Contents

The IMPACT SRC team

Forewords

2014 has been another productive year for the IMPACT SRC. SRC members and students have continued to have success with both internal and external awards and grants and national and international recognition.

I congratulate the team for their excellence in research driven by innovative techniques and thinking and wish them every success in 2015.

Professor Lee Astheimer
Deputy Vice Chancellor, Research
Deakin University

The last year has been characterised by significant levels of research activity of the highest calibre. The research covers many domains and leaves you with an optimistic view of improved mental health outcomes. Barwon Health is focussed on being a world class health service and the research of Professor Michael Berk and his team is clearly taking a leadership role in that aspiration.

Professor David Ashbridge
Chief Executive Officer
Barwon Health

Introduction by Professor Michael Berk

Professor Michael Berk

2014 was another productive year for the IMPACT Strategic Research Centre. The quality and quantity of our research output continues to grow with 145 (plus potentially more to be added) publications in 2014 including a number of high impact publications in the top journals in the field, including Molecular Psychiatry, Lancet Psychiatry, The American Journal of Psychiatry and The British Journal of Psychiatry.

A number of members of the team had particular successes. SRC members were fortunate to have been partners on two NHMRC project grants, a Stanley Foundation grant and a Centre for Research Excellence grant. Dr Sharon Brennan was awarded an Alfred Deakin Scholarship and the Vice-Chancellor's Early Career Research Award for Research Excellence. Dr Singh was awarded a Doctor of Medicine in December 2013 for his work and won a travel award to present findings at the World Congress of Psychiatric Genetics in Boston. He was also awarded best scientific poster at the Smart Geelong Research and Innovation Expo in November 2013 for the same work. Felice Jacka was successful in receiving the Lundbeck Institute Award from the Australasian Society for Psychiatric Research at the end of 2013. Lana Williams took up a prestigious NHMRC Career Development fellowship.

2014 was also a particularly good year for IMPACT students. Shae Quirk won best student presentation and received a Grant in Aid at the Society for Mental Health Research annual conference. Natalie Hyde won an Australian Postgraduate Award and the Audience choice award at this year's Geelong Research week, and was nominated for the early career for researcher of the year as well as being nominated for a poster prize at the Australian and New Zealand Bone and Mineral Society conference. Steve Moylan won the HMO Best Research Project Award for Barwon Health as part of the Barwon Health Research Week in Nov 2013. Emma Gliddon was awarded a PhD scholarship from the Ian Parker Bipolar Research Fund and Australian Rotary Health.

The SRC continues to develop strong collaborative links with health service providers including: Barwon Health; research centres within Deakin including PRADA, Centre for Molecular and Medical Research, Centre for Mental Health and Wellbeing, Centre for Science, Engineering and Built Environment and Deakin Population Health; and multiple international partners in countries including the US, Brazil, Denmark, Portugal, Canada, Thailand, Spain and China. We would like to thank Deakin University and Barwon Health for their continuing support.

The Epi-Centre for Healthy Ageing, led by Professor Julie Pasco

Professor Julie Pasco

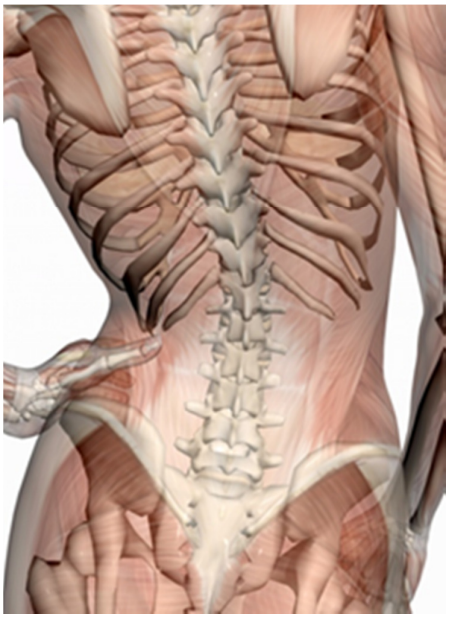
Professor Julie Pasco is Deputy Director of the IMPACT SRC and Director of the Epi-Centre for Healthy Ageing.

Our population-based research focuses on understanding the progression of chronic metabolic and musculoskeletal disorders including obesity, osteoporosis and sarcopenia, and the nexus between physical and mental health. An important component of this program of epidemiological research is to facilitate knowledge transfer from research into clinical practice and into the community.

At the heart of the Epi-Centre for Healthy Ageing lies the Geelong Osteoporosis Study (GOS) which is complemented by the GOS Fracture Grid and the Vitamin D in Pregnancy (VIP) study.

The GOS is a prospective cohort study, which was designed to describe the health burden of osteoporosis and identify risk factors for fragility fracture, and has evolved over time to study a broad range of chronic disorders. The study is set in the Barwon Statistical Division. For more than two decades the GOS has prospectively documented comprehensive clinical and environmental data for large contemporary cohorts of young, middle-aged and elderly men and women, producing a unique dataset for investigating aspects of both physical and mental health.

The GOS Fracture Grid is an ongoing, comprehensive repository that documents incident fractures as they occur in the Barwon Statistical Division. For twenty years this unique dataset has been recording fracture case details according to fracture site, age, sex and date. Data from the GOS Fracture Grid provides a unique evidence base for describing the epidemiology of fractures and for monitoring changes in patterns of fracture for an entire population.



The VIP study started in 2002 when pregnant women were recruited from Geelong Hospital's antenatal clinic and provided blood samples for vitamin D assessment. Their babies were measured at birth and at age one. The mother-child pairs are now being recalled to see if maternal vitamin D status during pregnancy impacts on muscle and bone growth, fat distribution and behaviour in the children as they reach upper primary school age.

Nested within the Epi-Centre are the units of Social Epidemiology (led by Dr Sharon Brennan) and Psychiatric Epidemiology (led by Dr Lana Williams).

Bipolar disorder research

Depression and bipolar disorder research are a focus within the IMPACT Strategic Research Centre.

We are attempting to answer the question of which potential mood stabilising agents have the best neuroprotective properties after a first-episode of mania. In the study, individuals who have had a first-episode of mania were randomised to receive either lithium or quetiapine and they were followed up for a year using brain imaging and neuropsychology to determine which agent best protects the brain. The study is complete and analysis is underway.

A further focus is on carer-burden in bipolar disorder and depression. A Delphi study to develop guidelines for carers of people with bipolar disorder, and a treatment intervention based on the results of the study has been developed. This platform is being extended to carers of people with depression. In conjunction with the Geelong Osteoporosis Study, we are currently recruiting for the Bipolar Health and Lifestyle Study. Participants with bipolar disorder from the community will be studied to understand associated health and lifestyle factors and underlying mechanisms in the disorder. Findings may be used to inform public policy and health service delivery, leading to improved treatment and health outcomes for people with bipolar disorder.

Our oxidative biology program has a major focus on bipolar disorder. Having shown that N-acetylcysteine (NAC) effectively treats the symptoms of depression in bipolar disorder, we have just completed a study showing that it reduces depression in unipolar disorder as well. As part of this suite of clinical trials, we are also examining biomarkers including measures of inflammation and oxidative stress as well as neuroimaging in conjunction with our research partners led by Professor Gin Malhi at the University of Sydney. We have just commenced a large NHMRC and CRC funded project to definitively study the efficacy of NAC in bipolar depression, as well as a cocktail of mitochondrially active agents. The latter study is a proof of concept trial of the notion that there is a primary abnormality in mitochondrial energy generation in bipolar disorder.

Together with Dr Sue Tye from the Mayo Clinic, we are developing a novel animal model of bipolar disorder using deep brain stimulation, to examine changes in energy generation in models of both depression and mania. We are grateful for the partnership with Professor Abbas Kouzani from Science, Engineering and Built Environment who leads the development of novel DBS and optogenetic devises for preclinical study, a critical element in this program of research.

Professor Ken Walder from the MRR SRC has developed a drug discovery program for diabetes by looking at the gene expression signature of existing agents, and finding new potential treatments that target this gene expression signature. We are developing an analogous drug discovery program for bipolar disorder in partnership with Professor Walder, and were pleased to have won a NHMRC project grant to progress this work. Lastly, we had surprising success in a clinical trial of *Garcinia Mangostana Linn*. (mangosteen) in the treatment of schizophrenia, and are continuing further study into schizophrenia and aiming to extend these findings to explore its efficacy in bipolar disorder.

Drug safety

A/Prof Seetal Dodd

The large range of medications available for the treatment of mental illness have helped improve the lives of thousands, perhaps even millions of people. These agents have helped people manage their illnesses, prevented or reduced the recurrence of illness and controlled symptoms of illness. Although people with mental health difficulties have benefited greatly from modern drug treatments, these treatments are also known to have risks. Researchers at IMPACT SRC work to understand and reduce the risks and to improve the risk-to-benefit ratios for drug treatment of mental illness.

As well as our ongoing studies investigating treatment emergent adverse events, this year we have expanded our efforts to increase the benefits side of the risk/benefit equation, by looking at how our existing treatments can be used in individualised treatment plans so as to maximise their efficacy. Moreover, we have commenced work evaluating the neuroprotective properties of conventional and novel treatments. These studies may provide a new treatment objective for people with mental illness, preventing the worsening course of the illness rather than simply reacting to the symptoms of the illness. This new approach to treatment in mental health may ultimately lead to both better mental health and better drug safety outcomes. Chronic, treatment resistant stages of illness are typically associated with higher doses of treatment and drug combinations. If this can be averted through our neuroprotective strategies then drug safety will be improved. In April 2014 Associate Professor Dodd co-chaired and presented important neuroprotection research at the 4th Biennial Schizophrenia International Research Conference in Florence, Italy. We have also published several papers on oxidative, nitrosative and inflammatory stress, which is core to the topic of neuroprotection.

