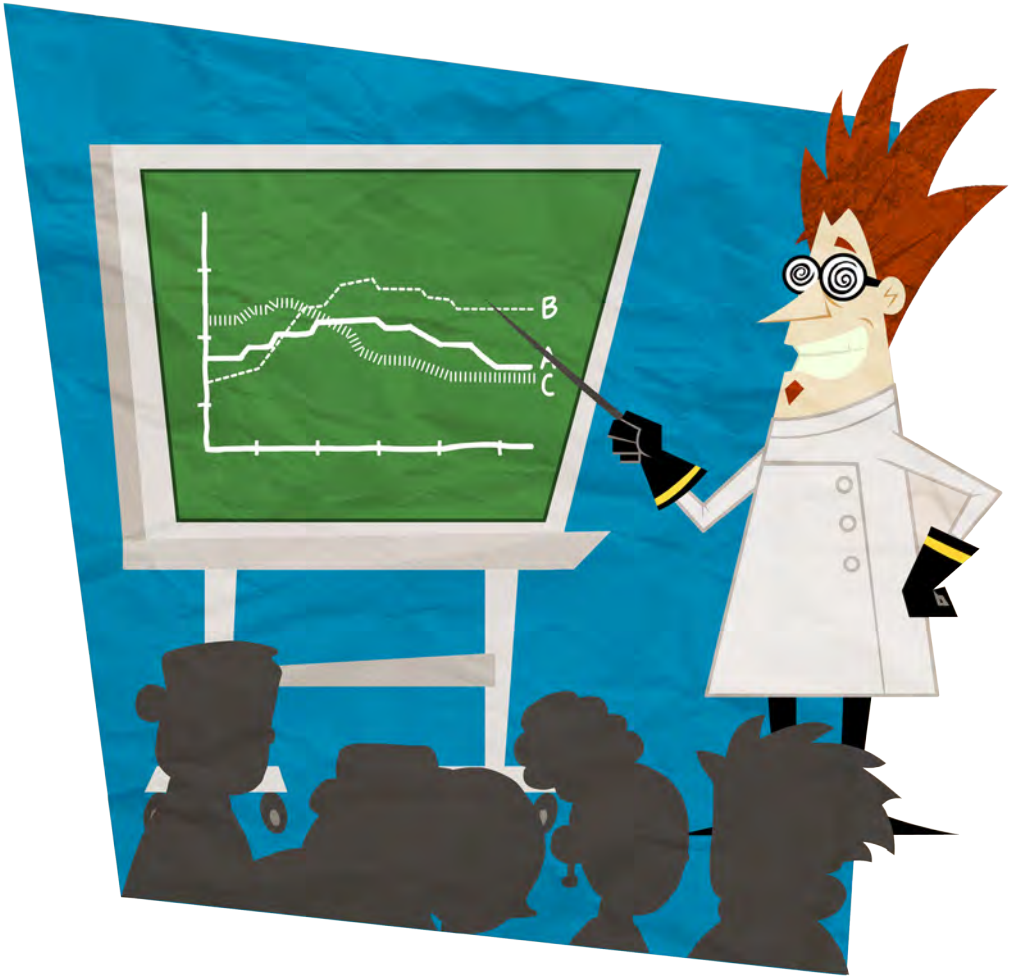
AMREP ECR CONFERENCE

26th August 2013 | AMREP Lecture Theatre



AMREP ECR Conference Committee

Dr Hao Lu (Monash CCS/Burnet)

Dr Bernadette Fitzgibbon (MAPrc)

Dr Rebecca Seagrave (MAPrc)

Dr Megan Lim (Monash SPHPM/Burnet)

Dr Renee Duncan (Burnet)

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Schedule

Time	*Session*	
8.30 - 9.00	**Registration**	
9.00 - 9.10	Welcome Address	Renee Duncan - Chair
9.10 - 9.45	Plenary Presentation	Ross Coppel - A Stratgeic Approach to Life as an ECR
9.45 - 10.30	**Session 1 - Present to your Mother**	
	Neil Bailey (Monash CCS) - Brain activity changes in depression following a traumatic brain injury	
	Timothy Colgan (Baker IDI) - Using genes to treat a severe muscle wasting disease	
	Joanne O'Toole (Monash SPHPM) - Protecting human health – determining how much water treatment is needed to make water supplies safe	
	Shanzana Khan (Baker IDI) - Y The Blood Vessels of Males Increases the Risk of Hypertension	
10.30 - 10.40	**Lab Profile**	
	Danielle Horyniak / Dhanya Nambiar (Burnet) - Alcohol and Other Drugs Research Group	
10.40 - 11.10	Morning Tea	
11.10 - 11.45	**Session 2 - Present to your Mother -** Megan Lim (Chair)	
	Anne Abbott (Monash SPHPM) - You Have the Most Power to Prevent Your Own Stroke	
	Claire Ryan (Burnet) - Sexual Health of Women in Papua New Guinea	
	Martin Pal (Baker IDI) - From Obesity to Essendon: The central role of IL-6	
11.45 - 11.55	**Lab Profile**	
	Lavinia Tran / Dhenisha Dhaya / David Morrison (Monash SPHPM) - Centre of Cardiovascular Research and Education in Therapeutics (CCRET)	

