werribee Mother Baby Unit, before moving to MAPrc in 2017 to commence a PhD in post-partum psychosis under the supervision of Professor Kulkarni and Dr Natalie Thomas.

### Role performed at MAPrc

With the able assistance of Rachana Pattali and, before her, Cindy Yu, Carolyn set up the Perinatal Psychiatry Clinic to provide advice to GPs and women with major mental illnesses, such as schizophrenia and bipolar affective disorder, who are contemplating pregnancy. The clinic has proven very popular and has provided an additional arena for medical students and registrars to see pregnant women and new mothers with their babies who must consider treatment with psychiatric medications during the course of their pregnancy.

### Research Interests/Activities

Carolyn's research interests lie in perinatal psychiatry, examining the relationship between hormone changes in pregnancy and at delivery, and mood and mental state fluctuations throughout the perinatal period. She works with Alisa Turbic on the National Register of Antipsychotic Medications in Pregnancy (NRAMP), and with large data sets from the Victorian Government and Sunshine Hospital, evaluating the effect of antipsychotic medication treatment on the physical health of mothers and their babies.

During this year Carolyn has contributed a chapter on Antipsychotics in Pregnancy to "Perinatal Pharmacotherapy", published by the Springer academic press, and a review article on the safety of antipsychotics in pregnancy to the journal Expert Opinion on Pharmacotherapy. She has travelled to the University of West Australia, Helen Mayo House in South Australia, Monash Medical Centre, Sunshine Hospital and The Albert Road Clinic, to provide education about psychiatric medication safety to psychiatrists, midwives, obstetricians and GPs. She has presented preliminary data at the Marce Perinatal Mental Health Conference in Bangalore in September 2018 on increased rates of morbidity for women and their babies exposed to antipsychotic medications in pregnancy at Sunshine Hospital.

### 2019 Students/Volunteers

**Ms Lonneke Walraven**, a final year medical student from The Netherlands, travelled to Melbourne for 3 months to work closely with Carolyn and with Dr Hudaib to evaluate methods of assessment for the NRAMP babies as they turn 3 and 5 years old. Lonneke's work will be used to inform the next stage of research at MAPrc on developmental trajectories of babies exposed to antipsychotic medication in utero.

### Featured Projects

**Retrospective review of maternal and infant morbidity at Sunshine Hospital**

**Investigators:** Professor Glyn Teale (Western Health), Professor Jayashri Kulkarni (Monash University), Dr Carolyn Breadon, Ms Alisa Turbic, Dr Abdul Hudaib

**Duration:** Commenced February 2018

**Method/Design:** Retrospective review of outcome data recorded by midwives and medical officers through pregnancy and at delivery

**Status:** This large data set examining outcomes for 47,700 women and their babies over 10 years suggests that women taking antipsychotic medication in pregnancy are much more highly vulnerable to other sources of risk, including illicit drug use, smoking, and polypharmacy. Women taking antipsychotics and antidepressants in pregnancy are more likely to be obese, have pre-pregnancy diabetes or to develop gestational diabetes in pregnancy. They have higher rates of interventional delivery and of caesarean section delivery. Their babies are much more likely to suffer medication withdrawal and respiratory distress symptoms at delivery. These babies are more likely to be admitted to the Special Care Nursery and have lower rates of breastfeeding at discharge from hospital.

### The National Register of Antipsychotic Medications in Pregnancy (NRAMP)

**Investigators:** Professor Kulkarni (Monash University), Dr Carolyn Breadon, Ms Alisa Turbic

**Funding:** A non-directive grant from Janssen-Cilag which provides funding for a part-time research coordinator

**Duration:** 2006–ongoing

**Background:** The NRAMP cohort comprises women taking antipsychotic medications in pregnancy who are then followed up throughout pregnancy and through the first year post-partum.

**Aims:** To ascertain whether women and babies exposed to antipsychotic drugs during pregnancy are more vulnerable to adverse metabolic or obstetric outcomes through pregnancy and at delivery or the post-partum.

**Method/Design:** Both women and their babies are contacted for assessment at specific time points during this period to evaluate their mental and physical health, as well as to track the babies' developmental progress.

**Status:** Researchers are currently following up on the 2014 paper published at MAPrc presenting results for the first 100 babies and their mothers with a similar project presenting results for the first 300 babies and their mothers. In the next year researchers hope to further evaluate sub-groups within this cohort, specifically examining outcomes for women taking clozapine during pregnancy and their babies.

### The Victorian Data Linkages Project: maternal psychiatric and physical comorbidity at the point of delivery

**Investigators:** Professor Glyn Teale (Western Health), Professor Kulkarni (Monash University), Dr Carolyn Breadon, Ms Alisa Turbic

**Funding:** no external funding has been provided for this project

**Duration:** Commenced July 2018

**Background:** pregnancy, delivery and the post-partum represent a period in women' lives of very high risk for mental health difficulties.

**Aims:** This project aims to map the incidence of maternal mental health morbidity and diagnosis in the year after delivery of a baby, to examine differences in the rates of incidence and patterns of diagnoses made.

**Method/Design:** Data set of the past decade provided by the Victorian Government, providing a state-wide snapshot of maternal mental health morbidity dat

**Status:** data currently under analysis

## Dr Leo Chen

MBBS, M.Psych, FRANZCP, AFRACMA

Academic Psychiatry Teaching

MBBS teaching, Psychopharmacology Group

PhD Candidate

Commenced in 2017



### 2019 Grants

- Researcher Capacity Building Grant 2019, Epworth Medical Foundation. Project: Accelerated theta burst transcranial magnetic stimulation for depression. \$30,273.72

### About Leo

Dr Chen is a registered medical practitioner, Fellow of the Royal Australian and New Zealand College of Psychiatrists (FRANZCP) and Associate Fellow of the Royal Australasian College of Medical Administrators (AFRACMA). He is in clinical practice at Alfred Health and Epworth Camberwell and is Director of the Transcranial Magnetic Stimulation (TMS) Program at Epworth HealthCare.

Dr Chen's role at MAPrc combines clinical medical/psychiatric, research and teaching activities. He provides clinical oversight for interventional trials at MAPrc. He is undertaking a PhD researching improved efficacy and efficiency of TMS in the treatment of depressive disorders.

Dr Chen is actively involved in psychiatry teaching as a lecturer, tutor, examiner and engaged in Monash University's Psychiatry Academy responsible for reviewing and developing the university's psychiatry curriculum. Dr Chen is also the Coordinator of a RANZCP-accredited Professional Peer Review Group attended by TMS psychiatrists around Melbourne.

Dr Chen's research interests revolve around addressing clinical questions arising from treating patients with TMS. He is investigating the science behind novel methods to make TMS therapy more effective and efficient in the treatment of depression and translating these into clinical trial applications at MAPrc and the Epworth Centre for Innovation in Mental Health (ECIMH). More broadly, Dr Chen aspires to contribute to the development of treatment innovations that translate to meaningful outcomes for persons living with mental illnesses.