We have conducted research using adverse event data from clinical trials. This research has highlighted the complexity of the placebo and nocebo effect, which are important confounders when investigating adverse events. The work is currently in press with the *Journal of Clinical Psychiatry*.

We have been involved in the publication of guidelines, which assist clinicians to make well-informed and balanced treatment decisions. These include publications regarding the safe use of drugs for the evidence-based treatment of various mental illnesses as well as publications about safe treatments in special populations, such as pregnant and breast-feeding women.

Highlighting our role in this area, Associate Professor Seetal Dodd currently holds the position of Editor-in-Chief of the scientific journal Current Drug Safety.

Clinical Trials Division

Dr Olivia Dean

Novel therapies are central to improving outcomes for those with mental health disorders. Our Clinical Trials Division is currently focusing on evidence based, adjunctive pharmacotherapies to provide greater recovery for individuals with a variety of psychiatric disorders. The central program of the Division explores the repurposing of existing agents, based on their known biological profiles, to attempt to reduce the symptoms experienced by those with psychiatric disorders. In a cyclic approach, the Division incorporates biological sampling (blood samples) and preclinical investigations (with Kay Hasebe, PhD candidate, in collaboration with Laura Gray, Deakin University) to both identify relevant mechanisms of action for therapeutic targets, but also to better understand the underlying pathophysiology of the illnesses. Our current trials focus on adjunctive therapies to modulate oxidative biology, inflammation, neurogenesis and mitochondrial dysfunction; all factors that are believed to be important in the pathology of many psychiatric illnesses.

The Clinical Trials Division is currently recruiting participants interested in taking part in our trials. The current studies are focusing on people with depression, both major depression and those with bipolar disorder, currently experiencing symptoms of depression. Additionally, we have a collaborative study involving the Deakin University/Barwon Health partnership, investigating NAC as a treatment for post-operative cognitive decline (involving PhD candidate David Skvarc in collaboration with lead investigator, Dr Andrew Marriott). These multi-centre trials involve centres located in Geelong and Melbourne, Victoria, Sydney, New South Wales as well as international sites in Thailand, Brazil and Denmark.

The current trials include a new study that will extend our previous work with N-acetylcysteine (NAC). This clinical trial involves three treatment arms, a placebo arm, a NAC-alone arm and a combination arm incorporating NAC with other nutraceuticals, believed to alter mitochondrial function. There is mounting evidence to suggest that the symptoms of bipolar disorder are partially driven by changes in our energy powerhouses, the mitochondria. By adding-on nutraceuticals that target mitochondrial function, we are hoping that the symptoms of bipolar disorder may be improved. In another world-first study, we are investigating an antibiotic, minocycline, as a potential adjunctive antidepressant treatment. In addition to being antimicrobial, minocycline has anti-inflammatory properties that may be beneficial for the symptoms of depression. The study is currently nearing its first phase of completion. In a study with similar biological relevance, we are also currently investigating the potential of two other anti-inflammatory agents to treat youth depression; rosuvastatin and aspirin. Similar to the minocycline trial, these agents have properties that may be useful in treating youth depression. The benefit of utilising existing agents is that they have known safety profiles with expected side effects. More importantly, the agents are available following completion of the trials, making the IMPACT SRC trials particularly attractive to participants.

We have recently completed two trials investigating adjunctive NAC treatment. Results of our trial investigating NAC for depression have recently been published in the Journal of Clinical Psychiatry. We are currently analysing the results from our recently completed trial for children with autism. We hope to have results available for public dissemination soon. The Clinical Trials Division currently has a register open to anyone who has a psychiatric disorder and would be interested in taking part in our studies. If you would like more information regarding the register, please contact Dr Olivia Dean – (03) 4215 3300.

Psychiatric disorders and comorbidity

Mood, anxiety and personality disorders impose huge costs, both on the individual and the community, yet we have an incomplete understanding of their impact on lifestyle, social and in particular medical factors.

Dr Lana Williams: NHMRC Career Development Fellow and Head, Psychiatric Epidemiology.

Over the past years, Dr Williams has been developing a program of research investigating medical, lifestyle and social outcomes associated with mood, anxiety and personality disorders. This research has been conducted in conjunction with the Geelong Osteoporosis Study (GOS), a large epidemiological study involving a population-based sample of over 2000 randomly selected men and women.

This research has revealed associations between mood and anxiety disorder and a range of medical conditions including osteoporosis, irritable bowel syndrome, atopic disorders, pain and cardiovascular diseases. Associations between mood and anxiety disorders and lifestyle factors such as smoking and physical activity and social factors such as area based SES and quality of life have also been explored. A wide range of social, psychological and biological factors such as the presence of inflammation and/or oxidative stress are being investigated, which may explain these associations. Complementing this work is a case-control study of bipolar disorder, designed to identify associated lifestyle and physical co morbidities.

Cornerstone to this program is our work investigating the interplay between psychiatric disorders, the medications used to treat these disorders and bone health, which has attracted extensive project funding and personal awards. This project engages experts from the fields of psychiatry, bone biology, epidemiology and translation worldwide to provide a comprehensive understanding of this clinically important but neglected issue. To date, we have found depression to be associated with reduced bone mineral density, affect bone quality and increase the risk of fracture by 60%. We were also one of the first to show that the SSRI group of antidepressants may increase the risk for osteoporosis and that these agents, *in vitro*, have marked intra class differences in their effects on bone. The effects of psychoactive drugs on physical health is under further review in a study known as PROFRAC and these relationships are being investigated at the cellular level with collaborators in the laboratories at Barwon Biomedical Research, Deakin University and in Lyon, France. Excitingly, in collaboration with colleagues in China, a randomised controlled trial is being conducted and if successful can be expected to inform changes in safety guidelines to incorporate recommendations for prevention and treatment of poor skeletal health in psychiatric patients.

Overall this large program of work generates important information that can be used to provide an insight into the interaction between physical and mental health. It is an invaluable resource for collaborative studies and student projects. Existing collaborations include Norwegian University of Science and Technology, University of Eastern Finland, Institute of Functional Genomics of Lyon, Sapienza University of Rome, University of Manitoba and Guiyang Medical University, which allows for further investigations and replication in even larger population based studies.

Prevention of common mental disorders

A/Prof Felice Jacka

Depression and anxiety are highly prevalent conditions, and the burden they impose on individuals and the community is enormous. In our research unit we have developed a highly innovative program of research that examines how our lifestyles (diet, physical activity and smoking) interact with our risk for mental health problems. This is being done with the ultimate goal of developing an evidence-based public health message for the primary prevention of these common mental disorders.

Associate Professor Felice Jacka leads the Division of Nutritional Psychiatry Research within the IMPACT SRC. She is also president of the 'Alliance for the Prevention of Mental Disorders' (AMPD) while Professor Michael Berk and Dr Adrienne O'Neil act on the executive committee. In this role in 2014, A/Prof Jacka acted as guest editor for a special cross-journal collection of articles in BMC Medicine and BMC Psychiatry focused on the prevention of mental disorders. In addition to the editorial, this collection comprised key papers addressing the evidence for and potential of prevention initiatives in early childhood settings, the workplace and public health policy. In support of this topic, A/Prof Jacka also participated in a filmed interview at BMC Medicine and gave an invited presentation at The 8th World Congress on Promoting Mental Health in London, UK. The APMD held its first conference in December, 2014 and comprised attendees and speakers from across Australia.

A/Prof Jacka is also the president of the 'International Society for Nutritional Psychiatry Research' (ISNPR). In this role she presented a symposium at the World Psychiatric Association conference in Madrid, Spain, which was exceptionally well attended. She and members of her team also published extensively on the role of diet and nutrition in the prevention and treatment of mental disorders in 2014. These scientific papers include data on dietary patterns as predictors of depression in older Australians, a systematic review of associations between dietary patterns and poor mental health in children and adolescents and a report on associations between aspects of diet and mental health in Japanese adults.

Finally, we continue to recruit participants for a world's first trial that aims to answer the important question "If I improve my diet, will my mental health improve?" As such, we need to recruit approximately 200 adults suffering from major depression. We will then examine the impact of dietary improvement on their depressive symptoms at the end of the trial period. This trial is being conducted at St Vincent's in Melbourne until June of 2015. For further information, people can email: diet@barwonhealth.org.au or call Sarah on (03) 4215 3325. The website is: www.dietdepressionstudy.com.

Acting on the social determinants of chronic disease and healthcare utilisation

Dr Sharon Brennan

Dr Sharon Brennan, Research Fellow funded by the National Health and Medical Research Council (NHMRC of Australia), is Head of the Social Epidemiology Unit. She is also Associate Editor for BMC Musculoskeletal Disorders and holds a conjoint position as Research Fellow with the Australian Institute for Musculoskeletal Sciences.

The Social Epidemiology Unit places health equity at the forefront of Geelong-based knowledge generation and dissemination, interventions and policy discussions; information that has significant implications for a healthier Geelong. This program incorporates a large body of work to address significant gaps in current knowledge regarding social disadvantage and non-communicable, chronic diseases at different stages of pre-disease, and disease diagnosis and treatment phases, and also appropriate points and avenues for intervention, focusing on the Barwon region population, but ultimately informing Australian health policy and practice.

Future direction for this group includes a focus on: (i) the engagement of disadvantaged individuals in the promotion of preventive health messages, (ii) developing processes so as the voices of disadvantaged individuals are represented in projects aimed at reducing less healthy lifestyles, (iii) an increase in multi-level analyses that disentangle the random and fixed effects of social determinants at the individual, household, neighbourhood and policy levels on chronic diseases, (iv) a greater focus on partnership projects with social and health policy representatives, (v) a strategic focus on knowledge dissemination and implementation science, and (vi) implementation of a chronic disease prevention mechanism based on Canadian expertise.