Schedule

Time	Session
11.55 - 12.45	**Data Blitz - Rebecca Seagrave (Chair)**
	Ting Ting Cao (Monash CCS) - A Near Infra-Red Study of Blood Oxygenation Changes Resulting From High and Low Frequency Repetitive Transcranial Magnetic Stimulation
	Janet Gare (Burnet) - HIV Drug Resistance in Papua New Guinea
	Kerryn Moore (Burnet) - Effect of interactions between iron deficiency and malaria on adverse birth outcomes
	Emma Gearon (Baker IDI) - Socioeconomic trends in body mass index among Australian adults
	Alyce Vella (Burnet) - Predictors of STI testing among a sample of young festival attendees in Melbourne, Australia.
	Vani Geetha (Burnet) - Distinct roles of the membrane proximal ectodomain region (MPER) of HIV-1 gp41 in cell-free and cell-to-cell virus transmission
	Brendan Elsworth (Burnet) - Characterisation of Protein Export in Malaria
	Seb Dworkin (Monash CCS) - Face Time: The genetic control of craniofacial development
	Andrew Carey (Baker IDI) - Pharmacological activation of brown adipose tissue in lean and obese humans.
	Jacqueline Flynn (Burnet) - Impaired HCV-specific IFN-gamma responses in individuals with acute HIV/HCV co-infection correlate with CD4+ T cell counts
12.50 - 2.05	Lunch / Poster Session
2.05 - 2.50	**Session 3 - Free Presentations - Hao Lu (Chair)**
	Bethany Howard (Baker IDI) - The effect of interrupting prolonged sitting with intermittent activity on markers of thrombotic risk
	Eric Tan (Monash CCS) - Do speech disturbances affect functioning and life satisfaction in schizophrenia?

Schedule

Time	Session
	William Figgett (Monash CCS) - TACI: a critical component for autoantibody production in BAFF-driven autoimmunity.
2.50 - 3.00	**Lab Profile**
	Maria Demaria / Eleanor Jones (Monash CCS) - Leucocyte Membrane Protein Laboratory
3.00 - 3.45	**Free Presentations - Bernadette Fitzgibbon (Chair)**
	Stuart Lee (Monash CCS) - Demonstrating the effectiveness of a joint police-psychiatry community crisis response unit
	Elisha Horat (Burnet) - A Critical Role for the NFκB1 Transcription Factor in the Prevention of Autoimmune Disease
	Megan Lim (Burnet) - "Let's Get WASTED!" and Other Apps: Characteristics, Acceptability and Use of Alcohol-Related Smartphone Applications
3.45 - 4.00	Closing Address and Prizes
4.00 - 6.00	Conference Mixer

Courtesy of PhD Comics / Jorge Cham©

Plenary

Ross Coppel
A Strategic Approach to Life as an ECR

Ross Coppel is a medical graduate and an internationally recognized scientist in the fields of tropical infectious diseases and primary biliary cirrhosis. He has worked within the hospital system both in Australia and overseas and as a scientist at the Walter and Eliza Hall Institute, the National Centre for Biotechnology Information at the NIH and Monash University. He is a recipient of the Glaxo Award for Advanced Research in Infectious Diseases and was a Howard Hughes Medical Institute International Fellow. He has authored or co-authored more than 450 scientific publications and has an h-index above 70. His main fields of interest are research into infectious diseases, particularly malaria and tuberculosis, autoimmunity and bioinformatics. He has represented Australia at the OECD and was appointed as an assessor to assist in the hearing of a patent case in the Federal Court of Australia. He is a Fellow of the Royal Society of Tropical Medicine and Hygiene and a member of the American and Australian Societies for Microbiology and the ASBMB. He is currently Director of Research and Senior Deputy Dean of the Faculty of Medicine, Nursing and Health Sciences at Monash University and director of the Victorian Bioinformatics Consortium as well as member of the Research Committee of the NHMRC.

Prizes

Oral Presentations
Present To Your Mother / Free Presentation / Data Blitz - Each Category will be awarded a 1st and 2nd place prize:

1st place
Award Title: Best AMREP Young Investigator Oral Presentation Award - Apple iPad mini

2nd place
Award Title: AMREP Young Investigator Oral Presentation Commendation - $200 Coles Myer voucher

Poster Presentation
1st place
Award Title: Best AMREP Young Investigator Poster Presentation Award - Apple iPad mini

2nd place
Award Title: Best AMREP Young Investigator Poster Presentation Award - Runner Up - $200 Coles Myer voucher

3rd place
Award Title: AMREP Young Investigator Poster Presentation Commendation - Gold Class Movie Double Pass

4th place
Award Title: AMREP Young Investigator Poster Presentation Commendation - Gold Class Movie Double Pass

Lab Profiles
All participants will receive chocolates and coffee vouchers

Door Prizes
1x Apple TV - MUST attend all sessions to be in the running
2 x Gold Class Movie Double Pass - Ask a speaker a question, you get a raffle ticket and you go into the draw. One person can ask as many questions throughout the day.

Abstracts

Neil Bailey - Monash CCS

Brain activity changes in depression following a traumatic brain injury

After a traumatic brain injury (TBI) depression rates are between five and ten times higher than in the general population. Although there are lifestyle changes that might contribute to this increase, it is likely brain changes also contribute.

Brain activity changes in depression following a traumatic brain injury have not yet been examined, so we cannot be sure that the treatment methods used for typical depression will have the same effect.

I used electroencephalography (EEG) to assess the difference in electrical activity between people with depression after a brain injury, and those who did not develop depression. I also compared those groups to a group with typical depression, and healthy controls.

I found that brain activity in depression following a TBI was similar to that found in typical depression. I also found that brain activity seemed to be unchanged in TBI without depression.

These results suggests that the treatments used for typical depression may be suitable for TBI depression. The lack of changes in brain activity in TBI without depression may suggest that full recovery of brain activity is possible following a mild to moderate TBI, if depression does not develop.

Abstracts

Timothy Colgan - Baker IDI

Using genes to treat a severe muscle wasting disease

Duchenne muscular dystrophy is a genetic disorder caused by mutations in a gene called dystrophin. It affects 1 in 3500 boys, resulting in muscle weakness and degeneration, and confines these boys to a wheelchair before their teenage years.
When shortened versions of the dystrophin gene were delivered to mice with dystrophy, they became stronger and lived longer, but still not as well as normal mice.
To develop a better treatment for muscular dystrophy, I have investigated other genes. I have delivered the dystrophin gene with a second gene that increases muscle strength and size, to see if this can reverse muscle degeneration and weakness.
In single muscle experiments, I have determined that sick mice are less responsive to this treatment than healthy mice. Surprisingly, the effectiveness is different when the whole body is treated.
These findings highlight a number of critical factors that will need to be considered if these therapeutic genes are to be tested in boys with muscular dystrophy, and may direct the future of clinical research for gene therapy.