### Overview of Research Interests/Activities

Dr Chen's research aspiration is to contribute to the development of innovative treatments that translate to meaningful outcomes for persons living with mental illnesses. My approach emphasises clinical trials that can be scaled across local and international research networks to encourage multi-site collaboration and, in-turn, derive clinically meaningful and generalisable outcomes. To this end, Dr Chen is Coordinating Principal Investigator of a large-scale, definitive, multi-site clinical trial comparing the accelerated application of a novel form of TMS therapy to treat depression.

This trial is currently underway at 4 sites across 3 Australian states. He is also Sub-Investigator/Principal Investigator for several industry-sponsored interventional trials at MAPrc investigating the therapeutic potential of novel pharmacological agents.

### Featured Projects

#### Accelerated theta burst transcranial magnetic stimulation for the treatment of depression

**Investigators:** Dr Leo Chen, Professor Paul Fitzgerald

**Funding Source:** In-kind support from MAPrc, external funding from the Epworth Medical Foundation.

**Brief Description/Overview:** large-scale, definitive, multi-site clinical trial comparing the accelerated theta-burst TMS interventions of two intensities to standard once daily TMS to evaluate its relative effectiveness and rapidity of antidepressant effect.

**Status:** Recruitment is ongoing. Preliminary analysis indicates TBS exhibits equivalent antidepressant efficacy as standard rTMS. The preliminary analysis was presented at the RANZCP Section for ECT and Neurostimulation Conference in August 2018.

#### Efficacy, Efficiency and Safety of Repetitive Transcranial Magnetic Stimulation Applied More Than Once A Day in Depression: A Systematic Review

**Investigators:** Leo Chen, Abdul Rahman-Hudaib, Kate E. Hoy, Paul B. Fitzgerald

**Funding Source:** In-kind support from MAPrc

**Brief Description/Overview:** Conduct a systematic review of the literature pertaining to rTMS applied more than once a day in the treatment of depression and conduct a quantitative analysis of its effect size, over once-daily and/or sham rTMS. Efficacy, efficiency and safety outcomes of more once daily rTMS are reviewed. Significance of study findings are to contribute to evidence base in so called accelerated rTMS regimens and in turn inform clinical decision-making.

**Status:** Under review.

#### A Phase 2 Clinical Trial of PRAX-114 to Assess the Safety, Tolerability, Pharmacokinetics, and Efficacy in Participants with Major Depressive Disorder

**Investigators:** Leo Chen, Venu Kulkarni, Anthony de Castella, Jayashri Kulkarni

**Funding Source:** Praxis Precision Medicines Australia Pty Ltd

**Brief Description/Overview:** A Phase 2 clinical trial testing the hypothesis that augmenting GABAA receptor neurotransmission, following administration of PRAX-114, can provide therapeutic benefit to patients with MDD. Study goals are to establish the safety, tolerability, pharmacokinetics and efficacy of PRAX-114 in patients with major depressive disorder.

**Status:** Recruiting.

# TEACHING ADMINISTRATION

## Dr Sarah Rotstein

DMBBS (Hons), MPM GCertClinEd  
GCertArts

Co-Curriculum and Assessment  
Lead for Psychiatry at the Monash  
School of Medicine and Academic  
Coordinator for 4C Psychiatry  
Teaching at Alfred Health



### About Sarah

Dr Sarah Rotstein is an advanced psychiatry registrar and has a strong passion for women's mental health, doctor's mental health, education and advocacy. Sarah completed her MBBS at Monash University in 2011, her Masters of Psychiatry in 2016, a Graduate Certificate of Arts in 2017, a Graduate diploma of Clinical Education in 2018 and is a current PhD student with project topic 'Medical Student Stigma Against Psychiatry'.

### Role performed at MAPrc

Since 2017, Sarah has been working with Monash University (based at MAPrc) as the Curriculum and Assessment Co-Lead for Psychiatry Teaching within the Monash School of Medicine and was appointed the Education Senior at MAPrc in 2019. In addition, Sarah was the Women's Mental Health Registrar at the Monash Alfred Psychiatry Research Centre for the first half of 2019 and worked clinically in the Women's Mental Health Clinic and Perinatal Psychiatry Clinic. Over the last year, Sarah has been working on the Women's Mental Health Online Short Course that will launch in 2020 and coordinated the In Her Shoes Conference in 2019.

### Research Interests/Activities

Sarah's research interests include health and medical education, stigma and attitudes towards psychiatry, women's mental health and doctor's mental health. Sarah has a passion for Shakespeare, philosophy of mind and the history of psychiatry and has published an article considering the relationship between the history of Hamlet performance and the history of psychiatry. Sarah's passion for both sciences and humanities provides her with a unique perspective on mental health and illness.

## Anne Crawford

B.SocSci (Hons)

Student Administrative Officer/  
MD Clinical Site Administrator



### About Anne

Before starting with MAPrc in 2009, Anne was employed at the Royal Children's hospital for six years in the Audiology Department, firstly as an administrative assistant, and then relieving department administrative manager. Anne has been with MAPrc for over ten years now as the local MD Clinical Site Administrator at the Alfred Hospital. For the four years from June 2010 her role expanded to include that of the Central Discipline Administrator for Monash University MBBS Psychiatry teaching. Anne was based partly at the Monash Medical Centre during this time. In July 2014 Anne changed to part-time employment with MAPrc, based at Alfred Health. Her current role includes that of local MD Clinical Site Administrator for the psychiatry teaching program, as well as providing general administrative support to the MAPrc family.

### Role Performed at MAPrc

The MD Clinical Site Administrator is responsible for facilitating the smooth running of the Monash University MBBS Psychiatry teaching program, in compliance with the Medicine, Nursing, & Health Sciences Faculty guidelines and requirements. In liaison with Dr Sarah Rotstein (our Clinical Site Coordinator), Anne organises the local psychiatry teaching program at Alfred Health. We have four groups of students over the course of each year. For each of these groups Anne arranges a week-long hospital orientation program, schedules clinical placements for the students across a variety of Alfred Psychiatry clinics as well as Malvern Private Hospital, organises a comprehensive tutorial program, and provides support to the students. "We have a great teaching team at MAPrc and my administrative role within the team is an enjoyable and extremely rewarding one."



## Tiffany Davis

Administrator



### About Tiffany

Tiffany's background is primarily within the arts and humanities. Having trained to a high level in ballet, piano, flute and voice, she was motivated by the discipline of these pursuits as much as the creative expression. Majoring in English Literature and Cinema Studies at the University of Melbourne she went on to hone her performing skills via a Bachelor of Performing Arts and the St. Martin's Youth Scholarship Program.

Since then, her work has been a counterpoint of creative pursuits and immersion in the corporate, not-for-profit and University sectors, interwoven with special events management, communications, stakeholder engagement, sponsorship, fundraising and business development.