Over the last 12 months Sharon has been awarded the Vice Chancellor's Early Career Research Award for Excellence in Ideas (2014), the Annual President's Poster Award for most outstanding abstract at the American Society for Bone and Mineral Research (2013) and a Scientists' Research Prize for most outstanding research presentation at the annual Geelong Research Network research week (2013). She was involved in attracting more than $2.2 million in project funding, holding an Alfred Deakin Post-Doctoral Research Fellowship, which she will begin in 2015.

International collaboration with Canada has continued, which has seen a successful array of publications and research findings concerning the bone health of Canadian Indigenous vs. non-Indigenous persons, post-fracture care and mortality, and the role played by social and ethnic disadvantage on fracture risk. A key finding from this collaboration has been the finding that the Canadian-specific fracture prediction tool, developed by the World Health Organisation (WHO), performs adequately across the socioeconomic continuum.

Novel and contemporary approaches to chronic disease management

Dr Adrienne O'Neil

Dr Adrienne O'Neil is a behavioural scientist and NHMRC Early Career Fellow with the IMPACT Strategic Research Centre within the School of Medicine at Deakin University. For the past 10 years, she has been developing a research program that focuses on the primary and secondary prevention of cardio-metabolic conditions - with a focus on their relationship with mental disorders - and the role of lifestyle and technology in the development of effective and contemporary interventions. Currently, the two projects she leads utilise longitudinal data from the Geelong Osteoporosis Study to (i) develop a new risk equation for predicting 10-year cardiovascular risk by incorporating depression parameters and (ii) investigate the role of diet as a source of inflammation in the onset of coronary disease. These projects have prompted collaborations between Dr O'Neil and researchers at University of California-Berkeley and University of South Carolina, respectively. Dr O'Neil is also involved in numerous collaborations in Australia including the ADVENT cohort study, a NHMRC funded project exploring the relationship between negative emotions, autonomic regulation and coronary disease, on which she is a chief investigator.

Dr O'Neil has spent much of 2014 based at the Department of Psychiatry and Behavioral Science at Stanford University, California, under the supervision of Professor Barr Taylor to further develop her research program. During her time here, she has been involved in a number of e-health studies looking at the efficacy of a mental health app, supplemented by health coaching, for the management of anxiety and eating disorders. This has involved collaboration with San Francisco-based industry called "Thrive On" which is a program development company that specializes in personalized, online programs for mental health.

Earlier this year, Dr O'Neil chaired the Barwon Health-Deakin University Grants Review Meeting attended by researchers from the local area to provide key feedback on prospective grant proposals for submission in 2015. This year also saw her appointed to Associate Editor of BMC Psychiatry. Her research highlights for this year include:

Research impact #1: As senior author on a scientific article identifying the prevalence of cardio-metabolic disorders in patients with treatment refractory schizophrenia using anti-psychotics (led by Honours student Natalie Hyde). Dr O'Neil and Associate Professor Seetal Dodd were subsequently invited by Novartis Pharmaceuticals to sit on their Advisory Committee to update guidelines around the prevention of cardio-metabolic abnormalities associated with clozapine use. Guidelines are being drafted for use by mental health clinicians and cardiologists upon completion.

Research impact #2: In 2010, Dr O'Neil led a meta-analysis quantifying the impact of depression treatment on mental and physical health functioning of coronary patients. Findings from this manuscript have now been incorporated into two (inter)national clinical guideline papers developed by Australian and Canadian authoritative bodies; the National Heart Foundation Australia's Clinical Guidelines and the Canadian Task Force on Preventive Health Care (CTFPHC) "Screening for depression".

Research impact #3: Dr O'Neil led a scientific paper that directly addressed the key gaps in the literature identified by the American Heart Association's position paper stating that it is unclear whether depression is a risk factor for incident Coronary Heart Disease. This manuscript has been submitted to the Journal of the American Medical Association (JAMA)'s special edition in Cardiovascular Disease (CVD). These findings are now being used to develop a new CVD risk assessment tool that includes depression parameters.

Genetic Prediction of Antidepressants Remission

Dr Ajeet Singh

Genetically guided prescribing (pharmacogenetics) may help sooner match patients to effective tolerable medication. An international multi-centre candidate gene association study examining the role of polymorphisms of the blood brain barrier (BBB) efflux pump P-glycoprotein (ABCB1) for remission predictive utility (n=113) was conducted. It suggested that the dose of antidepressant needed to remit from major depression correlated with patient ABCB1 genotype – a treatment biomarker with translational potential. Dr Singh was awarded a Doctor of Medicine in December 2013 for this work and won a travel award to present findings at the World Congress of Psychiatric Genetics in Boston, October 2013. He was also awarded best scientific poster at the Smart Geelong Research and Innovation Expo in November 2013 for the same work. Following on from this doctoral work Dr Singh has recruited 120 subjects as part of a two year 0.2EFT post-doctor Pfizer NSR grant funded study - expanding on his BBB pharmacogenetics work. It is anticipated that results of this study will be at hand in late 2014/early 2015. Dr Singh hopes to elucidate the pharmacogenetic keys to the BBB – with potential utility to effective prescribing of many CNS (brain) medications. Time will tell if this work yields wheat or chaff.

Determining the implications and risks of fracture in the Australian population

Dr Kara Holloway

Dr Kara Holloway, Postdoctoral Research Fellow, joined the IMPACT SRC, School of Medicine, Deakin University in July 2013. She completed a Postdoctoral qualification at The University of Adelaide in May 2013 on the history of tuberculosis, with a focus on skeletal and epidemiological methodologies. She is also an Editorial Associate for the Journal of Comparative Human Biology.

Dr Holloway is currently working on a number of projects assessing the epidemiology and risk factors associated with fracture in a representative sample of the Australian population by drawing information from the ongoing Geelong Osteoporosis Study (GOS). Her aims are to estimate the public health costs associated with morbidity and mortality of fractures during the entire life course and provide important and useful outcomes for fracture treatment and prevention.

Kara received a University Doctoral Research Medal this year for excellence in her PhD studies. She has also published twelve articles in good quality, peer-reviewed journals such as Clinical Research on Foot and Ankle, Osteoporosis International, Calcified Tissue International and BMC Obesity and her publication rate is poised to accelerate. This year, Kara's work has been presented at many conferences, both national and international including Melbourne, Taipei, USA and New Zealand.

Our PhD candidates

Sue Lauder,
PhD candidate

MOODSWINGS 2.0 ONLINE INTERVENTION

Our research team are continuing their international collaboration with Stanford University, after successfully obtaining funding from the National Institutes of Health (NIH) to further evaluate one of the first online self-help programs for bipolar disorder called MoodSwings 2.0 (www.moodswings.net.au).

The MoodSwings program is an online, self-help program. It offers adjunctive psychosocial tools and information to help manage bipolar disorder. It includes a number of core modules that cover information about bipolar disorder and strategies to assist in staying well. There are also moderated peer discussion boards, and follow up booster sessions. We have developed three different versions of MoodSwings and are comparing whether there are any differences in outcomes between a discussion only version, an information version (psychoeducation), and a more intensive Cognitive Behavioural Therapy (CBT) version. Participants in this study are randomly allocated to one of these three versions of the program after they have been screened to confirm they meet study inclusion criteria.

Recruitment for this study commenced in February 2014 and is ongoing. A total of 300 participants will be involved in the MoodSwings trial, with 150 participants allocated to the Barwon Health research site. To date, we have received almost 900 expression of interest. In December we reached 80% of our recruitment target with 250 international participants. Our participants are mostly from Australia and the United States, however we also have participants in New Zealand, the United Kingdom, the Philippines, Jamaica, Belgium, Japan, Canada and Norway. The majority of participants are highly educated (53% with a degree or postgraduate degree) females with an average age of 42 years. We anticipate the completion of recruitment by early 2015.

EVALUATING DISCUSSION ENGAGEMENT IN AN ONLINE SELF-HELP PROGRAM FOR BIPOLAR DISORDER (www.moodswings.net.au)

Emma Gliddon
PhD candidate

There is growing evidence supporting the use of online adjunctive psychosocial interventions in the treatment of bipolar disorder. Several studies to date have included peer discussion boards, however none of these studies have specifically evaluated the role these boards play in terms of outcomes and attrition, or the influence the level of participant engagement may have on psychosocial variables. This project assesses the MoodSwings 2.0 program, an online self-help program for bipolar disorder. This project evaluates the impact of discussion board engagement on psychosocial outcomes (such as social support, quality of life and stigma) as well as intervention adherence, and attempts to identify key differences between active and passive discussion board users. A qualitative analysis will also be conducted to determine common themes within the discussion board content.

This project involves a three-arm randomised controlled trial, comparing discussion board only, discussion board plus psychoeducation, or discussion board, psychoeducation, and interactive tools. Participants are aged 21 to 65, and diagnosed with bipolar disorder. Recruitment is ongoing, with an international sample target of 300. All participants have access to one of three moderated discussion boards with 100 participants allocated to each. Discussion board engagement is measured by quantity of posts and number of visits. Outcome measures are assessed quarterly both online and by phone. Intervention adherence is monitored by follow up questionnaires, page views, entries within the interactive tools, and duration of page visits.

Recruitment for this program commenced in February 2014. At the end of 2014, there were over 2000 discussion posts across the three treatment groups, and over 80% of participants are utilising the discussion boards in some way.

LINKS BETWEEN ANXIETY AND SMOKING

Dr Steven Moylan
PhD candidate

Anxiety disorders and cigarette smoking commonly occur together. Given the widely known impact of cigarette smoking as a risk factor for the development of other health issues (e.g. cardiovascular disease, lung disease etc.), it is prudent to assess the impact of smoking on the development of anxiety disorders.