Abstracts

Joanne O'Toole - Monash SPHPM

Protecting human health –determining how much water treatment is needed to make water supplies safe

Climate change, a growing population and diminishing water resources mean that as a community we must now look at using other than conventional water sources. In using alternative water sources such as recycled water derived from human sewage it is important that we carefully consider potential health impacts.

We cannot deliberately expose persons to contaminated water and then determine how much water treatment is required to make it safe. Instead we must rely on mathematical modelling techniques where we use information about the volume of water people are exposed to when they use water for different purposes to calculate the amount of water treatment required. When available accurate data are lacking, estimates are used and a conservative approach is generally taken, on the basis of protecting the public and providing a 'safety' margin. However, this can lead to higher than necessary levels of water treatment, which can discourage expansion of alternative water schemes because of the extra cost, and can also lead to unnecessary energy consumption.

I have tackled this problem by undertaking experiments to estimate the volume of water that people are exposed to when using water for domestic purposes.

My research provides new and better data for modelling microbial risk and determining water treatment requirements.

This research means that barriers to use of alternative water can be minimised, allowing for better adaptation to climate change from both a water supply and energy perspective.

Abstracts

Shanzana Khan - Baker IDI

Y The Blood Vessels of Males Increases the Risk of Hypertension

Cardiovascular disease claims the life of one Australian every 11 minutes. High blood pressure (BP), or hypertension, is the leading risk factor for the development of CVD and between the ages of 20-65, males exhibit significantly higher BP than women. Importantly, the origin of the male sex chromosome (the Y chromosome) plays an important role in controlling BP, with sons of hypertensive fathers at an increased risk of developing hypertension.

The ability of blood vessels to dilate or constrict is crucial for BP regulation. In hypertension, these processes are impaired leading to vascular dysfunction, which is more pronounced in males compared to females. We suggest that improving vascular function in males may reduce BP and critically decrease CVD mortality in males.

My lab is investigating the impact the origin of the Y chromosome has in vascular function. To achieve this aim, we replaced the Y chromosome of hypertensive rats with the Y chromosome of normotensive rats. We then dissected the blood vessels of these rats and put them in baths filled with various drugs that enable us to assess vascular function.

Insertion of the normotensive Y chromosome into the hypertensive rat dramatically decreased BP and improved the vascular dysfunction seen in hypertension.

We shed new light on the aetiology of male hypertension by suggesting the origin of the Y chromosome influences vascular function and BP control.

Abstracts

Danielle Horyniak / Dhanya Nambiar - Burnet Institute
Alcohol and Other Drugs Research Group
Professor Paul Dietze

Our group is passionate about reducing the health and social harms associated with substance use. We conduct innovative epidemiological research with populations such as people who inject drugs (PWID) and young people, covering everything from how smartphone apps can be used to promote safer alcohol consumption, to maintaining Australia's largest cohort of community-based PWID, to a field-based trial of a rapid hepatitis B vaccination schedule. Our skills include conducting field-based research, complex data analysis and data linkage.
• Young PWID are at risk of heroin overdose! We recently looked at the relationship between age and health outcomes among thousands of PWID around Australia, and found that for every five years older a participant was the likelihood of reporting a recent heroin overdose decreased by 10%, suggesting a need for targeted overdose awareness campaigns. • Despite Australia having a universal healthcare system, analysis of data from our Melbourne Injecting drug user Cohort Study (MIX) found that low income is a barrier to primary care service utilisation. This may reflect the complex needs and competing priorities facing by this population.

Abstracts

Anne Abbott - Monash SPHPM

You Have the Most Power to Prevent Your Own Stroke

Stroke is brain damage caused by impaired blood supply. Stroke is one major complication of vascular disease (the accumulation of fatty material in arterial walls) and a lead cause of death and disability in many countries, including Australia.

The carotid artery is the main path of blood to the brain. In older adults, its origin is often narrowed by 60-99% due to vascular disease without causing any symptoms. Major medical guidelines have long recommended surgery to remove the narrowing to reduce stroke risk. However, these recommendations come from 2-3 trials of surgery versus non-invasive medical treatment conducted 2-3 decades ago and probably not relevant today. Medical treatment refers to treating conditions which increase stroke risk (like smoking and high blood pressure) with a healthy lifestyle and appropriate drugs.

I did my own study of 202 patients with 60-99% symptom-free carotid narrowing given medical treatment alone and observed a stroke rate 2-3 times lower than in previous studies. I reviewed the literature for comparable high quality stroke rate calculations.

I discovered that stroke risk with medical treatment alone has fallen 80-90% over the last three decades and is now only about 0.5-1.0%/year.

Each person (including you Mum), and not a surgeon, has the most power to prevent their own stroke by adopting a healthy lifestyle and using appropriate drugs.

Abstracts

Claire Ryan - Burnet Institute

Sexual Health of Women in Papua New Guinea

Sexually transmitted infections (STIs) are a big problem in Papua New Guinea. As well as increasing the risk of getting HIV, STIs can also have negative impacts during pregnancy, resulting in pre term birth, congenital defects and spontaneous abortion. In addition, infection with human papillomavirus (HPV) increases the risk of developing cervical cancer. Many STIs do not cause symptoms for infected women.

Women in PNG have very little access to sexual health improvement programs, including screening and treatment for STIs and cervical cancer prevention programs.

We recruited women at antenatal, sexual health and well women clinics in nine sites in PNG. Women were interviewed and asked to provide vaginal and blood samples for chlamydia, gonorrhoea, trichomoniasis, syphilis, HIV, herpes and HPV testing.