### Role Performed at MAPrc

Tiffany first worked with MAPrc in 2014, coordinating the de Castella Run 2 Mend Minds, the centre's biggest fundraising event. This role was expanded to include fundraising, donor stewardship, events and communications. Tiffany has since worked for the Central Clinical School in the Communications Department and in 2019 joined our team as a part-time administrator. This role includes communications as well as administration of the MD MED4190 end-of-year Objective Structured Clinical Exams (OSCEs).

## Miss Amy Laslett

BA

Administrative Assistant

Women's Mental Health Division

Monash Alfred Psychiatry  
research centre



### About Amy

Amy studied a Bachelor of Arts at Monash University, majoring in History.

In 2018, Amy joined our Year 4 team as a part-time Administrative Assistant during the final year of her degree. This role involved providing support to Professor Jayashri Kulkarni and Dr Sarah Rotstein in assisting with organising the end of year clinical exams (OSCEs) for Year 4C Psychiatry, and representing our team at relevant Faculty Committee meetings.

In 2019 Amy's role expanded when she was also employed as an Administrative Officer by the Monash University Central Clinical School at the Alfred Hospital for the Final Year Medical Student program (across all disciplines), whilst still providing part-time support to our team.

# MAPrc ADMINISTRATION

## Aileen McInerney

Executive Assistant to  
Professor Jayashri Kulkarni



### About Aileen

I have worked for several years in administrative support roles in corporate, not for profit, and health settings, and joined MAPrc in May 2018 as Executive Assistant to Prof. Jayashri Kulkarni.

### Role Performed at MAPrc

I am responsible for managing the Professor's busy and everchanging schedule, managing travel and events, assisting with the coordination of the Women's Mental Health Clinic, managing patient appointments and providing support in all areas of administration.

At MAPrc no two days are the same and it's a pleasure being part of a dynamic, committed and passionate team.

## Marcia Scott

Executive Assistant to  
Professor Jayashri Kulkarni



### About Marcia

Marcia has a background in Marketing, Business Management and Psychology. She has previously been employed in various roles with Alfred Health and joined MAPrc in July 2019 as Executive Assistant to Prof. Jayashri Kulkarni.

### Role Performed at MAPrc

The Executive Assistant role involves providing high-level assistance and administrative support in a very busy, exciting and challenging environment. This support includes assisting with the coordination of the Women's Mental Health Clinic and with the organisation of various events, as well as managing Professor Kulkarni's calendar and travel arrangements.

## Venu Kulkarni

Administration Assistant



### About Venu

I am an Allied Health Professional with a broad clinical experience having worked in India and the United Kingdom. Commencing my career as a Physiotherapist in India, I primarily worked in the Intensive Care Unit and Cardiac Recovery Unit while also managing the outpatient department. Whilst working for the NHS in the UK, I successfully supervised staff and implemented the non-clinical organisation within the department such as maintaining stock, facilities and the therapy environment, assisting with the coordination and support of other therapy assistants and liaising with multiple services to ensure smooth functioning across the service. With a growing interest in the broader health sector, management and leadership, I decided to pursue my post-graduate education in Health Management in Australia. Having recently obtained a Graduate Diploma in Health Management from Monash University, I aim to study further to receive my master's degree in the near future.

### Role Performed at MAPrc

As an Administration Assistant, I currently support the Research Manager with the day-to-day operational management of the centre. This includes assisting with financial management such as credit card transactions, payment of invoices and petty cash management and reconciliation for the Dept of Psychiatry – CCS. I also assist with HR processes such as onboarding new staff and setting up access for new staff to the centre. Additionally, I also help staff and students with any administrative tasks, queries and issues that they might have.

I try and ensure that the centre runs smoothly by ordering new equipment and supplies, organising the maintenance and repair of existing equipment, and liaising with multiple service providers. My role also involves managing reception duties, wherein I help callers with their queries and take messages. I ensure that visitors to the centre are made to feel comfortable and welcome by greeting them in a friendly and respectful manner. I enjoy working in the active and dynamic environment that MAPrc offers.

## Rachana Pattali

Clinic and Project Coordinator



### About Rachana

Rachana is a seasoned healthcare professional, with an MBA degree in Health and Hospital Management, a Bachelor's degree in Pharmacy and a Certificate III in Business Administration from Melbourne Polytechnic. Rachana managed business operations and customer relations as a pharmacist for two years and worked as a volunteer at Royal Prince Alfred Hospital in the Lung Health Promotion Centre for over a year.

### Role Performed at MAPrc

Rachana is currently working as the Clinic Coordinator for the Women's Mental Health Clinic and the Perinatal Psychiatry clinic at the Monash Alfred Psychiatry Research Centre. She is the key liaison between healthcare specialists and patients of the clinic.

Her role also involves managing customer relations, maintaining our healthcare database, and coordinating the day to day operations of the clinic. Rachana manages the relevant administrative functions, including critical billing activities, reconciliations, and period-end closures. Rachana enjoys working in this collaborative and progressive clinical setting which prioritises commitment to quality patient outcomes. Managing a busy specialist clinic requires strong organisational skills, flexibility and problem-solving skills which are the key attributes Rachana possesses. She ensures patients with complex clinical needs feel supported at the practice.

In addition, Rachana is also the Project Coordinator for the HMST project and, in this role, coordinates with GPs and patients in remote and regional Victoria to facilitate patient appointments remotely via the Telehealth platform. Rachana has been pivotal in training clinicians and patients (especially elderly patients) in using the Telehealth platform. This has enabled the delivery of services to patients in remote and regional Victoria.

# ECIMH ADMINISTRATION

## Julia Scandrett

Personal Assistant to  
Prof Paul Fitzgerald



### About Julia

Julia acquired extensive work experience in a number of fields including sales, importing and retail before finding a cultural fit within the healthcare sector.

After completing an industry qualification at Holmesglen TAFE, Julia gained experience in general practice before commencing at Epworth Camberwell in 2017 and joining the team at ECIMH in 2019.

### Role Performed at MAPrc

Julia provides administrative support to Prof Paul Fitzgerald across his clinical, research and administrative activities. She also supports the wider ECIMH staff and student team with administrative and operational responsibilities, event coordination, and the organisation and administration behind the ECIMH Brain Stimulation Certification courses.



# HDR STUDENTS

## Ellie Aniulis

PhD Candidate, **MAPrc – Body Image Research Group**  
 Supervisor: Dr Nicole Thomas & Dr Gemma Sharp  
 Project title: Slim Picking: Attentional bias toward thin bodies



## Dr Carolyn Breadon

PhD Candidate, **MAPrc – Women's Mental Health**  
 Supervisor: Prof. Jayashri Kulkarni & Dr Caroline Gurvich  
 Project title: Neuroendocrinology and autoimmune triggers for post-partum psychosis.