This project aimed to assess the association between cigarette smoking and anxiety disorder development, with a focus on how smoking may affect the expression of anxiety in the community. The project has taken data from 3 different population based studies: The Geelong Osteoporosis Study, the Tracing Opportunities and Problems in Childhood and Adolescence (TOPP) Study and the Norwegian Mother and Child Cohort (MoBA). In addition, the project has also incorporated a review of the literature to ascertain what particular biological pathways may underpin any observed effects.

To date, the project has led to 3 publications in journals BMC Medicine, PLoS ONE and Brain & Behavior, with a final two publications under review. The results so far have demonstrated a robust association between smoking and the later development of anxiety, particularly when exposure occurs during rapid developmental phases such as gestation and adolescence. It is predicted the project will be completed by the end of 2014.

This project will provide new insights into the development of normal and pathological anxiety throughout the developmental periods, and how cigarette smoking may interfere with this process. These insights could be utilised in anti-smoking campaigns, and also, as a template for further understanding of what influences the development of anxiety disorders.

Rothanthi Daglas
PhD candidate

A COMPARISON OF NEUROCOGNITIVE FUNCTIONING IN FIRST EPISODE MANIA PATIENTS TREATED WITH QUETIAPINE VS. LITHIUM: A 12 MONTH FOLLOW UP

The notion of complete inter-episodic recovery in bipolar disorder has been challenged in recent years. Evidence has indicated that cognitive impairments exist during both the acute and euthymic episodes of illness. However, the cognitive functioning of individuals during the early stages of illness remains under investigated. The usual treatment for mania is a combination of lithium and antipsychotics. The purpose of this study is to increase our understanding of the effectiveness of lithium and the atypical antipsychotic quetiapine on cognitive changes caused by the early stages of the disease process. A total of 61 participants, who had experienced a first treated manic episode were involved in this study. All participants were aged between 15-25 years and were recruited from Orygen Youth Health and Southern Health sites. After the stabilisation of the acute episode (on the combination of quetiapine and lithium), the participants were randomised to continue either quetiapine or lithium monotherapy. Neuropsychological tests were performed at baseline (within a week of commencing monotherapy), at month 3 and at month 12 follow-up. An additional 30 demographically matched control participants were recruited, with neuropsychological testing conducted at baseline and month 12 follow-up for comparison. Thus far, I have presented my research at 4 conferences, 3 national and 1 international, and have co-authored 6 peer-reviewed publications.

Shae Quirk
PhD candidate

PERSONALITY DISORDERS IN THE COMMUNITY: AN EPIDEMIOLOGICAL STUDY OF THE ASSOCIATION WITH MENTAL AND PHYSICAL HEALTH DISORDERS AND HEALTH SERVICE UTILISATION

Personality disorder might be considered a latent yet critical issue facing Australia's healthcare system. Yet the prevalence of those living with personality disorder in Australian is virtually unknown. In the absence of this data, we do know those living with personality disorder encounter disability and suffer significantly. Just under half of all people with psychiatric disorders have a co-existing chronic physical illness. However, personality disorder and the associated risks for medical comorbidity have not been thoroughly investigated.

From a public health perspective it is essential to plan for and anticipate the health care needs of the Australian population, and for bridging the gap between physical and psychiatric health systems. However the current mental and medical help-seeking behaviours of Australians living with personality disorder are largely unknown. The aim of this project is to investigate the prevalence of personality disorders in Australian women participating in the Geelong Osteoporosis Study (GOS) as well as the associations with physical health conditions and utilization of medical and mental health care.

Our team has now collected data from the female arm of the GOS and will be the first to report epidemiological data on the prevalence of personality disorders in the community, alongside associations with other mental and physical health disorders and health service utilisation.

CLINICAL AND EPIDEMIOLOGICAL STUDIES OF SLEEP

Amie Hayley
PhD candidate

Disruptions to the sleep/wake cycle are recognized to have a variety of negative effects to both physiological and psychological systems. Excessive Daytime Sleepiness (EDS) constitutes a common complaint among patients attending sleep clinics, and epidemiological research has suggested that 12-20% of the general population experience these symptoms. To date, however, there is a paucity of information available investigating the impact of EDS and associated lifestyle and health factors in a representative group of Australian adults. Our research progress within this area has been significant, resulting in five accepted original manuscript publications and several awaiting submission. I have also co-authored two original manuscripts which have appeared in high ranking journals.

I recently attended and presented original research at the European Sleep Research Society (ESRS) annual scientific meeting in Tallinn, Estonia, and was a guest at the University of Bergen, Norway, where I met and collaborated with colleagues in the sleep/epidemiology field. This collaboration resulted in two original manuscripts, that have been submitted for publication.

I am now in the final stages of my candidature, and anticipate that I will soon begin the final write up and edits of the complete thesis document.

THE USE OF MACHINE LEARNING AND DATA MINING IN THE DEVELOPMENT OF A CLINICAL RISK INDEX FOR DEPRESSION

Joanna Dipnall
PhD candidate

In Australia, depressive and anxiety disorders are increasingly common, seemingly affecting people of younger and younger ages. The impact of these psychological disorders on both the individual and society is far-reaching; with a detrimental impact upon the psychological, social and economic elements of everyday life. The aim of this research study is to use machine learning and data mining techniques to identify risk factors for depression so as to develop a clinically useful tool for predicting depression.

This year I designed, developed and published a flexible Database Integration Protocol In Ten-steps (DIPIT). DIPIT ensures the final data are appropriate for the analysis to meet the research objectives, and that legal and ethical requirements are met, along with data definitions being clear, concise, and comprehensive. DIPIT was applied to a large cross-sectional study of the US population to investigate the association between dietary patterns, Type 2 diabetes and depression. This manuscript has been submitted for review. The research was also accepted to be presented to the Society for Mental Health Research (SMHR) 2014 Conference. Further, I am currently performing the statistical analysis to investigate the association between dietary patterns and inflammatory markers, being co-author on this manuscript.

In addition, using the same large US population study, I am currently combining the multitude of behavioural and biological risk factors associated with depression to isolate those with greatest predictive value for depression. From this an index will be developed and tested using a separate database containing longitudinal data.

Kristi-Ann Villagonzalo
PhD candidate

REDOX BIOLOGY AND AUTISM

This study is investigating the efficacy of the antioxidant precursor, N-acetylcysteine (NAC) as a treatment for children with autism. Autism is a pervasive developmental disorder, comprising of impairments in communication and social interaction, as well as repetitive or stereotyped behaviours or interests. Recent evidence has shown children with autism to have imbalances in their antioxidant defences, resulting in oxidative stress and cellular damage. It has been shown that the primary antioxidant in the brain, glutathione, is decreased in these children. This study aims to investigate the effects of increasing the amount of available glutathione by administering NAC. The double blind, randomised trial was completed in early 2014, with a total of 103 children taking part, with half receiving the NAC treatment and the other half receiving a matched placebo. Data analysis is currently underway.

Sarah Dash
PhD candidate

BIOLOGICAL PATHWAYS THAT MEDIATE THE LINK BETWEEN DIET AND DEPRESSION

The bacteria living on and within our bodies-termed "microbiota"- play a significant role in the maintenance of health and balance within many of the body's systems. Bacterial colonisation begins at birth and continues to be influenced across the lifespan by a range of factors including genetics, antibiotic use, geography and, most relevant to this project, diet. The role of microflora to health outcomes and disease risk has been relatively overlooked until recently, partly due to lack of appropriate technology, as well as to the challenges of identifying the type and function of innumerable bacteria. Recent research has linked poor gut health with inflammatory and autoimmune disease, asthma, gastrointestinal disorders and mood and behaviour.

Though the relationship between diet and mental health has now been demonstrated across age groups and various geographic locations, there is still a lack of understanding as to which biological pathways are directly and indirectly involved. As one of the simplest ways to modify microbial composition, dietary change as a means of microbial influence and subsequent mood change has become an interesting area of exploration. With new knowledge of the "gut-brain-axis", the microbiota living in our gut may be an important mediator in the diet-mental health relationship. Depression is one of the most globally burdensome health concerns, and there's great need for viable lifestyle prevention and intervention measures.

This project aims to identify the biological pathways that may be mediating the diet-depression relationship, with particular focus on microbial composition and subsequent inflammation. In doing so, we hope to encourage future research on gut as an important focus area in inflammatory diseases, including depression.

ANTECEDENTS OF AGED CARE SERVICE UTILISATION IN A SAMPLE OF OLDER AUSTRALIANS: PROSPECTIVE DATA LINKAGE USING GOVERNMENT ADMINISTRATIVE RECORDS

Haslinda Gould
PhD candidate

The purpose of my PhD project is to develop risk profiles for aged care service utilisation among older men and women living in the community. In this project, I am investigating clinical risk factors and lifestyle-related exposures that increase the risk for homecare services and residential aged care. The study method involves data linkage between information collected over a period of twenty years from participants enrolled in the Geelong Osteoporosis Study (GOS) and government administrative records. The burgeoning older population in Australia poses a significant challenge to the aged care system, and avoiding or delaying the use of aged care services is likely to have downstream social and economic benefits. This research will provide a sound evidence base that will inform public health messages about healthy ageing and maintaining independence.

GESTATIONAL VITAMIN D AND DEVELOPMENT IN OFFSPRING

Natalie Hyde
PhD candidate

Musculoskeletal conditions are currently a National Health Priority Area. At present, 1.2 million Australians are suffering from osteoporosis, further compounded by another 6.3 million who are osteopenic, the disease state before full progression. An estimated $1.9 billion was spent on direct cost of care and a further $5.6 billion expended on indirect costs in the 2000-1 financial year. In light of the ageing population this figure is expected to treble within the next 20 years. From a public health standpoint, prevention is a far superior outcome than a cure. Maternal vitamin D level during pregnancy is a potential target for both the prevention of the disease and a decreased morbidity, which may substantially alleviate the economic burden.