At end-May 2013, a total of 872 women had been enrolled at nine participating clinics. High HPV/STI prevalences have been observed in all clinical settings. The prevalence of HPV infection was 56.1%, 27.5% and 50.6% among ANC, WWC and SHC attendees respectively. Among ANC attendees at five sites, the prevalence of HIV was 1.6%; chlamydia, 20.9%; gonorrhoea, 7.1%; trichomoniasis, 19.6%; herpes, 38.6%; and active syphilis, 4.0%.

More effective programs are needed to improve the sexual health of women in PNG. The most common STIs found in this study are easily treatable, and some are vaccine preventable. We need to work to find out how we can make these prevention and treatment options reach the women of PNG.

Abstracts

Martin Pal - Baker IDI

From Obesity to Essendon: The central role of IL-6

Obesity affects us all. We are getting bigger and bigger. This process is not just an accumulation of fat but it is also accompanied by the activation of our immune system. Pro-inflammatory molecules are produced and released from fat tissues and we are just about to understand the manifold impacts on our body...
A major pro-inflammatory molecule which has been largely attributed to obesity and its even worse end-case scenario type 2 diabetes, is Interleukin-6. IL-6 was regarded as a bad player in that process, however a leading researcher in the field Mark Febbraio could establish to have a central role in fulfilling the beneficial effects of exercise.
I used transgenic animals (mice) lacking a major component of the way IL-6 becomes activated upon exercise.
I could show the mechanism of how IL-6 becomes activated upon exercise in the contracting skeletal muscle tissue. This exercise-dependent activation of IL-6 is different from the activation observed in adipose tissue upon obesity.
This research is supporting the beneficial role of IL-6 once activated upon exercise. The known beneficial effects of IL-6 prompted Essendon FC to inject IL-6 into their players...It prompts me to further investigate the role of IL-6 once activated after exercise.

Abstracts

Lavinia Tran / Dhenisha Dahya / David Morrison - Monash SPHPM
Centre of Cardiovascular Research and Education in Therapeutics (CCRET)
Director: Prof Henry Krum, A/Director: Prof Chris Reid

The Monash Centre of Cardiovascular Research and Education (CCRE) in Therapeutics is located on Level 6 of the Alfed Centre. Our centre can be divided into 3 main areas, each showcasing its core research strengths: Clinical trials, clinical informatics, and pharmacoepidemiology/translation research. Clinical Trials: Conducted at the Clinical Pharmacology Centre (Alfred Hospital) and the Clinical Trials Centre at Caulfield Hospital. Clinical Informatics and Data Management Unit (CIDMU) provides key platform technologies for the conduct of epidemiological, clinical trial and health services research. Our centre offers software development, clinical registry management, and data analyses. Some current projects within CIDMU include: • The Australian Society of Cardiac and Thoracic Surgeons (ANZSCTS) National Cardiac Database Program. This program systematically collects data from participating sites and produces reports based on key performing indicators annually. It is also a quality assurance registry that monitors performance at unit and surgeon level. • Melbourne Intervention Group (MIG) focuses on percutaneous coronary interventions in Victorian hospital • The Australian Rheumatology Association Database (ARAD) focuses on monitoring the benefits and safety of new treatment. Pharmacoepidemiological/Translation Research: • Epidemiological modelling: Development of risk prediction models (e.g AusScore), cost-effectiveness modelling, outcomes prediction modelling. Our research has been recognised nationally and internationally through many publications and numerous invitations to present at local and international cardiovascular meetings.
ANZSCTS National Cardiac Surgery Database Program has successfully monitored the cardiac surgical performance of Australian hospitals. Australian hospitals have consistently performed on par or better than other international averages (eg UK and USA). Additionally, using the data from the the database, we have found key patient risk factors that influence patient outcomes and have developed models to predict the risk of 30-day mortality post cardiac surgery.

Abstracts

Ting Ting Cao - Monash CCS

A Near Infra-Red Study of Blood Oxygenation Changes Resulting From High and Low Frequency Repetitive Transcranial Magnetic Stimulation

High and low frequency repetitive transcranial magnetic stimulation (rTMS) are both used to treat major depressive disorder(MDD). However, the physiological mechanisms underlying the therapeutic benefit and the effect of the stimulation frequency are unclear.
Twelve healthy participants received 1Hz, 2Hz, and 5Hz active rTMS. Twenty 5 second trains were delivered at left dorsolateral prefrontal cortex at 110% of resting motor threshold with a 25 second inter-train interval.
Blood oxygenation (HbO) was significantly reduced following the 1Hz trains compared to the HbO increases observed in both the 2Hz and 5Hz conditions. There was no significant inter-hemispheric difference in response.
These results suggest that short trains of high and low frequency rTMS delivered to prefrontal cortex evoke a differential HbO response and provide additional evidence that high frequency trains result in increased neural activity. The findings may provide further explanation for the improved symptoms observed in MDD patients treated with high frequency rTMS.

Abstracts

Janet Gare - Burnet Institute

HIV Drug Resistance in Papua New Guinea

As ART programs expand in Papua New Guinea (PNG), the emergence of drug resistance becomes an issue. This study examined the levels of transmitted drug resistance (TDR) among ART-naïve and acquired drug resistance (ADR) among ART-experienced people living with HIV (PLHIV) in PNG.

209 PLHIV were recruited from ART clinics in two provinces using convenient sampling. A questionnaire was administered to capture demographic information including ART histories. Blood was collected for HIVDR testing, viral load testing, and HIV subtyping.

61% were female whilst 51% were ART-naïve. 86% of samples from ART-naïve PLHIV were successfully genotyped of which 1.1 % had evidence of TDR. 18 of ART-experienced PLHIV had detectable VL (>220 RNA copies/ml) and were successfully genotyped. 6/18 (33%) had ADR and reported non-adherence to ART.