## Mr Sean Carruthers

PhD Candidate, **MAPrc – Cognitive Neuroscience Unit**  
 Supervisor: Dr Caroline Gurvich  
 Project title: Executive functioning and the muscarinic system in schizophrenia.  
 PhD submitted 2019



## Xianwei Che

PhD Candidate, **ECIMH – Pain, Addiction and Mental Health**  
 Supervisor: Dr Bernadette Fitzgibbon  
 Project title: Investigating the influence and mechanisms of social support on pain experience.



## Dr Leo Chen

PhD Candidate, **ECIMH – Interventional Psychiatry**  
 Supervisor: Prof. Paul Fitzgerald & Assoc. Prof. Kate Hoy  
 Project title: Investigating the efficiency and efficacy of repetitive transcranial magnetic stimulation in depression



## Robert Cooper

PhD Candidate, **ECIMH – Interventional Psychiatry**  
 Supervisors: Prof. Paul Fitzgerald & Assoc. Prof. Kate Hoy  
 Project title: Effects of frequency on enhancement & modulation of neural oscillations using brief transcranial alternating current stimulation (tACS).



## Hannah Coyle

DPSych, **ECIMH – Interventional Neuropsychology**  
 Supervisor: Assoc. Prof. Kate Hoy & Dr Neil Bailey  
 Project title: The relationship between cortical activity and cognitive function after traumatic brain injury.



## Marie-Claire Davis

PhD Candidate, **ECIMH – Interventional Neuropsychology**  
 Supervisors: Assoc. Prof. Kate Hoy & Prof. Paul Fitzgerald  
 Project title: Transcranial alternating current stimulation for apathy in Huntington's disease.



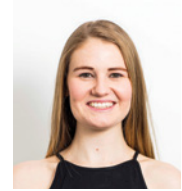
## HDR Students (continued)

### Kirsten Gainsford

PhD Candidate, **ECIMH – Interventional Neuropsychology**

Supervisor: Assoc. Prof. Kate Hoy & Dr Bernadette Fitzgibbon

Project title: Transforming treatments for schizophrenia: Virtual reality, brain stimulation and social cognition.



### Tanya Gilmartin

PhD Candidate, **MAPrc, Hormones & Cognition Group**

Supervisors: Dr Gemma Sharp & Dr Caroline Gurvich

Project title: The relationship between dimensional models of personality pathology and disordered eating behaviour.



### Andrea Marcu

PhD Candidate, **ECIMH – Interventional Neuropsychology**

Supervisor: Dr Neil Bailey

Project title: Investigating EEG correlates of attention in ADHD, healthy controls, and meditators.



### Pascale Maynard (Glasgow University)

Masters, **MAPrc – Body Image Research Group**

Supervisors: Dr Jude Stevenson & Dr Gemma Sharp

Project Title: Private Matters: An exploration of the relationship between genital knowledge, genital image, and sexual self-concept.



### Jessica Michael

PhD Candidate, **ECIMH – Pain, Addiction and Mental Health**

Supervisor: Dr Manreena Kaur & Dr Bernadette Fitzgibbon

Project title: Adapting Neuro-cardiac-guided Repetitive Transcranial Magnetic Stimulation for Low Frequency Treatment for Depression.



### Aleksandra Miljevic

PhD Candidate, **ECIMH – Interventional Psychiatry**

Supervisors: Prof. Paul Fitzgerald, Dr Neil Bailey & Dr Sally Herring

Project title: Associations between individual differences, rTMS-induced brain changes and relapse in depression.



### Oscar Murphy

DPsych, **ECIMH – Interventional Neuropsychology**

Supervisor: Assoc. Prof. Kate Hoy

Project title: Behavioural and neurophysiological effects of transcranial electrical stimulation (tES) in healthy and depressed individuals: A TMS-EEG study.



### Sin Ki Ng

PhD Candidate, **ECIMH – Pain, Addiction and Mental Health**

Supervisors: Dr Bernadette Fitzgibbon & Prof. Paul Fitzgerald

Project title: Investigating EEG correlates of attention in ADHD, healthy controls, and meditators.



## Prabhavi Perera

PhD Candidate, **ECIMH – Interventional Psychiatry**

Supervisor: Prof. Paul Fitzgerald, Dr Neil Bailey & Dr Sally Herring

Project title: Therapeutic use of transcranial Alternating Current Stimulation (tACS) for Obsessive-Compulsive Disorder (OCD)



## Jacqui Riddiford

PhD Candidate, **MAPrc, Hormones & Cognition Group**

Supervisors: Prof. Jayashri Kulkarni, Dr Caroline Gurvich & Prof Peter Enticott

Project title: Autism, Visual Processing and the mirror neuron system.



## Dr Sarah Rotstein

PhD Candidate, **MAPrc – Body Image Research Group**

Supervisors: Prof. Jayashri Kulkarni & Dr Gemma Sharp

Project title: Medical students' stigma against psychiatry



## Bradley Stolz-Grobusch

PhD Candidate, **MAPrc, Women's Mental Health**

Supervisors: Dr Caroline Gurvich, Dr Gemma Sharp & Prof. Jayashri Kulkarni

Project title: Trauma subtypes in Borderline Personality Disorder and the impact of cognitive dysregulation on emotion regulation and treatment response during Dialectical Behaviour Therapy: The effect of cognitive bias modification.



## Scott Tagliaferri (Deakin University)

PhD Candidate, **ECIMH – Pain, Addiction and Mental Health**

Supervisor: Dr Bernadette Fitzgibbon

Project title: Identifying factors associated with the onset and persistence of low back pain



## Ms Elizabeth Thomas

PhD Candidate, **MAPrc, Hormones & Cognition Group**

Supervisor: Dr Caroline Gurvich

Project title: The influence of the glutamatergic system on cognition across the schizotypy/schizophrenia continuum – PhD submitted 2019.



## Michael Wang

PhD Candidate, **ECIMH – Pain, Addiction and Mental Health/Mindfulness, Neuroscience and Mental Health**

Supervisor: Dr Bernadette Fitzgibbon & Dr Neil Bailey

Project title: Mindfulness and Pain – Mechanisms, Limitations and Innovative tools to enhance mindfulness practice amongst chronic pain populations



# HONOURS STUDENTS

## Isabella Cavalieri

BMedSci (Hons), **MAPrc – Women's Mental Health**

Supervisors: Prof. Jayashri Kulkarni

Project title: Management of Aggression in the Emergency Department.



## Nileshni Fernando

BBiomed Sc (Hons), **MAPrc – Body Image Research Group**

Supervisors: Dr Gemma Sharp & Prof. Jayashri Kulkarni

Project title: Genital Self Image in Adolescents – Can an educational intervention impact genital body image among adolescents?



## Taran Giddey

BMedSci (Hons), **MAPrc – Cognitive Neuroscience**

Supervisors: Prof. Jayashri Kulkarni, Dr Caroline Gurvich & Dr Natalie Thomas

Project title: Peak Saccadic Eye Velocity across the Menstrual Cycle.