A significant number of Australian women, including those of reproductive age, have low vitamin D levels. Gestational vitamin D insufficiency is a cause for concern, not only for the maternal health, but because it also exposes the offspring to insufficiency during potentially critical stages of development. It is known that vitamin D deficiency in infancy and childhood affects bone health and muscle function. It is thus an important public health issue to determine whether gestational vitamin D levels impact upon musculoskeletal and other areas of health in the offspring.

The Vitamin D in Pregnancy (VIP) study's initial findings showed impaired growth and development in offspring born to vitamin D deficient mothers. The study is currently in its final stages of recruitment for its 10 year follow-up phase and aims to determine whether these observed effects are transient or maintained into childhood.

Currently much conjecture exists with regards to optimal vitamin D levels during pregnancy for ideal offspring development and thus there is a vital need for new data that policy makers and practitioners can use to formulate an evidence-based healthcare approach to vitamin D nutrition and sunlight exposure during pregnancy.

Lelia de Abreu
PhD candidate

DYSGLYCAEMIA IN WOMEN

Lelia was enrolled as a PhD candidate with the IMPACT SRC team in August 2014. She joins our team from Brazil after completing a Bachelor of Nursing and a Masters in Nursing, with a focus on diabetes. She has also worked in the Public Health sector as a registered nurse for a number of years.

Her research interests include diabetes, gestational diabetes, obesity and metabolic syndrome. Her PhD project, supervised by Professor Julie Pasco, Dr Mark Kotowicz and Dr Kara Holloway, is focussed on diabetes and pre-diabetes in female participants of the Geelong Osteoporosis Study. She will be describing the epidemiology of diabetes and pre-diabetes in the Barwon Statistical Division. In addition, she will also be determining risk factors for developing diabetes as well as investigating associations between diabetes and mental health, healthcare utilisation, fractures and mortality.

Sarah Hosking
PhD candidate

OSTEOPOROSIS, HEALTH LITERACY AND HEALTH SERVICE UTILISATION: INFORMING THE EVIDENCE-BASE TO IMPROVE OSTEOPOROSIS PREVENTION AND RELATED HEALTHCARE

Health literacy relates to the wide range of skills an individual requires to effectively manage their own health. At its most basic level, health literacy refers to the ability to read and comprehend health information such as nutrition labels, public health messages and instructions for taking medications and is referred to as functional health literacy. As the concept of health literacy has developed it has grown to include interactive health literacy, which refers to the social skills required to access health care and communicate effectively with health professionals and critical health literacy which refers to the ability to critically analyse health information in order to make the most appropriate health choices.

There is a growing body of evidence relating health literacy to a number of different health outcomes but little is currently known about health literacy with regards to osteoporosis. As prevention is key to reducing the direct and indirect costs of osteoporosis on individuals and the community, a greater understanding of how at risk populations access and understand messages about osteoporosis prevention would help to tailor health messages and improve the effectiveness of public health initiatives and interventions.

This project aims to investigate potential links between health literacy, knowledge of osteoporosis prevention guidelines and utilisation of health services. This information will help to ensure that in the future we will be better placed to develop interventions to support the effective translation of osteoporosis prevention guidelines for the Australian public.

DISSOCIATION AND CHANGES IN THE PERCEPTION OF TIME

This doctoral study aims to combine a number of research methods to better understand how the perception of time is altered in psychiatric disease. It has involved an ongoing collaboration between the Department of Clinical and Biomedical Sciences and the Department of Physiology, Development and Neuroscience at the University of Cambridge, as well as Barwon Medical Imaging. In particular, the research focuses upon changes in the perception of the "flow" of time and ordering of events.

Dr Frank Giorlando
PhD candidate

Over the last year, analysis of fMRI and EEG imaging data have revealed that temporal perception involves specific brain activity in regions including the claustrum and cingulate cortex. These findings continue the process of unravelling the neurological foundations of time perception.

Our studies have shown that changes in time perception accompany mood changes in bipolar disorder and that we can measure the changes in brain activity that accompany specific time estimation measures. Importantly there is a strong linkage between time perception and dissociative symptoms which we hope to explore further in different populations with mental illness.

Ongoing funding for 2014

1) NHMRC (APP 1061043). Centres of Research Excellence (CRE) for Funding. Centre of Research Excellence for optimising early interventions for young people with emerging mood disorder. Hickie I, McGorry P, Christensen H, Berk M, Naismith S, Glozier N, Burns J, Guastella A, Davey C, Amminger P. Administering Institution University of Sydney. $2,499,420. 2013.

2) NHMRC Project Grant (APP1027315). Proof of principle of the inflammatory and oxidative theory of depression: A treatment study. CIs: Berk M, Chanen A, Harrigan S, Davey C, Hetrick S, Dean O, Dodd S. $1,475,510.00 over 5 years. 2012-2016.

3) NHMRC Project Grant (APP 1021347). Diet as a therapeutic target in depression: A randomised controlled trial. 3 years commencing 2012, extended to 2015. CIs: Berk M, Jacka F, Castle D, Brazens L, Itsiopoulos C. $481,810.

4) NHMRC Project Grant (APP1009367). Selective Serotonin Reuptake Inhibitors (SSRIs) and bone mineral density: Mechanisms and clinical consequences. Investigators: Williams LJ, Hodge JM. $409,140. 2011-2013, completed end 2014.

5) NHMRC Project Grant (APP 628582). Geelong Osteoporosis Study: Fracture risk prediction based on twenty years of prospective data. Investigators: Pasco JA, Nicholson GC, Kotowicz MA, Henry MJ, Evans D. $910,400. 2010-2013, extended into 2014.

6) NHMRC Project Grant (APP1021345). Providing evidence for the primary prevention of the high-prevalence mental disorders in men: the role of diet in the aetiology of depression, anxiety, and psychological distress. Investigators: Jacka FN, Berk M, Pasco JA, Williams LJ. $292,900. 2012-2014.

7) NHMRC Postgraduate Scholarships Grant (APP1076347). Personality disorders in the community. Quirk S. $31,886.83. 2013-2015.

8) NHMRC Early Career Fellowship (GNT1012472). Examining psychosocial determinants of osteoporosis. Brennan SL. 2011-2014.

9) NHMRC Project Grant (APP 628582). Geelong Osteoporosis Study: Fracture risk prediction based on twenty years of prospective data. Pasco JA, Nicholson GC, Kotowicz MA, Henry MJ, Evans D. $910,400. 2010-2013, extended into 2014.

10) NHMRC Project Grant (APP 1026307). The Efficacy of N-acetylcysteine as an adjunctive treatment in bipolar depression: A double-blind, randomised, placebo-controlled trial. Berk M, Dean O, Cotton S, Dodd S. AUD $930,844.00 over 3 years. 2012–2014.

11) NHMRC Postgraduate Scholarship (GNT1076347). Personality disorders in the community: an epidemiological study. Quirk SE. 2014.

12) NARSAD Young Investigator Grant. Minocycline as an adjunctive treatment for depression. Investigator: Olivia Dean. $59,225. 2012 (ongoing).

13) Australian Rotary Health/Ian Parker Bipolar Research Fund PhD Scholarship. Assessing an online psychotherapy program for bipolar disorder. Gliddon E. $87,000. 2013-2015.

14) Meat & Livestock Australia. Characterisation of dietary intakes and nutritional status of people with major depression and exploration of associated biological mechanisms Jacka F, Itsiopoulos C, O'Neil A, Szymlek-Gay E, Castle D, Berk M. $250,000. 2013-2016.

15) Stanley Medical Research Institute. D-fend – Vitamin D First Episode Neuroprotection Design. Randomised clinical trial. SMRI Grant Application 13TAF-1687. Gaughran F, McGrath J, Smith S, McGuire P, Berk M, Taylor D. $1,443,293. 2013-2015.

16) NIH R34 grant. A randomized trial of Internet based interventions for bipolar disorder – Moodswings 2.0. CIs: Berk M, Suppes T, Castle D, Cosgrove V. Lauder S, Berk L. Total budget is $436,612 USD over 3 years. 2013-2015.

17) BUPA Foundation. Maternal vitamin D in pregnancy and childhood growth. Pasco JA, Wark JD. $189,000. 2012-2015.

18) Australian Postgraduate Award. Gestational vitamin D and development in offspring. Hyde N. $76,175. 2013-2015.

19) Australian Rotary Health /Ian Parker Bipolar Research Fund PhD Scholarship. Assessing an online psychotherapy program for bipolar disorder. Gliddon E. $87,000. 2013-2015.

Successful Grants 2014

1) NHMRC Established Career Fellowship. APP1059660. Novel therapies, risk pathways and prevention of mood disorders. Berk M. (GNT1064272). $822,925. 2014-2018.

2) NHMRC Career Development Fellowship (APP1064272). Psychiatric disorders, psychotropic agents and bone health: From bench top to bedside. Williams L. $404,884. 2014-2018.

3) NHMRC Project Grant (APP1078928). Gene Expression Signature Technology to Repurpose Drugs for Bipolar Disorder. Walder K, Berk M, Leboyer M. : $467,203.00. 2015-2017.

4) NHMRC Project Grant (APP1081901). ASPREE-D; Aspirin in the prevention of depression in the elderly. CIA: Berk M, McNeil J, Neilson M, Shah R, Woods R, Mohebbi M. $767,593.70. 2015-2018.