There is evidence of HIVDR in PNG. Continued education on treatment adherence and monitoring of DR remain essential to minimize HIVDR in PNG.

Abstracts

Kerryn Moore - Burnet Institute

Effect of interactions between iron deficiency and malaria on adverse birth outcomes.

WHO recommends antenatal iron supplementation to improve birth outcomes. However, iron supplementation can increase malaria risk, and iron deficiency protects against malaria. How iron deficiency and malaria interact to influence birthweight is unknown.
We determined malariametric and iron deficiency parameters in 470 pregnant women in a malaria-endemic region of Papua New Guinea and followed them until delivery.
Prevalence of iron deficiency was high (87%). Primigravidae with iron deficiency had babies that were on average 284 grams heavier ($p = 0.006$) than babies or iron replete primigravidae, but there was no association in multigravidae ($p = 0.984$). Iron deficiency reduced odds of low birthweight (OR = 0.55, $p = 0.173$).
Iron deficient women had heavier babies than iron replete women in a malaria-endemic area. Results question the use of antenatal iron supplementation to improve birth outcomes in malaria-endemic regions.

Abstracts

Emma Gearon - Baker IDI

Socioeconomic trends in body mass index among Australian adults

Obesity is socially patterned such that those of a lower socioeconomic position (SEP) have a higher rates of obesity than their higher SEP counterparts. Between 1980 and 2000, the prevalence of obesity in Australians doubled to around 20%. We aimed to quantify trends in obesity according to socioeconomic position (SEP) among men and women from 1980 to 2007.

We compared data from urban Australian adults in the 1980, 1983 and 1989 National Heart Foundation Risk Factor Prevalence Survey (RFPS), the 1995 National Nutrition Survey (NNS), the 2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab), and the 2007 National Health Survey (NHS).

The age standardised prevalence of obesity increased from 12% to 31% and 10% to 21% between 1980 and 2007 for low and high SEP men, respectively. For women, obesity prevalence increased from 12% to 28% and 7% to 18% for low and high SEP groups, respectively.

Inequalities in BMI have persisted in the Australian adult population since 1980 with no signs of improvements, and a possible worsening in recent years. It is essential that interventions to address the increasing trend of obesity have the dual goal of improving population levels of weight and reducing its associated disparities.

Abstracts

Alyce Vella - Burnet Institute

Predictors of STI testing among a sample of young festival attendees in Melbourne, Australia.

Young people represent one of the most at-risk population groups for sexually transmitted infections (STIs). General practice is an ideal setting to prompt STI testing, which remains low among young people.
We surveyed young people aged 16-25 years at a Melbourne festival in 2013. Logistic regression was used to determine predictors of an STI test in the past 12 months among sexually-active participants who reported visiting their GP < 12 months ago.
Predictors of a recent STI test included reporting > 10 lifetime partners (OR 3.7, 95%CI 2.2-6.2), being aged 20-25 (OR 1.9, 95%CI 1.2-2.9), inconsistent condom use with a regular partner (OR 1.6, 95%CI 1.0-2.5) and using the contraceptive pill at last sex (OR 1.8, 95%CI 1.2-2.8).
Promoting STI testing and sexual health discussions (contraception, condom negotiation) among sexually active young people through GP networks is very important.

Abstracts

Vani Geetha - Burnet Institute

Distinct roles of the membrane proximal ectodomain region (MPER) of HIV-1 gp41 in cell-free and cell-to-cell virus transmission.

The membrane proximal ectodomain region (MPER) of HIV-1 gp41 is a highly conserved determinant that is crucial for membrane fusion and is a target for broadly neutralising antibodies.
In this study we compared the function of the MPER in cell-free versus cell-to-cell virus infection and spread. W666A and I675A MPER mutations diminished cell-free pseudovirion entry into U87.CD4.CCR5 cells by ~ 100-fold and blocked the ability of cell free virus to initiate spreading infection in U87.CD4.CCR5 cells. The cell-free MPER mutants also showed reduced infectivity in JLTRG-R5 T cell reporter cell-line. In contrast to cell-free virus, spreading infection was observed for W666A and I675A when cultures were initiated with cell-associated virus. Further, L8S/S9R mutations in the MA region of Gag that block Env incorporation into virions, also blocked cell free and cell-cell viral spread. This result confirms that the cell-to-cell viral transmission observed with the MPER mutants is mediated by a completely assembled virus and is not simply due to cell-cell fusion.
Our data reveal separable functions for the MPER in cell-free versus cell-associated virus infectivity. Our data imply that the mechanism of neutralization by MPER-directed antibodies may be different for cell-free versus cell-cell transmitted virus which has implications for HIV-1 vaccine design.

Abstracts

Brendan Elsworth - Burnet Institute

Characterisation of Protein Export in Malaria

The disease we know as malaria is caused when a parasite invades human RBCs. When the parasite invades RBCs it exports a large number of proteins into the RBC which enable it to survive. How it exports these proteins is poorly understood and represents a new drug target. We are therefore studying a group of proteins involved in the export process.
We are using a genetic approach, including novel gene knock-down methods, to try and generate parasites that lack the ability to export proteins to the RBC.
We are able to efficiently and inducibly reduce the amount of a protein involved in protein export within the parasites. This leads to the rapid death of parasites and we are currently investigating the specific effect on protein export.
We have shown the importance of a group of proteins in malaria parasites and validated them as novel drug targets in the future.

Abstracts

Seb Dworkin - Monash CCS

"Face Time: The genetic control of craniofacial development"

Understanding how the head and facial skeleton form in lower organisms is an excellent predictive resource for identifying the genes which control human craniofacial development, and by extension can provide insights into the aetiologies of common in utero craniofacial defects. Work from our group, and others, has identified that the Grainy head-like (Grhl) transcription factors are highly conserved regulators of facial formation. By using the zebrafish as our developmental model, we sought to identify the mechanisms by which the Grhl-family regulates craniofacial skeleton formation.