## Paige Gray

BSci (Hons), **MAPrc – Cognitive Neuroscience**

Supervisors: Prof. Jayashri Kulkarni, Dr Caroline Gurvich & Dr Natalie Thomas

Project title: Emotion regulation and recognition across the menstrual cycle.



## Amy Hatton

BMedSci (Hons), **MAPrc – Women's Mental Health**

Supervisor: Prof. Jayashri Kulkarni

Project title: Long term outcomes of antipsychotic medication in utero.

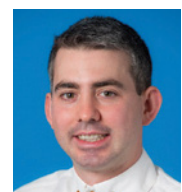


## Gregory Humble

Honours, **ECIMH – Mindfulness, Neuroscience and Mental Health**

Supervisor: Prof. Paul Fitzgerald & Dr Neil Bailey

Project title: Does regular mindfulness meditation alter neural inhibition/excitation balance? A TMS-EEG investigation.

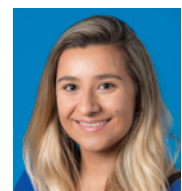


## Georgia Koutsaplis

Honours, **ECIMH – Interventional Neuropsychology**

Supervisors: Associate Prof. Kate Hoy & Dr Melanie Emonson

Project title: Investigate whether the effects of tDCS on cognition are driven by generalised improvements in information processing.



## Sharmini Kunjan

Honours, **ECIMH – Pain, Addiction and Mental Health**

Supervisor: Dr Bernadette Fitzgibbon & Dr Manreena Kaur

Project title: Investigating neuro-cardiac-guided rTMS for the treatment of depression





## Jessica Le

BMedSci (Hons), **MAPrc – Women's Mental Health**

Supervisors: Prof. Jayashri Kulkarni, Dr Caroline Gurchich & Dr Natalie Thomas

Project title: Cognitive Function Across the Menstrual Cycle in Premenstrual Dysphoric Disorder.



## Marisha Shetty

BMedSci (Hons), **MAPrc – Women's Mental Health**

Supervisors: Dr Natalie Thomas, Dr Caroline Gurchich & Dr Gemma Sharp

Project title: Stress and the battle of the sexes: Can the Perceived Stress Scale measure differences in stress responses between genders?



## MONASH ALFRED PSYCHIATRY RESEARCH CENTRE (MAPrc)

**FINANCIAL STATEMENT****January 1st – December 31st 2016–2019****INCOME**

Category	2016	2017	2018	2019
Higher Degree Supervision & Teaching	\$563,966	\$963,976	\$1,068,223	\$954,775
Competitive Research Grant Funding	\$982,437	\$1,017,461	\$1,210,288	\$1,291,755
Commercial Research Funding	\$743,428	\$1,392,272	\$1,003,274	\$948,590
Government/Institutional Grants	\$1,866,653	\$2,088,373	\$2,583,767	\$1,949,477
Short Courses/Conferences	\$312,759	\$141,640	\$158,540	\$118,882
MAPrc Clinics Revenue	\$62,760	\$48,622	\$76,413	\$75,346
Fund Raising & Donations	\$71,623	\$234,605	\$116,165	\$288,745
Partnerships	\$181,460	\$71,950	\$87,611	\$60,461
<b>TOTAL</b>	<b>\$5,958,900</b>	<b>\$6,304,281</b>	<b>\$6,304,281</b>	<b>\$5,688,030</b>

**EXPENDITURE**

Salary Related Costs	\$3,509,676	\$3,966,418	\$4,410,729	\$3,489,349
Infrastructure/Administration	\$588,471	\$572,467	\$654,363	\$438,725
Direct Research Costs	\$446,223	\$140,769	\$93,406	\$210,131
Depreciation	\$14,263	\$14,254	\$12,283	\$0
Institutional Overheads & Charges	\$932,604	\$1,413,208	\$1,302,563	\$1,000,578
<b>TOTAL</b>	<b>\$5,561,037</b>	<b>\$6,107,116</b>	<b>\$6,473,343</b>	<b>\$5,138,782</b>

<b>NET SURPLUS/(DEFICIT)</b>	<b>(\$686,543)</b>	<b>(\$148,216)</b>	<b>(\$169,062)</b>	<b>\$549,247</b>
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Notes:

1. Competitive research grant funding includes NH&MRC, ARC and other Category 1 competitive grants awarded to researchers based on competitive application schemes.
2. Commercial income includes industry related research contracts and revenue from clinical trials conducted on behalf of pharmaceutical and other research companies.
3. Government/Institutional grants include i) tenders and other competitive research schemes, ii) Victorian Department of Health funding for academic positions at Alfred Health and other operating/infrastructure funding, as well as iii) Monash University dispersed federal government funding generated on the basis of a) category one competitive research dollars b) HDR student supervision and c) MBBS undergraduate teaching activities.
4. Institutional Overheads and Charges refers to Monash University central, faculty and school charges for central operating costs including School and Faculty staff/Initiatives, Central University services including HR, IT, Research Office, Legal services, public relations, donor services.

## Financial Report Summary

MAPrc is a joint Centre of Monash University and Alfred Health. As a result, MAPrc finances are split across both Alfred Health and Monash University finance systems.

In 2019, A portion of MAPrc relocated to Epworth Camberwell. The report above is an integrated Alfred Health – Monash University report of MAPrc financial activity for the period 2016 – 2019 calendar years reported in broad categories of income and expenditure. In 2019 expenses paid from Monash University to Epworth Camberwell for operations of the ECIMH were included in this report, however all other Epworth related income and expenditure were unavailable and therefore excluded from this report.

This summary relates to financial activity in 2019. Overall MAPrc recorded income greater than expenditure. Both total revenue and total expenditure decreased in the period, however expenditure decreased more substantially, driven mainly by decreased salary expenditure. The shift of some staff to Epworth Camberwell in 2019 meant that salaries paid to those staff by Epworth are not reflected in this report. In addition, the conclusion of some grants in 2018, meant that staff requirements in 2019 were reduced. Competitive research funding received was consistent with previous years, however government/institutional income was decreased. Fund raising and donations were higher thanks to a generous donation from the Mohr Family to support a trial of a potential new treatment for schizophrenia.

Overall, MAPrc performed well financially in 2019 and carries forward a balance of funding which ensures ongoing viability and financial stability.

### 2019 Highlights

#### Competitive Research Grant Funding

In 2019 competitive research grant revenue was consistent with previous years. Competitive research grants are comprised predominantly of project grants and Fellowships from NH&MRC and ARC. Funding received from this category in 2019 related to several ongoing grants and a number of new grants as well. Competitive research grants are extremely challenging to attain but play a critical role in generating funding for research projects as well as for generating infrastructure funding to cover the indirect costs of conducting research. For every dollar of competitive research funding obtained, the University receives a proportionate amount of infrastructure funding from the Federal Government. A proportion of this infrastructure funding is passed on to the centre to cover central overhead and operating costs. Monash University also supports research in a similar manner with a Faculty based internal infrastructure scheme.