5) NHMRC TCR (APP1042666). The Fish Oil Youth Depression Study: A randomised, double blind, placebo-controlled treatment trial. Amminger, McGorry, Hickie, Yung, Mackinnon, Berk, Davey, Hermens. $1,150,425. 2014.

6) Alfred Deakin Postdoctoral Research Fellowship. Investigation of the psychosocial and socioeconomic disparities in osteoporosis and the uptake of osteoporosis-related healthcare using a multi-disciplinary approach. Brennan-Olsen S. 2015-2016.

7) Lundbeck Institute Award from the Australasian Society for Psychiatric Research (ASPR). Jacka F. $1000. Dec 2013.

8) Deakin Vice-Chancellor's Early Career Research Award for Research Excellence. Brennan SL. $5000. 2014.

9) Brazilian Society Mobility Program "Ciências sem Fronteiras". Dean OM. R$235,308.44. 2014.

10) Research Equipment Support Scheme, Deakin University. 3D Bioprinting Facility for Organ and Food Printing Research. ID: RM27615. Kouzani, Kanwar, Berk, Keast, Francis, Littlefair, Gibson, Kong, Kaynak, Khoo. $115,000. 2014.

11) Centre for Quality and Patient Safety (QPS) Research, Deakin University. Identifying predictors for clinical deterioration in telephone-based mental health triage. Sands N, Considine J, Elsom S, Keppich Arnold S, Corbett R, Berk M. $23,905. 2014.

12) Simons Foundation Autism Research Initiative - SFARI. Pilot Grant. Efficacy of N-Acetyl Cysteine in Autism. 2 years. Berk, Dodd, Dean, Gray, Tonge. $244,256

13) AstraZeneca D1443C00002: Neuroprotective Properties of Quetiapine versus Lithium in a First Episode Mania Cohort: 12-month Neuroanatomical, Neurochemical and Neuro-cognitive Effects and Preliminary Data of Prophylactic Properties. Berk, Hallam, Lucas, Macneil, Hasty, Kader, O'Regan, Callaly, Conus, Damodoran, Brotchie, Pantelis, Yucel, McGorry. $1.68 million.

14) Stanley #14T-007. The efficacy of adjunctive Garcinia mangostana Linn (mangosteen) pericarp for the treatment of Schizophrenia: A double-blind, randomized, placebo-controlled trial. Berk, McGrath, Dean, Dodd, Cotton. Three years. 2015-2017. $899,398.

15) Simons Foundation Autism Research Initiative – SFARI #201473. 2012-2015. Pilot Grant. Efficacy of N-Acetyl Cysteine in Autism. 2 years. Berk, Dodd, Dean, Gray, Tonge. $244,256.

16) AstraZeneca D1443C00002: Neuroprotective Properties of Quetiapine versus Lithium in a First Episode Mania Cohort: 12-month Neuroanatomical, Neurochemical and Neuro-cognitive Effects and Preliminary Data of Prophylactic Properties. Berk, Hallam, Lucas, Macneil, Hasty, Kader, O'Regan, Callaly, Conus, Damodoran, Brotchie, Pantelis, Yucel, McGorry. $1.68 million.

17) Cooperative Research Centres: CRC for Mental Health. Program leaders are Professor Ralph Martins (Edith Cowan University) Professor Colin Masters (Mental Health Research Institute) and Professor Mal Horne (Florey Neurosciences Institute) Professor Ian Everall (the University of Melbourne), Professor Brian Dean (Mental Health Research Institute), Professor Assen Jablensky (University of Western Australia) and Professor Michael Berk (Barwon Health). Seven years commencing 2011: $23.1 million.

18) Deakin University Central Research Grant Scheme (CRGS). Does including depression in the Framingham Cardiovascular Risk Equation improve its predictive ability in women? O'Neil A, Pasco JA, Lewandowski P, Williams LJ, Berk M, Atherton J, Fisher A. 2014. $20,000.

19) Western Alliance. Chronic disease, injury and ageing in Western Victoria: opportunities to improve health delivery. Pasco JA, Kotowicz MA, Livingston T, Khasraw M, Hakkennes S, Dunning T, Brumby S, Page R, Pedler D, Sutherland A, Venkatesh S. 2015-16. $100,000.

Publications 2014

1) Malhi GS, Bargh DM, Coulston CM, Das P, Berk M. Predicting bipolar disorder on the basis of phenomenology: implications for prevention and early intervention. Bipolar Disord. 2014; 16(5):455-470.

2) Sanna L, Stuart AL, Pasco JA, Kotowicz MA, Berk M, Girardi P, Brennan SL, Williams LJ. Suicidal ideation and physical illness: does the link lie with depression? Journal of Affective Disorders. 2014:152-154:422-426.

3) Anderson G, Berk M, Dean O, Moylan S, Maes M. Role of Immune-Inflammatory and Oxidative and Nitrosative Stress Pathways in the Etiology of Depression: Therapeutic Implications. CNS Drugs. 2014;28(1): [In press]. DOI 10.1007/s40263-013-0119-1.

4) Kulkarni J, Berk M, Wang W, Mu L, Scarr E, Van Rheenen TE, Worsley R, Gurvich C, Gavrilidis E, de Castella A, Fitzgerald P, Davis SR. A four week randomized control trial of adjunctive medroxyprogesterone and tamoxifen in women with mania. Psychoneuroendocrinology. 2014;43:52-61.

5) Berk M, Moylan S, Jacka F. A Royal gift to prevention efforts. Aust NZ J Psychiatry. 2014;48(2):110-111.

6) Williams LJ, Berk M, Henry MJ, Stuart AL, Brennan SL, Jacka FN, Pasco JA. Depression following fracture in women: a study of age-matched cohorts. BMJ Open. 2014;4(2):e004226. doi: 10.1136/bmjopen-2013-004226.

7) Stange JP, Sylvia LG, Magalhães PV, Miklowitz DJ, Otto, MW, Frank E, Berk M, Hansen NS, Dougherty DD, Nierenberg AA, Deckersbach T. Extreme attributions predict suicidal ideation and suicide attempts in bipolar disorder: prospective data from STEP-BD. Letter to the editor. World Psychiatry 2014;13(1):95-96.

8) Nunes SOV, Pizzo de Castro MR, Watanabe MAE, Guembarovski RL, Vargas HO, Reiche EMV, Morimoto HK, Dodd S, Berk M. Genetic polymorphisms in glutathione-S-transferases are associated with anxiety and mood disorders in nicotine dependence. Psychiatric Genetics. 2014;24(3):87-93.

9) Bortolasci CC, Vargas HO, Souza-Nogueira A, Barbosa DS, Moreira EG, Nunes SOV, Berk M, Dodd S, Maes M. Lowered plasma paraoxonase (PON)1 activity is a trait marker of major depression and PON1 Q192R gene polymorphism-smoking interactions differentially predict the odds of major depression and bipolar disorder. Journal of Affective Disorders. 2014;159:23-30.

10) Thompson J, Berk M, O'Donnell M, Stafford L, Nordfjaern T. Attributions of responsibility and recovery within a no-fault insurance compensation system. Rehabilitation Psychology. 2014; 59(3):247-55.

11) Morris G, Anderson G, Dean O, Berk M, Galecki P, Martin-Subero M, Maes. M. The Glutathione System: A New Drug Target in Neuroimmune Disorders. Mol Neurobiol. 2014; [Epub ahead of print] PMID: 2475259.

12) Berk M, Dean OM, Cotton SM, Jeavons S, Tanious M, Kohlmann K, Hewitt K, Moss K, Schapkaitz I, Robbins J, Cobb H, Ng F, Dodd S, Bush AI, Malhi GS. The Efficacy of Adjunctive N-Acetylcysteine in Major Depressive Disorder: A Double-Blind, Randomized, Placebo-Controlled Trial. J Clin Psychiatry 2014;75(6):628-636.

13) Jacka FN, Sacks G, Berk M, Allender S. Food policies for physical and mental health. Biomed Central Psychiatry. 2014;14:132.

14) Malhi GS, Berk M. Diagnosing bipolar disorder: defining thresholds and setting boundaries. Australian & New Zealand Journal of Psychiatry. 2014;48(6):S00-S04.

15) Moylan S, Berk M, Dean OM, Samuni Y, Williams L, O'Neil A, Hayley AC, Pasco JA, Anderson G, Jacka F, Maes M. Oxidative & nitrosative stress in depression: why so much stress? Neuroscience and Biobehavioral Reviews. 2014;45:46-62.

16) Martin-Subero M, Berk L, Dodd S, Kamalesh V, Maes M, Kulkarni J, De Castella A, Fitzgerald PB, Berk M. Quality of life in bipolar and schizoaffective disorder – a naturalistic approach. Comprehensive Psychiatry. 2014;55(7):1540-1545.

17) Berk M, Berk L, Denton T. Psychiatric disorders in primary care. Australian & New Zealand Journal of Psychiatry 2014;48(6):497-499 .

18) Vargas HO, Nunes SOV, Barbosa DS, Vargas MM, Cestari A, Dodd S, Venugopal K, Maes M, Berk M. Castelli risk indexes 1 and 2 are higher in major depression but other characteristics of the metabolic syndrome are not specific to mood disorders. Life Sciences. 2014;102:65-71.

19) O'Neil A, Berk M, Venugopal K, Kim SW, Williams LJ, Jacka FN. The association between poor dental health and depression: findings from a large-scale, population-based study (the NHANES study). General Hospital Psychiatry. 2014;36(3):266-70.

20) Debnath M, Berk M. Th17 pathway – mediated immunopathogenesis of schizophrenia: mechanisms and implications. Schizophrenia Bulletin. 2104;40(6):1412-1421.

21) Asevdeo E, Mendes AC, Berk M, Brietzke E. Systematic review of N-acetylcysteine in the treatment of addictions. Revista Brasileira de Psiquiatria. 2014;36(2):168-175.