Zebrafish embryos (at the 1-2 cell stage) were injected with specific anti-sense oligonucleotides to knock down the gene function of Grhl family member grhl3. Subsequent experiments looked at the morphological and genetic changes caused by loss of grhl3 in the context of craniofacial development.

Our data show that grhl3 lies upstream of a highly conserved signalling pathway, regulated by endothelin-1 (edn1), which is critical for craniofacial development. Our work confirms that edn1 is a direct target gene of grhl3, and that the defective facial cartilage formation in grhl3-knockdown embryos can be rescued by endothelin-1 mRNA.

Our study has identified a novel genetic pathway by which the craniofacial skeleton forms. Our future studies are aimed at understanding this pathway, and others regulated by the Grhl family, in the more complex development of the facial skeleton in mouse and humans.

Abstracts

Andrew Carey - Baker IDI

Pharmacological activation of brown adipose tissue in lean and obese humans

Brown adipose tissue (BAT) activation increases energy consumption and may have therapeutic potential to combat obesity. Cold exposure is the main physiological stimulus for BAT thermogenesis (energy burning) and the sympathetic nervous system, which innervates BAT, is essential in this process. However cold-induced BAT activation is impaired in obese humans. To explore therapeutic potential it is essential to determine whether pharmacological agents can activate (increase energy consumption) BAT.

We aimed to determine whether BAT can be activated in lean and obese humans after acute administration of an orally bioavailable sympathomimetic. Nine lean (BMI, 22±1 kg/m2) and nine obese (BMI, 36±1 kg/m2) young men were administered 2.5 mg/kg of oral ephedrine, and on a separate day, a placebo, in a randomised, double-blinded, crossover trial. BAT activity was assessed by measuring glucose uptake with 18F-fluorodeoxyglucose (FDG) via positron emission tomography-computed tomography (PET-CT) imaging.

BAT activity was increased by Ephedrine compared with Placebo in Lean but unchanged in Obese. The change in BAT activity after Ephedrine compared to Placebo was negatively correlated with various indices of body fatness.

We demonstrate for the first time that BAT can be activated via acute, oral administration of a pharmacological agent in young lean adult male humans, but that, like cold exposure, this is impaired in obesity.

Abstracts

Jacqueline Flynn - Burnet Institute

Impaired HCV-specific IFN-gamma responses in individuals with acute HIV/HCV co-infection correlate with CD4+ T cell counts

HIV/HCV co-infection has detrimental effects on HCV disease progression including increased cirrhosis and hepatocellular carcinoma. Few studies have assessed the effect of co-infection on HCV-specific T cells in acute HCV/HIV and fewer compared to HCV mono-infection.
In a cohort of 20 acute HIV/HCV co-infected and 20 HCV mono-infected subjects we compared HCV-specific T cell responses and cytokine profiles.
HIV/HCV co-infection reduced HCV-specific cytokine production, particularly IFN-gamma (p500 cells/mm3), suggesting possible impairment in CD4+ T-cell function.
This is the first demonstration of a positive correlation between HCV-specific IFN-gamma production and CD4+ T-cell counts in acute HIV/HCV co-infection. It highlights the importance of functional HCV-specific T cells early in infection and is important for timing treatment aimed at HCV clearance.

Abstracts

Bethany Howard - Baker IDI

The effect of interrupting prolonged sitting with intermittent activity on markers of thrombotic risk

Excessive sitting has been associated with an elevated risk of vascular conditions, particularly venous thrombosis. Interrupting sitting time with intermittent physical activity can reduce venous stasis; however, impacts on other aspects of thrombogenesis are less understood.
We examined the effects of interrupting sitting time on blood coagulation and blood volume parameters in sedentary, middle-aged, overweight/obese adults (11 men/8 women; 53.8 ± 4.9yrs, BMI: 31.2 ± 4.1 kg.m-2). The randomized three-period, three-treatment acute crossover trial consisted of: uninterrupted sitting; sitting interrupted by 2 min bouts of either light- or moderate-intensity treadmill walking every 20min. In each trial-condition, blood samples were collected at baseline prior to the consumption of a standardized meal (-2hrs) and post-intervention (5hrs).
Compared to uninterrupted sitting, fibrinogen was lower (0.17g.l-1 [0.01, 0.32]) in the sitting with the light-intensity activity condition, but not the moderate-intensity activity condition. Both activity conditions resulted in small reductions in thrombin clotting time relative to uninterrupted sitting. There were no significant between-condition differences in prothrombin time, activated partial thromboplastin time, von Willebrand factor and D-dimer. Uninterrupted sitting reduced plasma volume and increased hematocrit, hemoglobin and red-cell count; effects attenuated by both light- and moderate-intensity breaks (P
Uninterrupted sitting increased fibrinogen and reduced plasma volume, with associated increases in hemoglobin and hematocrit. Activity breaks attenuated these responses, indicative of an ameliorating influence on the pro-coagulant effects of uninterrupted sitting.

Abstracts

Eric Tan - Monash CCS

Do speech disturbances affect functioning and life satisfaction in schizophrenia?

This study examined the relationship between thought disorder (TD) symptoms and objective and subjective quality of life (QoL) in schizophrenia (Sz). Previous research has yet to establish such a link, though it seems intuitive given that TD is related to cognitive dysfunction which does influence Sz QoL. We aimed to more thoroughly examine the relationship between TD and QoL by (1) looking at functioning and satisfaction elements concurrently, and (2) controlling for the influence of neurocognition and insight.

54 patients with schizophrenia/schizoaffective disorder were administered a general neurocognitive battery, clinical assessment for thought disorder and depression, and a quality of life interview.