#### Commercial Research Funding

Commercial revenue represents funding received from companies including pharmaceutical or therapeutic device manufacturing companies. At the end of 2019 the Aged Clinical Trials team based at Caulfield Hospital (mainly conducting trials in dementia) was wound up due to the departure of key staff and challenges in covering operating costs. Offsetting this development, in 2019 MAPrc recommenced industry sponsored trials taking on two sponsored trials; one in major depression and one in women with chronic urinary tract infections.

#### Government/Institutional Grants Vs Institutional Overheads & Charges

Grants awarded to MAPrc by Federal and State Government for research and other activities are captured under this category, as well as indirect government funding generated from the hospital and university operating budgets. Alfred Health provides rent and facilities support for the MAPrc premises at St Kilda Road. This makes up a portion of the Government/Institutional Grants revenue reported. Monash University receives infrastructure funding from the federal government based on research grant performance, higher degree supervision and teaching activities. The University pass on in full the infrastructure MAPrc generates through these activities to support operational costs. The University then applies levies at central, faculty and school level to cover institutional and overhead costs. These levies are reported under the category of institutional Overheads.

#### Short Courses/Conference

In 2019 MAPrc ran a one-day short course on the use of transcranial magnetic stimulation (TMS) for treating depression, a one-day conference in women's mental health entitled *In Her Shoes*, and also commenced the development of a new online short course in women's mental health, aimed at GP's and other health professionals who treat women with mental ill health.

#### Partnerships

Partnerships revenue in 2019 relates primarily to a project being conducted in collaboration with Alfred Health Department of Anaesthesia trialling the use of nitrous oxide to treat people with depression.





## Fundraising and Donations

We are grateful to the Monash University Donor Relations, Alfred Health Foundation and the Epworth Foundation for providing support, direction and platforms for our donors and donations. We are not especially dynamic or overly proactive in seeking donations to support the research conducted within the Department and our research centres, and in that context we are ever more grateful to those individuals who did reach out to support us with donations in 2019. We received a total of \$237,145 via Monash University and Alfred Health and further donations not included in our financial statements were received through the Epworth Foundation to support the ECIMH.

In particular Professor Kate Hoy, based at Epworth Health was successful in attracting significant donor support:

*In 2019 A/Prof Hoy received over \$500,000 in philanthropic donations to support her research program, including from the Donald Ratcliffe and Phyllis Macleod Trust Fund, the Epworth Medical Foundation and Monash University Alumni. These generous donors have helped support the conduct of her world-first clinical trials of brain stimulation for the treatment of dementia.*

### The Mohr Family and The Damian Project

The Mohr family who tragically lost Damian Mohr to suicide met with our research team at MAPrc in mid-2019 and pledged to support research into new treatments for schizophrenia. Schizophrenia treatment took a leap forward with the advent of neuroleptic medications in the 1950's and then again with the newer 'atypical' antipsychotic medications in the 1980's and 1990's. While new agents have been released since, the incremental increase in effectiveness of treatments has not been as great as is needed to reduce the suffering and unfulfilled potential of many people living with the illness. MAPrc's Professor Jayashri Kulkarni has pioneered the use of neuroendocrine system adjunctive agents to obtain greater improvement in symptoms control, cognitive performance and overall functioning in schizophrenia, and with the support of the Mohr family in 2019 we embarked on a trial of Selective Estrogen Receptor Modulator (SERM) – Bazedoxifene to treat men with schizophrenia. The trial will run with the Mohr family support over a 4 to 5 year period.



*'Damian enriched all our lives and we hope that by virtue of this research in Damian's memory others lives will be enriched in the future'*

*The Mohr Family*

### Anthony Caruana, Nostra Homes, Villawood Homes, and the UDIA

Anthony Caruana, who is managing director of Nostra Homes, is a long-time friend and supporter of MAPrc and in 2019 Anthony was the driving force behind two major fundraising drives. The first was linked to a Villawood Homes development – The Rathdowne Townhome release, in which \$2,000 was donated to MAPrc for every townhouse sold, raising a total of \$8,000. In addition Anthony linked MAPrc with a fundraising event hosted by the UDIA as part of a mental health awareness campaign within the building industry. The event was held at Zinc, Federation Square and featured a keynote presentation by Beyond Blue founder Jeff Kennett. With over 400 people in attendance the event was a great success and the UDIA donated \$5,500 from the day to MAPrc. We are privileged and grateful to have champions of mental health like Anthony in our corner and it is this type of support that inspires us to work hard every day.



**RAISING MUCH NEEDED FUNDS**

One in five Australians (approximately 4 million people) are affected by various forms of mental illness every year. Together, Villawood Properties and Nostra are proud to support the incredible research team at Monash Alfred Psychiatry centre, by donating **\$2,000** from each townhouse sold, in the upcoming Rathdowne townhome release.

MAPrc is the Monash Alfred Psychiatry research centre and they carry out world-class research to help make a difference to the lives of people suffering from serious mental illnesses. The MAPrc mission is to develop **new treatments, new understanding and new services for mental illnesses**. The money raised will be used to further fund studies into medical treatments.

 **NOSTRA**

As well as these significant contributors to our cause, we are also grateful to the individuals who donated smaller but equally as significant amounts to support our research and mission. We are proud to affirm that every single dollar donated to MAPrc goes directly to supporting the research and projects being conducted.

# 2019 SELECTED PUBLICATIONS

## Articles

Ahmadizadeh, MJ, Rezaei, M & Fitzgerald, PB 2019, 'Transcranial direct current stimulation (tDCS) for post-traumatic stress disorder (PTSD): A randomized, double-blinded, controlled trial', *Brain Research Bulletin*, vol. 153, pp. 273-278. <https://doi.org/10.1016/j.brainresbull.2019.09.011>

Allebone, J, Kanaan, R, Maller, J, O'Brien, T, Mullen, SA, Cook, M, Adams, SJ, Vogrin, S, Vaughan, DN, Connelly, A, Kwan, P, Berkovic, SF, D'Souza, WJ, Jackson, G, Velakoulis, D & Wilson, SJ 2019, 'Bilateral volume reduction in posterior hippocampus in psychosis of epilepsy', *Journal of Neurology, Neurosurgery and Psychiatry*, vol. 90, no. 6, pp. 688-694. <https://doi.org/10.1136/jnnp-2018-319396>

Ancelin, M-L, Carriere, I, Artero, S, Maller, J, Meslin, C, Ritchie, K, Ryan, J & Chaudieu, I 2019, 'Lifetime major depression and grey-matter volume', *Journal of Psychiatry & Neuroscience*, vol. 44, no. 1, pp. 45-53. <https://doi.org/10.1503/jpn.180026>

Bailey, NW, Opie, JL, Hassed, CS & Chambers, RH 2019, 'Meditation practice, dispositional mindfulness, personality and program outcomes in mindfulness training for medical students', *Focus on Health Professional Education*, vol. 20, no. 1, pp. 50-68.