22) Aydemir O, Cubukçuo Lu Z, Erdin S, Tas C, Onur E, Berk M. Oxidative stress markers, cognitive functions, and psychosocial functioning in bipolar disorder: an empirical cross-sectional study. Revista Brasileira de Psiquiatria. 2014;[Epub ahead of print].

23) Bechdolf A, Ratheesh A, Cotton SM, Nelson B, Chanen AM, Betts J, Bingmann T, Yung AR, Berk M, McGorry PD. The predictive validity of bipolar at-risk (prodromal) criteria in help-seeking adolescents and young adults: a prospective study. Bipolar Disorders. 2014;16(5):493-504.

24) Deckersbach T, Peters AT, Sylvia L, Urdahl A, Magalhães PV, Otto MW, Frank E, Miklowitz DJ, Berk M, Kinrys G, Nierenberg A. Do Comorbid Anxiety Disorders Moderate the Effects of Psychotherapy for Bipolar Disorder? Results From STEP-BD. Am J Psychiatry. 2014; 171(2):178-186.

25) Smesny S, Milleit B, Hipler U-C, Milleit C, Schafer MR, Klier CM, Holub M, Holzer I, Berger GE, Otto M, Nenadic I, Berk M, McGorry PD, Sayuer H, Amminger GP. Omega-3 fatty acid supplementation changes intracellular phospholipase A2 activity and membrane fatty acid profiles in individuals at ultra-high risk for psychosis. Molecular Psychiatry. 2014;19(3)17-324.

26) Morris G, Berk M, Galecki P, Maes M. The Emerging Role of Autoimmunity in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/cfs). Mol Neurobiol. 2014; 49(2):741-56.

27) Anderson G, Berk M. Maes M. Biological phenotypes underpin the physio-somatic symptoms of somatization, depression, and chronic fatigue syndrome. Acta Psychiatrica Scandinavica. 2014;129(2):83-97.

28) Maes M, Anderson G, Kubera M, Berk M. Targeting classical IL-6 signalling or IL-6 trans-signalling in depression? Expert Opin Ther Targets, 2014;18(5):495-512.

29) Sarris J, O'Neil A, Coulson CE, Schweitzer I, Berk M. Lifestyle medicine for depression. BMC Psychiatry. 2014;14:107.

30) Carvalho AF, Berk M, Hyphantis TN, McIntyre RS. The integrative management of treatment-resistant depression: a comprehensive review and perspectives. Psychotherapy and Psychosomatics. 2014;83(2):70-88.

31) Hayley AC, Williams LJ, Kennedy GA, Berk M, Brennan SL, Pasco JA. Prevalence of excessive daytime sleepiness in a sample of the Australian adult population. Sleep Medicine. 2014;15(3):348-54.

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33) Tran T, Luo W, Phung D, Harvey R, Berk M, Kennedy RL, Venkatesh S. Risk stratification using data from electronic medical records better predicts suicide risks than clinician assessments. BioMed Central Psychiatry. 2014;14:76.

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37) Sanna L, Stuart AL, Pasco JA, Jacka FN, Berk M, Maes M, O'Neil A, Girardi P, Williams LJ. Atopic disorders and depression: findings from a large, population-based study. Journal of Affective Disorders. 2014 Feb;155:261-265.

38) Giorlando F, Markanday S, Anderson A, Carpenter R, Berk M. Temporal order assessment in patients with bipolar disorder. Procedia Social and Behavioral Sciences. 2014;126(21):216.

39) Carvalho AF, McIntyre RS, Dimelis D, Gonda X, Berk M, Nunes-Neto PR, Cha DS, Hyphantis TN, Angst J, Fountoulakis KN. Predominant polarity as a course specifier for bipolar disorder: A systematic review. Journal of Affective Disorders. 2014; J Affect Disord. 2014 Jul;163:56-64.

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Conference presentations 2014

Inaugural Social Equity Conference, Melbourne. February 2014.	• Brennan SL, Hosking SM, Dobbins AG, Pasco JA. The making of an oversized jigsaw: A collaborative encounter between researchers and disadvantaged communities. ORAL.
Inaugural Social Equity Conference, Melbourne. February 2014.	• Brennan SL, Lane SE, Lorimer M, Buchbinder R, Wluka AE, Page R, Osborne R, Pasco JA, Sanders KM, Cashman K, Ebeling PR, Graves SE. Socioeconomic patterning of primary total knee joint replacements performed for osteoarthritis across Australia 2003-10: Data from the Australian Orthopaedic Association National Joint Replacement Registry. POSTER.
The International Society for Bipolar Disorders (ISBD), Seoul, South Korea. March 2014.	• Berk M, Pasco JA, Jacka FN, Hodge JM, Stuart A and Williams LJ. Osteoporosis: A neglected medical comorbidity in mood disorders. POSTER.

Seoul, Korea, International Society of Bipolar Disorders. March 2014.	• Berk M. Preventing depressive episodes in bipolar disorder – Integrative maintenance therapy. KEYNOTE. • Berk M. Novel treatments. KEYNOTE. • Berk M. Novel therapies and mechanisms. KEYNOTE. • Berk M. The mitochondrion as a therapeutic target in bipolar disorder. KEYNOTE.
Australian Grief and Bereavement Conference, Melbourne. March 2014.	• Burke L. Lessons from Bipolar Disorder: How to enfranchise grief in psychiatry and clinical psychology. ORAL.
4th Biennial Schizophrenia International Research Conference, Florence, Italy. April 2014.	• Dodd S. Staging and Neuroprotection. ORAL.
RANZCP Congress Perth. May 2014.	• Singh A. Diapason study, improving recovery in major depression. ORAL. • Singh A. Antidepressant Pharmacogenetics. ORAL. • Singh A. Diapason study, improving recovery in major depression. ORAL.
Melbourne, Australia, The Australian & New Zealand Society for Geriatric Medicine (ANZSGM). May 2014.	• Berk M. Can we prevent depression? KEYNOTE.
Gold Coast, Australia, 4th Science of Nutrition in Medicine Conference, May 2014.	• Berk M. Novel therapies: translation, validation and implementation. KEYNOTE.
The 10th International Conference on Grief and Bereavement in Contemporary Society (ICGB), Hong Kong, China. June 2014.	• Burke L, Pasco JA, Williams LJ, Hallam K, Berk M. The relationship between age of marriage and age of death in an Australian community-based sample. ORAL.
American Society of Clinical Psychopharmacology Annual Meeting. Florida, USA. June 2014.	• Cosgrove V, Suppes T, Lauder S, Gliddon E, Raju K, Dodd S, Fischer EG, Berk M. MoodSwings 2.0 (www.moodswings.net.au): An online intervention for bipolar disorder. ORAL.

European Sleep Research Society (ESRS) 22nd Congress, Tallinn, Estonia. September 2014.	• Hayley A. Excessive Daytime Sleepiness and Metabolic Syndrome: A population based study of women. POSTER.
ANZBMS, Queenstown, New Zealand. September 2014.	• Brennan SL, Bucki-Smith G, Dobbins AG, Holloway KL, Pasco JA. Social disadvantage and incident fractures of the major osteoporotic sites: Data from the Geelong Osteoporosis Study Fracture Grid. ORAL. • Holloway KL, Kotowicz MA, Lane SE, Brennan SL, Pasco JA. FRAX (Aus) as a predictor of falls risk in men and women. POSTER. • Hosking SM, Dobbins AG, Pasco JA, Brennan SL. Knowledge change regarding osteoporosis prevention: translating recommended guidelines into user-friendly messages for the community. POSTER. • Hyde NK, Brennan SL, Wark JD, Moloney DJ, Pasco JA. Puffing during pregnancy; are we compromising offspring bone development? Christopher and Margie Nordin nomination. POSTER • Pasco JA, Lane S, Brennan SL, Holloway KL, Bucki-Smith G, Kotowicz MA. Appendicular lean mass, BMD and fracture risk. PLENARY POSTER.
American Society for Bone and Mineral Research (ASBMR), Houston, Texas, USA. September 2014.	• Brennan SL, Yan L, Lix LM, Morin SN, Majumdar SR, Leslie WD. Sex-specific associations between income and incident fractures at major osteoporotic sites: A population-based analysis. (Sponsored by Sharon Brennan). POSTER. • Holloway KL, Kotowicz MA, Lane SE, Brennan SL, Pasco JA. FRAX (Aus) as a predictor of falls risk in men. (Sponsored by Mark Kotowicz). POSTER. • Pasco JA, Brennan SL, Holloway KL, Moloney DJ, Kotowicz MA. Do strong women have strong bones? (Sponsored by Julie Pasco). POSTER. • Rauma P, Pasco JA, Berk M, Stuart AL, Honkanen RJ, Koivumaa-Honkanen H, Hodge JM, Williams LJ. The association between use of antidepressants and bone quality using Quantitative Ultrasound. (Sponsored by Risto Honkanen). POSTER.

The 8th World Congress on the Promotion of Mental Health and the Prevention of Mental London, UK. Disorders. September 2014.	• Jacka F. Taking a population health approach to the primary prevention of mental disorders. ORAL.
Vrije Universiteit Amsterdam, Netherlands. September 2014.	• Jacka F. How does diet exert an influence on mental health? KEYNOTE.
Monkwearmouth Hospital London. September 2014.	• Jacka F. Diet and the common mental disorders: mechanisms of action and new opportunities for prevention and treatment. KEYNOTE.
St. Nicholas Hospital, London. September 2014.	• Jacka F. Can we prevent depression by improving diet? KEYNOTE.
APC/Dept. Neuroscience & Anatomy Seminar. University College Cork, Cork, Ireland. September 2014.	• Jacka F. Diet quality and mental health across the lifespan: updates & new directions. KEYNOTE.
University of Valencia, Valencia, Spain. September 2014.	• Jacka F. Diet quality and mental health across the lifespan: updates & new directions. KEYNOTE.
European Sleep Research Society scientific conference. Tallinn, Estonia. September 2014.	• Hayley A, Williams LJ, Kennedy GA, Berk M, Pasco JA. Excessive daytime sleepiness and metabolic syndrome: A population-based study of women. POSTER.
Canadian Academy of Psychiatric Epidemiology. Canada. September 2014.	• Quirk S, Berk M, Pasco J, Brennan S, Chanen A, Burke L, Williams L. The prevalence of DSM-5 personality disorders in Australian women. POSTER.