Two stepwise regressions were run with objective QoL and subjective QoL as individual DVs. Negative TD significantly predicted objective QoL scores, $\beta=-.40, t(53)=-3.05, p$

There does appear to be a differential relationship between TD and QoL. Lack of verbal spontaneity (negative TD) seems to affect daily functioning and relations with others, while poor speech regulation (positive TD) may affect patient views of personal satisfaction. The impact of negative TD on QoL suggests it to be a more important target for intervention than positive TD.

Abstracts

William Figgett - Monash CCS

TACI: a critical component for autoantibody production in BAFF-driven autoimmunity.

BAFF is required as a B cell survival factor, but excessive amounts lead to autoimmune disease in a subset of human SLE patients and has been demonstrated in mice with excess BAFF (BAFF Tg mice). This disease involves inappropriately high levels of B cell survival and the production of autoantibody isotypes capable of complement-fixing. It was unclear which receptors for BAFF are required for disease progression, although it was previously shown that the TLR signalling adaptor MyD88 was required. Given that TACI (one of the receptors for BAFF) can signal directly through MyD88, upregulates expression of nucleic-acid sensing TLRs, and can promote antibody class switching, we examined the extent to which TACI contributes to BAFF-driven autoimmune progression.
BAFF Tg chimera mice were generated using bone marrow from WT or TACI-deficient donors, and disease severity was monitored to test whether TACI expression on B cells is necessary for disease progression driven by excess BAFF. Specific autoantibody isotypes of anti-dsDNA, and rheumatoid factors, were measured by ELISA and fluorescence microscopy.
The absence of TACI expression on B cells in chimera mice protected them from the production of pathogenic autoantibody isotypes and organ damage.
These findings reveal that TACI plays a critical role in the progression of BAFF-driven autoimmunity, and provide new directions for therapeutic intervention.

Abstracts

Maria Demaria and Eleanor Jones - Monash CCS
Leucocyte Membrane Protein Laboratory
Associate Professor Mark Wright

The Leucocyte Membrane Protein Laboratory is situated in the Monash Department of Immunology. We are interested in a family of integral membrane proteins called the tetraspanins. Tetraspanins function in a number of processes including cell adhesion, migration and signal transduction, through the formation of tetraspanin enriched microdomains (TEMs), which organize the cell surface. Our lab studies these proteins through the generation of knockout mice and investigating the effects of tetraspanin deficiency on the immune system. We have expertise in a wide range of immunological techniques including in vitro and in vivo antigen presentation, migration and homing assays, flow cytometry, intravital (in collaboration with Michael Hickey) and confocal microscopy.

We have two novel tetraspanin deficient mouse strains: the CD82-/- and CD53-/-. CD82 is a ubiquitously expressed tetraspanin which is known to suppress metastasis. CD53, however is leucocyte specific, and has only been studied in vitro. Both of these mice have striking phenotypes. CD82-/- dendritic cells (DC) are hypostimulatory to antigen-specific T cells and migrate exceptionally both in vitro and in vivo. The morphology of these DC is distinct from wild-type and they are unable to form stable conjugates with T cells during antigen presentation. Peripheral lymph nodes from CD53-/- mice display a markedly decreased cellularity with 85% less B cells when compared to wild-type. CD53 is essential for the expression of L-selectin, an adhesion molecule important in lymphocyte homing, on B cells but not T cells.

Abstracts

Stuart Lee - Monash CCS

Demonstrating the effectiveness of a joint police-psychiatry community crisis response unit

Crisis situations that occur in the community because of acute psychiatric symptoms can result in the person or others being at risk of harm. Police often respond first despite having little training in managing people with a mental illness. Crisis mental health clinicians can give a community response but are far less available. This can result in delays accessing help or unnecessary criminal charges. Alfred psychiatry and Victoria Police established a joint unit to improve how crisis responses occur. This study evaluated outcomes for the unit.

An audit occurred of the activity database maintained by the unit Officer in Charge collecting the reason for and outcomes of contacts. Police members and crisis mental health clinicians also completed a questionnaire exploring their experience of the unit.

During a 6-month trial, 296 contacts were received mostly for threatened suicide, welfare concerns or psychotic episodes. Most contacts (51%) were managed in the community through onsite intervention or referring people to services (e.g. housing, addiction) to address the crisis cause. Transport to the inpatient psychiatry ward occurred for 11%, ensuring rapid access to mental health care. Eleven mental health clinicians and 66 police completed questionnaires. Police in particular highly valued the unit. Multiple benefits were reported: more efficient use of police resources, improved capacity for police to respond to mental illness, improved collaboration between services and improved quality of mental health crisis responses.

A joint police-psychiatry response unit may provide an effective approach to managing community-based mental health crises.

Abstracts

Elisha Horat - Burnet Institute

A Critical Role for the NFκB1 Transcription Factor in the Prevention of Autoimmune Disease

Regulatory proteins known as transcription factors have the unique ability to control the expression of our genes. This study focused on a transcription factor called NFκB1, which is important in controlling many of the genes required for normal functioning of the immune system. Evidence exists that deregulation of NFκB1 function can lead to the development of cancer, however it's precise roles in immune cells remain unclear. This study describes the novel finding that the absence of NFκB1 in mice leads to the development of a severe immune-mediated disease, with classic features of Autoimmunity.

Using the bone marrow chimera mouse model, in which lethally irradiated wild-type mice are transplanted with NFkB1-deficient haematopoietic cells, it was found that virtually 100% of these mice developed severe multi-organ disease.

Hallmark features of Autoimmune disease were observed, including the development of hyper-IgM and Autoantibodies, as well as the expansion and infiltration of B-lymphocytes within multiple organs. Autoantibodies showed specificity for the exocrine acinar cells in the pancreas, with a prominent infiltration of B-lymphocytes leading in severe cases to complete destruction of the exocrine pancreas.

These findings indicate that NFκB1 plays a crucial role in maintaining balance within the immune system, and prevents the development of Autoimmune disease. As therapeutic inhibitors of NFκB signalling are rapidly becoming a clinical reality, this role for NFκB1 may have significant implications, and suggests a potential drawback for targeting NFκB1 therapeutically.