Bailey, NW, Raj, K, Freedman, G, Fitzgibbon, B, Rogasch, NC, Van Dam, NT & Fitzgerald, PB 2019, 'Mindfulness Meditators Do Not Show Differences in Electrophysiological Measures of Error Processing', *Mindfulness*, vol. 10, no. 7, pp. 1360-1380. <https://doi.org/10.1007/s12671-019-1096-3>

Bonnar, D, Castine, BR, Kakoschke, N & Sharp, G 2019, 'Sleep and performance in Eathletes: for the win!', *Sleep Health*, vol. 5, no. 6, pp. 647-650. <https://doi.org/10.1016/j.sleh.2019.06.007>

Burgess, JD, Major, BP, McNeel, C, Clark, GM, Lum, JAG & Enticott, PG 2019, 'Learning to expect: Predicting sounds during movement is related to sensorimotor association during listening', *Frontiers in Human Neuroscience*, vol. 13, 215. <https://doi.org/10.3389/fnhum.2019.00215>

Cardoso, BR, Roberts, BR, Malpas, CB, Vivash, L, Genc, S, Saling, MM, Desmond, P, Steward, C, Hicks, RJ, Callahan, J, Brodtmann, A, Collins, S, Macfarlane, S, Corcoran, NM, Hovens, CM, Velakoulis, D, O'Brien, TJ, Hare, DJ & Bush, AI 2019, 'Supranutritional Sodium Selenate Supplementation Delivers Selenium to the Central Nervous System: Results from a Randomized Controlled Pilot Trial in Alzheimer's Disease', *Neurotherapeutics*, vol. 16, no. 1, pp. 192-202. <https://doi.org/10.1007/s13311-018-0662-z>

Carruthers, SP, Cropley, V, Bousman, C, Everall, IP, Neill, E, Pantelis, C, Sumner, PJ, Australian Schizophrenia Research Bank, Tan, EJ, Bozaoglu, K, Thomas, EHX, Van Rheenen, TE, Gurvich, CT & Rossell, SL 2019, 'The effects of a muscarinic receptor 1 gene variant on executive and non-executive cognition in schizophrenia spectrum disorders', *Psychiatry Research*, vol. 273, pp. 178-180. <https://doi.org/10.1016/j.psychres.2019.01.032>

Carruthers, SP, Gurvich, CT, Meyer, D, Bousman, C, Everall, IP, Neill, E, Pantelis, C, Sumner, PJ, Tan, EJ, Thomas, EHX, Van Rheenen, TE & Rossell, SL 2019, 'Exploring Heterogeneity on the Wisconsin Card Sorting Test in Schizophrenia Spectrum Disorders: A Cluster Analytical Investigation', *Journal of the International Neuropsychological Society*, vol. 25, no. 7, pp. 750-760. <https://doi.org/10.1017/S1355617719000420>

Cash, RFH, Cocchi, L, Anderson, R, Rogachov, A, Kucyi, A, Barnett, AJ, Zalesky, A & Fitzgerald, PB 2019, 'A multivariate neuroimaging biomarker of individual outcome to transcranial magnetic stimulation in depression', *Human Brain Mapping*, vol. 40, no. 16, pp. 4618-4629. <https://doi.org/10.1002/hbm.24725>

## 2019 Selected Publications (continued)

Che, X, Cash, R, Chung, SW, Bailey, N, Fitzgerald, PB & Fitzgibbon, BM 2019, 'The dorsomedial prefrontal cortex as a flexible hub mediating behavioral as well as local and distributed neural effects of social support context on pain: A Theta Burst Stimulation and TMS-EEG study', *NeuroImage*, vol. 201, 116053. <https://doi.org/10.1016/j.neuroimage.2019.116053>

Chen, L, Hudaib, AR, Hoy, K & Fitzgerald, PB 2019, 'Is rTMS effective for anxiety symptoms in major depressive disorder? An efficacy analysis comparing left-sided high-frequency, right-sided low-frequency, and sequential bilateral rTMS protocols', *Depression and Anxiety*, vol. 36, no. 8, pp. 723-731. <https://doi.org/10.1002/da.22894>

Chung, SW, Sullivan, CM, Rogasch, NC, Hoy, KE, Bailey, NW, Cash, RFH & Fitzgerald, PB 2019, 'The effects of individualised intermittent theta burst stimulation in the prefrontal cortex: A TMS-EEG study', *Human Brain Mapping*, vol. 40, no. 2, pp. 608-627. <https://doi.org/10.1002/hbm.24398>

Chung, SW, Thomson, CJ, Lee, S, Worsley, RN, Rogasch, NC, Kulkarni, J, Thomson, RH, Fitzgerald, PB & Segrave, RA 2019, 'The influence of endogenous estrogen on high-frequency prefrontal transcranial magnetic stimulation', *Brain Stimulation*, vol. 12, no. 5, pp. 1271-1279. <https://doi.org/10.1016/j.brs.2019.05.007>

Emonson, MRL, Fitzgerald, PB, Rogasch, NC & Hoy, KE 2019, 'Neurobiological effects of transcranial direct current stimulation in younger adults, older adults and mild cognitive impairment', *Neuropsychologia*, vol. 125, pp. 51-61. <https://doi.org/10.1016/j.neuropsychologia.2019.01.003>

Fehring, DJ, Illipparampil, R, Acevedo, N, Jaberzadeh, S, Fitzgerald, PB & Mansouri, FA 2019, 'Interaction of task-related learning and transcranial direct current stimulation of the prefrontal cortex in modulating executive functions.', *Neuropsychologia*, vol. 131, pp. 148-159. <https://doi.org/10.1016/j.neuropsychologia.2019.05.011>

Fitzgerald, PB 2019, 'Is Maintenance Repetitive Transcranial Magnetic Stimulation for Patients With Depression a Valid Therapeutic Strategy?', *Clinical Pharmacology & Therapeutics*, vol. 106, no. 4, pp. 723-725. <https://doi.org/10.1002/cpt.1566>

Fitzgibbon, BM & Schabrun, SM 2019, 'Transcranial Direct Current Stimulation for Pain Disorders: Challenges and New Frontiers', *Clinical Pharmacology & Therapeutics*, vol. 106, no. 4, pp. 717-719. <https://doi.org/10.1002/cpt.1544>

Gurvich, C, Hudaib, A, Gavrilidis, E, Worsley, R, Thomas, N & Kulkarni, J 2019, 'Raloxifene as a treatment for cognition in women with schizophrenia: the influence of menopause status', *Psychoneuroendocrinology*, vol. 100, pp. 113-119. <https://doi.org/10.1016/j.psyneuen.2018.10.001>