XVI World Congress of Psychiatry (WPA). Madrid, Spain. October 2014.	• Berk M. The evolution continues? CANMAT clinical guidelines for bipolar disorders 2013. ORAL. • Berk M. Clinical assessment of neurocognition – the basis for improved clinical outcomes. ORAL. • Berk M. Novel therapies. KEYNOTE. • Jacka F. Nutritional Psychiatry Research: A topic comes of age and an international society is established. Talk: "Jacka F. Diet quality and mental health across the lifespan". ORAL. • Dean O. New therapeutics targeting inflammation in psychiatry. ORAL.
Austin Health Research Week, e-poster session. Melbourne, Australia. October 2014.	• Hayley AC, Williams L, Holloway K, Kennedy GA, Pasco JA, Berk M. Excessive daytime sleepiness and falls among older women: Examination of a community-based sample. POSTER.
Biological Psychiatry Australia Conference. Melbourne. October 2014.	• Dean O. Symposium chair and speaker: Novel therapies for psychiatric disorders. SYMPOSIUM CHAIR AND SPEAKER.
49th Australian Psychological Society Annual Conference. Hobart, Australia. October 2014.	• Gliddon E, Lauder S, Berk L, Berk M. Lurking and posting in the MoodSwings online discussion boards for bipolar disorder. POSTER. • Lauder S, Cosgrove V, Gliddon E, Berk L, Gwizdowski I, Fischer EG, Dodd S, Grimm D, Raju K, Suppes T, Berk M. MoodSwings 2.0: Evaluating an online self-help intervention for bipolar disorder (www.moodswings.net.au). POSTER.
Barwon Health Research Week, Geelong. October 2014.	• Brennan SL, Bucki-Smith G, Dobbins AG, Hosking SM, Holloway KL, Kotowicz MA, Pasco JA. A social gradient exists for incident fractures of the major osteoporotic sites: Data from the Geelong Osteoporosis Study Fracture Grid. POSTER AND ORAL. • Gliddon E, Lauder S, Berk L, Berk M. Testing the waters or diving straight in? A preliminary analysis of discussion board engagement in the MoodSwings online intervention for bipolar disorder (www.moodswings.net.au). POSTER. • Hyde NK, Brennan SL, Wark JD, Moloney DJ, Pasco JA. Puffing during pregnancy; are we compromising offspring bone development? Christopher and Margie Nordin nomination. POSTER.

Asia Pacific Paediatric Endocrine Society/Australasian Paediatric Endocrine Group Joint Meeting, Darwin. October-November 2014.	• Kwon D, Harris C, Khot A, Kriser D, Liew D, Brennan SL, Ebeling P, Rodda C. High incidence of vitamin D deficiency in 2-17 year olds presenting with fracture to a Melbourne suburban public hospital. ORAL.
International Osteoporosis Foundation (IOF) Regionals 5th Asia-Pacific Osteoporosis Meeting in Taipei. November 2014.	• Holloway KL, Henry MJ, Brennan SL, Kotowicz MA, Bucki-Smith G, Nicholson GC, Korn S, Sanders K, Pasco JA. Non-hip and non-vertebral fractures: the neglected fracture sites. POSTER.
Australasian Chronobiology Society (ACS) 11th Annual Conference. Melbourne. November 2014.	• Hayley AC. Excessive daytime sleepiness and falls among older adults: cross-sectional examination of a community-based sample. POSTER.
BiomedLink Student Conference. November 2014.	• Hosking SM, Dobbins AG, Pasco JA, Brennan SL. Knowledge change regarding osteoporosis prevention: translating recommended guidelines into user-friendly messages for the community. POSTER. • Hyde NK, Brennan SL, Wark JD, Moloney DJ, Bennett K, Pasco JA. Puffing during pregnancy: Are we compromising offspring bone development? POSTER.
3rd Annual NHMRC Symposium on Research Translation. Melbourne. November 2014.	• Brennan SL, Hosking SM, Dobbins AG, Pasco JA. An oversized jigsaw: translating recommendations for the prevention of osteoporosis. POSTER. • Oldenburg B, Teede H, Brennan SL, Cocker D, Oldroyd J, Willis C, Best A. A call to action: Improving Australia's health through research focused on "how to implement" what we already know. POSTER. • Pasco JA, Foulkes C, McKenzie S, Brennan SL. A conduit between epidemiological research and regional health policy. POSTER.

IOF Regionals 5th Asia-Pacific Osteoporosis Meeting, Taipei, Taiwan. November 2014.	• Brennan SL, Bucki-Smith G, Dobbins AG, Holloway KL, Kotowicz MA, Moloney DM, Pasco JA. Associations between social disadvantage and fractures at all skeletal sites: Data from the Geelong Osteoporosis Study Fracture Grid. POSTER. • Holloway KL, Henry MJ, Brennan SL, Kotowicz MA, Bucki-Smith G, Nicholson GC, Korn S, Sanders KM, Pasco JA. Non-hip and non-vertebral fractures: the neglected fracture sites. POSTER. • Pasco JA, Lane S, Brennan SL, Holloway KL, Bucki-Smith G, Kotowicz MA. Appendicular lean mass and the risk for hip and upper limb fractures. POSTER.
International Society on Priorities in Health Care, Melbourne. November 2014.	• Brennan SL, Kotowicz MA, Hosking SM, Williams LJ, Dobbins AG, Pasco JA. Acknowledging the social gradient of osteoporosis: a fundamental priority to address social inequity in fracture risk and related healthcare. POSTER. • Holloway KL, Brennan SL, Dobbins AG, Timney EN, Bucki- Smith G, Williams LJ, Kotowicz MA, Pasco JA. Prior fracture as a risk factor for future fracture in an Australian cohort. ORAL. • Hosking SM, Dobbins AG, Pasco JA, Brennan SL. Prioritizing community engagement in the development of an oversized jigsaw for the translation of osteoporosis prevention guidelines. POSTER. • Pasco JA, Brennan SL, Holloway KL, Nicholson GC, Kotowicz MA. Is musculoskeletal deterioration among men an unrecognised consequence of the obesity epidemic? ORAL.
53rd American College of Neuropsychopharmacology Conference. Arizona, USA. December 2014.	• Cosgrove V, Raju K, Gliddon E, Lauder S, Berk L, Grimm D, Castle D, Dodd S, Ostacher M, Berk M, Suppes T. MoodSwings 2.0 (www.moodswings.net.au): An online intervention for bipolar disorder – Report from the front. POSTER.
Mental Health Association of Hong Kong 60th Anniversary Symposium. Hong Kong. December 2014.	• Berk M. "Prevention of common mental disorders – the way forward for prevention research and implementation". KEYNOTE. • Berk M. Prevention of Depression – Lifestyle Management of Unipolar Depression. KEYNOTE.

SMHR 2014: The Society for Mental Health Research, Adelaide. December 2014.	• Dipnall J, Pasco JA, Meyer D, Berk M, Williams LJ, Dodd S, Jacka FN. Diet and the depressed diabetic: New insights from post-hoc analyses of the US National Health and Nutrition Examination Study. ORAL. • Quirk S, Berk M, Pasco J, Brennan S, Chanen A, Burke L, Williams L. The prevalence of DSM-5 personality disorders in Australian women. • Rauma PH, Pasco JA, Berk M, Stuart AL, Koivumaa-Honkanen H, Honkanen RJ, Hodge JM, Williams LJ. Major depressive disorder, use of antidepressants and bone mineral density (BMD). ORAL. • Berk M. Nocebo effects in the treatment of major depression: results from an individual study participant level meta-analysis of the placebo arm of duloxetine clinical trials. POSTER. • Gliddon E, Lauder S, Berk L, Berk M. Testing the waters or diving straight in? A preliminary analysis of discussion board engagement in the MoodSwings online intervention for bipolar disorder (www.moodswings.net.au). ORAL. • Dodd S, Schacht A, Kelin K, Duenas H, Reed VA, Williams LJ, Quirk FH, Malhi GS, Berk M. Nocebo effects in the treatment of major depression: results from an individual study participant level meta-0analysis of the placebo arm of duloxetine clinical trials. ORAL. • Skvarc D, Dean O, Byrne L, Lewis M, Lane S, Gray L, Osborne C, Berk M, Marriott A. PANACEA: the Post Anaesthesia N-Acetyl-Cysteine evaluation trial. ORAL. • Toben C, Jacka F, Daglas R, Immink M, Anton R. Neuroprotection and neuroregeneration mechanisms in mental health disorders. ORAL. • Jacka FN. Diet quality and mental health across the lifespan: updates and new directions. ORAL. • Jacka FN, Cherbuin N, Sachdev P, Anstey KJ, Butterworth P. Diet quality is associated with hippocampal volume in humans. ORAL. • Jacka F. What are the biological pathways linking diet and mental health? ORAL. • Jacka F. How to survive in research. Early Career Researcher Workshop.

Asian Association of Neuropsychopharmacology. Hong Kong December 2014.	• Berk M. "Mood disorder and inflammatory processes". KEYNOTE.

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