Abstracts

Megan Lim - Burnet Institute

"Let's Get WASTED!" and Other Apps: Characteristics, Acceptability and Use of Alcohol-Related Smartphone Applications

Smartphone apps offer a number of possibilities for health promotion activities, young people may also be exposed to apps with incorrect or poor quality information. Little is known about the quality of alcohol-related apps or what influence they may have on young people's behaviour. The purpose of the current study is to critically review the most popular alcohol-related smartphone applications and to explore young people's opinions of these apps.
A two-phased mixed methods approach was used. The first phase involved a critical content analysis of 500 smartphone apps available via Apple iTunes and Android Google Play stores. Subsequently all available blood alcohol concentration (BAC) apps were tested using four profiles from a previous study. The second phase involved two focus group discussions to explore how young people engage and use alcohol-related apps, and specifically BAC apps.
384 apps were included; 50% (192) were entertainment apps, 39% (148) were BAC apps and 11% (44) were health promotion and/or stop drinking related apps. When testing the BAC apps there was a very wide variation in results (e.g., for Profile One, BAC estimates ranged between 0.001 and 0.91). Participants were sceptical of the accuracy of BAC apps, and there was an overall concern that these apps would be used as a form of entertainment, further encouraging young people to drink on a night out, rather than reduce their drinking and risk taking.
Peak health bodies need to endorse evidence-based alcohol smartphone apps to give specific apps credibility in the ever expanding market of unregulated apps. Apps developed by health professionals need to be innovative, useful, desirable, and fun, in order to compete with apps encouraging unhealthy behaviours.

Posters

1 Ryan Kaplan - It's beginning to look a lot like my hand! Fake hand perceived to resemble own hand for people with body dysmorphic disorder but not controls

2 Paddy Dempsey - Breaking up prolonged sitting: a practical and therapeutic tool in the management of Type 2 Diabetes?

3 Tamsyn Van Rheenen - An Empirical Evaluation of the Matrics Consensus Cognitive Battery in Bipolar Disorder

4 Carol Hodgson - Early activity and mobilisation to improve outcomes in survivors of critical illness

5 Huachun Zou - High risk sexual behaviours and sexually transmitted infections among teenage men who have sex with men

6 Sara Holton - Childbearing and women with a chronic non-communicable health condition: identifying concerns and information needs for informed decision-making and optimal health-care

7 Allan Wiseman - A longitudinal study of television viewing time and adiposity amongst postmenopausal women

8 Danielle Horyniak - "We don't like each other no more, coz they're using that stupid drugs": Attitudes to injecting drug use among marginalised African youth

9 Cameron Johnson - Reducing sitting time in office workers: preliminary findings from the Stand Up Victoria study

10 Kate Cantwell - Circadian trends in Ambulance Demand

11 Catherine Chamberlain - Diabetes in pregnancy among Aboriginal and Torres Strait Islander women: a major health disparity

Posters

12 Maria Demaria - The tetraspanin CD53 regulates L-selectin expression, lymphocyte homing and inflammation

13 David Grubb - Phospholipase C beta1b delivery by adeno-associated virus results in atrial dilatation and loss of ventricular function

14 Eleanor James - Tetraspanin CD82 plays a vital role in antigen presentation and processing in dendritic cells, and influences migration in opposition to CD37

15 Yi (Gillian) Ma - Phospholipases Cβ1b over-expression in neonatal ventricular rat cardiomyocytes results in reduced Sarcoplasmic reticulum Ca2+ content and Ca2+ leak from Ryanodine receptors

16 Angus Banh - Influence of macrophage migration inhibitory factor (MIF) on apoptosis and fibrogenesis in cardiac cells under hypertrophic stimulation

17 Sarah Heywood - HDL Modulates Glucose Metabolism in Cardiomyocytes

18 Shan Liu - Subtotal nephrectomy accelerates pathological cardiac remodeling post-myocardial infarction: Implications for cardiorenal syndrome

19 Imala Alwis - Platelet thrombi utilize co-operative biochemical and biophysical mechanisms to induce excessive leukocyte accumulation to sites of endothelial injury

20 Tamara Allen - IC7, an IL6-CNTF chimera, improvesobesity induced glucose intolerance

21 Caroline Andersson - Transcriptional effects of the dietary histone deacetylase inhibitor L-sulforaphane – insights from mRNA-Seq

22 Lachlan Gray - HIV-1 entry and trans-infection in astrocytes: implications for cure and eradication

Posters

23 Katherine Ververis - Protection from radiation-induced DNA damage by hydroxytyrosol and Olivamine

24 Stephanie Torterella - Incorporation of DNA minor groove binding bibenzimidazoles into poly-DL-lactic co-glycolic acid nanoparticles

25 Nicola Cooley - No contribution of IP3-R(2) to disease phenotype in models of dilated cardiomyopathy or pressure overload hypertrophy

26 Tom Karagiannis - Hydroxytyrosol induces DNA damage and cell-death in malignant K562 cells

27 Erith Nash - Epigenetic effects of probiotic metabolites and dietary histone deacetylase inhibitors in malignancies

28 Jane Jisung Sung - The effect of an anti-cancer phototherapy, UVASens in malignant cells

29 Maverick Lau - Increased Lyn Activity Perturb Type II Epithelial Cells Proportion Leading to Emphysema and Increase Propensity of Lung Cancer in Mice

30 Nadia Mazarakis - An atlas of histone deacetylase expression in the laboratory mouse

31 Jane Sung - The expression of histone deacetylases in malignant leukaemic and normal blood cells

32 Hamid Salimi - A common mechanism of clinical HIV-1 resistance to the CCR5 antagonist maraviroc despite divergent resistance levels and lack of common gp120 resistance mutations

Session Prize

Name:

Lab / Institute:

Ph. No:

Session 1

Session 2

Session 3

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