Hadas, I, Sun, Y, Lioumis, P, Zomorodi, R, Jones, B, Voineskos, D, Downar, J, Fitzgerald, PB, Blumberger, DM & Daskalakis, ZJ 2019, 'Association of Repetitive Transcranial Magnetic Stimulation Treatment With Subgenual Cingulate Hyperactivity in Patients With Major Depressive Disorder: A Secondary Analysis of a Randomized Clinical Trial', *JAMA Network Open*, vol. 2, no. 6, e195578. <https://doi.org/10.1001/jamanetworkopen.2019.5578>

Hill, AT, Rogasch, NC, Fitzgerald, PB & Hoy, KE 2019, 'Impact of concurrent task performance on transcranial direct current stimulation (tDCS)-Induced changes in cortical physiology and working memory', *Cortex*, vol. 113, pp. 37-57. <https://doi.org/10.1016/j.cortex.2018.11.022>

Hoy, KE, McQueen, S, Elliot, D, Herring, SE, Maller, JJ & Fitzgerald, PB 2019, 'A Pilot Investigation of Repetitive Transcranial Magnetic Stimulation for Post-Traumatic Brain Injury Depression: Safety, Tolerability, and Efficacy', *Journal of Neurotrauma*, vol. 36, no. 13, pp. 2092-2098. <https://doi.org/10.1089/neu.2018.6097>



Kaur, M, Chitty, KM, Lagopoulos, J, Hickie, IB, Duffy, SL & Hermens, DF 2019, 'Elucidating the glutamatergic processes underlying mismatch negativity deficits in early stage bipolar disorder and schizophrenia: A combined H-MRS and EEG study', *Journal of Psychiatric Research*, vol. 113, pp. 83-89. <https://doi.org/10.1016/j.jpsychires.2019.03.018>

Kaur, M, Michael, JA, Fitzgibbon, B, Hoy, KE & Fitzgerald, PB 2019, 'Low-frequency rTMS is better tolerated than high-frequency rTMS in healthy people: Empirical evidence from a single session study', *Journal of Psychiatric Research*, vol. 113, pp. 79-82. <https://doi.org/10.1016/j.jpsychires.2019.03.015>

Kaur, M, Naismith, SL, Lagopoulos, J, Hermens, DF, Lee, RSC, Carpenter, JS, Fitzgerald, PB, Hoy, KE, Scott, EM & Hickie, IB 2019, 'Sleep-wake, cognitive and clinical correlates of treatment outcome with repetitive transcranial magnetic stimulation for young adults with depression', *Psychiatry Research*, vol. 271, pp. 335-342. <https://doi.org/10.1016/j.psychres.2018.12.002>

Lee, SJ, Lawrence, R, Bryce, S, Ponsford, J, Tan, EJ & Rossell, SL 2019, 'Emotional discomfort mediates the relationship between self-efficacy and subjective quality of life in people with schizophrenia', *Journal of Mental Health*. <https://doi.org/10.1080/09638237.2019.1581355>

Lithgow, BJ, Moussavi, Z & Fitzgerald, PB 2019, 'Quantitative separation of the depressive phase of bipolar disorder and major depressive disorder using electrovestibulography', *World Journal of Biological Psychiatry*, vol. 20, no. 10, pp. 799-812. <https://doi.org/10.1080/15622975.2019.1599143>

Maller, JJ, Welton, T, Middione, M, Callaghan, FM, Rosenfeld, JV & Grieve, SM 2019, 'Revealing the Hippocampal Connectome through Super-Resolution 1150-Direction Diffusion MRI', *Scientific Reports*, vol. 9, no. 1, 2418. <https://doi.org/10.1038/s41598-018-37905-9>

Murphy, OW, Hoy, K, Wong, D, Bailey, N, Fitzgerald, PB & Segrave, R 2019, 'Individuals with depression display abnormal modulation of neural oscillatory activity during working memory encoding and maintenance', *Biological Psychology*, vol. 148, 107766. <https://doi.org/10.1016/j.biopsycho.2019.107766>

Phillipou, A, Kirkovski, M, Castle, DJ, Gurvich, C, Abel, LA, Miles, S & Rossell, SL 2019, 'High-definition transcranial direct current stimulation in anorexia nervosa: A pilot study', *International Journal of Eating Disorders*, vol. 52, no. 11, pp. 1274-1280. <https://doi.org/10.1002/eat.23146>

Pirotta, S, Barillaro, M, Brennan, L, Grassi, A, Jeanes, YM, Joham, AE, Kulkarni, J, Monahan Couch, L, Lim, S & Moran, L 2019, 'Disordered eating behaviours and eating disorders in women in australia with and without polycystic ovary syndrome: A cross-sectional study', *Journal of Clinical Medicine*, vol. 8, no. 10, 1682. <https://doi.org/10.3390/jcm8101682>

Rotstein, S, Hudaib, AR, Facey, A & Kulkarni, J 2019, 'Psychiatrist burnout: a meta-analysis of Maslach Burnout Inventory means', *Australasian Psychiatry*, vol. 27, no. 3, pp. 249-254. <https://doi.org/10.1177/1039856219833800>

Sharp, G & Oates, J 2019, 'Sociocultural Influences on Men's Penis Size Perceptions and Decisions to Undergo Penile Augmentation: A Qualitative Study', *Aesthetic Surgery Journal*, vol. 39, no. 11, pp. 1253-1259. <https://doi.org/10.1093/asj/sjz154>

Sharp, G & Oates, J 2019, 'Nonsurgical Medical Penile Girth Augmentation: A Retrospective Study of Psychological and Psychosexual Outcomes', *Aesthetic Surgery Journal*, vol. 39, no. 3, pp. 306-316. <https://doi.org/10.1093/asj/sjy108>

## 2019 Selected Publications (continued)

Thomas, EHX, Rossell, SL, Myles, JB, Tan, EJ, Neill, E, Carruthers, SP, Sumner, PJ, Bozaoglu, K & Gurvich, C 2019, 'Working Memory and Attention Influence Antisaccade Error Rate in Schizophrenia', *Journal of the International Neuropsychological Society*, vol. 25, no. 2, pp. 174-183. <https://doi.org/10.1017/S1355617718001066>

Thomas, EHX, Rossell, SL, Tan, EJ, Neill, E, Van Rheenen, TE, Carruthers, SP, Sumner, PJ, Louise, S, Bozaoglu, K & Gurvich, C 2019, 'Do schizotypy dimensions reflect the symptoms of schizophrenia?', *Australian & New Zealand Journal of Psychiatry*, vol. 53, no. 3, pp. 236-247. <https://doi.org/10.1177/0004867418769746>

Thomas, N, Gurvich, C, Hudaib, AR, Gavrilidis, E & Kulkarni, J 2019, 'Dissecting the syndrome of schizophrenia: Associations between symptomatology and hormone levels in women with schizophrenia', *Psychiatry Research*, vol. 280, 112510. <https://doi.org/10.1016/j.psychres.2019.112510>

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### Review Articles

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