Joint Centre for Ageing, Cognition, and Wellbeing (CACW) and BioNet Conference

Day 2
Wednesday 1
December
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-9:15</td>
<td>Official Welcome</td>
<td></td>
</tr>
<tr>
<td>9:15-10:15</td>
<td>TBC</td>
<td>Professor Lars Ittner</td>
</tr>
<tr>
<td>10:15-10:30</td>
<td>Prevalence of ageing-related tau astrogliopathy in a community-based ageing cohort</td>
<td>Dr Shelley Forrest</td>
</tr>
<tr>
<td>10:35-10:55</td>
<td>BREAK</td>
<td></td>
</tr>
<tr>
<td>10:55-11:10</td>
<td>INTERVENTIONS TO IMPROVE SOCIAL CONNECTIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS</td>
<td>Dr Dino Zagic</td>
</tr>
<tr>
<td>11:15-11:30</td>
<td>Semantic fluency and its associated brain activity in Parkinson’s disease with Mild Cognitive Impairment</td>
<td>Dr Ji Hyun Julia Yang</td>
</tr>
<tr>
<td>11:30-11:45</td>
<td>Therapy to Reduce dementia risk In Parkinson’s disease (TRIP): Proof-of-concept trial</td>
<td>Dana Pourzinal</td>
</tr>
<tr>
<td>11:45-12:00</td>
<td>Elecsys automated immunoassay to supporting the diagnosis of Alzheimer’s disease in Australia</td>
<td>Dr Qiao-Xin Li</td>
</tr>
<tr>
<td>12:00-12:15</td>
<td>Building a Modular Protein Nanoparticle Platform for Active Immunotherapy Against Alzheimer’s Disease</td>
<td>India Boyton</td>
</tr>
<tr>
<td>12:25-12:55</td>
<td>BREAK</td>
<td></td>
</tr>
<tr>
<td>12:55-13:55</td>
<td>Nutrient Intake and Its Effects on Health Outcomes in Older Australian Men</td>
<td>Associate Professor Vasant Hirani</td>
</tr>
<tr>
<td>13:55-14:15</td>
<td>The role of financial literacy when paying for aged care</td>
<td>Professor Henry Culter</td>
</tr>
<tr>
<td>14:15-14:35</td>
<td>Managing COVID-19 research related challenges at Macquarie University: reactive vs proactive approach.</td>
<td>Dr Yordanka Krastev</td>
</tr>
<tr>
<td>14:35-14:50</td>
<td>Motif-Specific Anti-PrPC Antibodies Induce Neuronal Hypersensitivity</td>
<td>Utpal Kumar Adhikar</td>
</tr>
<tr>
<td>14:50-15:00</td>
<td>Farewell, Prizes and Close</td>
<td>Sakkie Pretorius</td>
</tr>
</tbody>
</table>
Overview

The CACW centre’s of multidisciplinary researchers and the BioNet Group focused on clinical practice and translation are joining together to present this year’s conference themes of Dementia Risk Reduction and Social and Emotional Wellbeing of Older Adults.

The Centre for Ageing, Cognition, and Wellbeing at Macquarie University is a collaborative group of multidisciplinary researchers with interest in the normal and abnormal aspects of ageing. This includes research related to understanding and improving wellbeing related to neurodegenerative diseases, mental disorders, and health related conditions in the community and residential aged care. In addition, we are interested in understanding the normal impacts of ageing on cognition, reading, emotion regulation, social connections and workforce participation (retirement). We are also interested in studying how cognitive support systems (e.g. engaging in skilled activities with others) may benefit older adults. We have close connections with researchers across Macquarie University and collaborate broadly with psychology, cognitive science, medicine, audiology, physiotherapy and business, to name a few.

We use a wide range of research methods including clinical trials, psychometric methods, neuropsychological testing, eye movement analysis, psychophysiological measurement, questionnaire and survey research, interview and focus group research methods.

BioNetwork's mission is to expand the links between research and clinical medicine specialties, with a special interest in Macquarie University’s health priorities. In line with this mission it is well-timed to be during the decade 2020-2030 identified as the ‘decade of healthy aging’. This year, BioNetwork 2021’s aim is to provide opportunities for sharing knowledge in the Aging research field and promote research programs with strong relevance to practice and to age gracefully, while ensuring the wellbeing of individuals. BioNetwork 2021 welcomes collaboration with Macquarie University’s Centre of Aging, Cognition and Wellbeing to leverage the importance of this year’s theme of biological aging and wellbeing. We aim to further stimulate interaction and strengthen existing long-term collaboration between different departments at Macquarie University and identify novel national and international prospects for collaboration.
Conference Organising Committee
Professor Viviana Wuthrich
A/Prof Piers Dawes
Dr Paul Strutt
HDR Heidi Hillebrandt
HDR Gabi Picard
Dr Nino Kordzakhia

Themes

Dementia Risk Reduction

Social and Emotional Wellbeing of Older Adults
Keynote Speaker Biographies

**Associate Professor Vasant Hirani**

Vasant Hirani is an Associate Professor at the School of Life and Environmental Sciences, University of Sydney. She is a qualified Dietitian, APD, Nutritional Epidemiologist and Public Health Nutritionist, with a PhD in Nutritional Epidemiology. Her research interests are in the area of Ageing research.

**Professor Lars Ittner**

Professor Lars Ittner is the Director of the Dementia Research Centre and Professor in the Department of Biomedical Sciences of the Faculty of Medicine, Health and Human Sciences at Macquarie University. Lars graduated from the University of Ulm in Germany and completed his thesis at the University of Zurich in Switzerland in 2002. This was followed by postdoctoral fellowships at the University of Zurich, where he studied neuronal stem cells and signalling pathways, and after moving to Australia in 2005, at the University of Sydney, focusing on basic pathomechanisms underlying neurodegenerative diseases. He became an independent group leader and Associate Professor at the University of Sydney in 2011, followed by an appointment to the University of New South Wales in 2013, where he became a Professor and headed the Dementia Research Unit and Transgenic Animal Unit in the Faculty of Medicine. In 2018 he joined Macquarie University to build the Dementia Research Centre. Lars was a German Research Foundation Fellow, a NHMRC Senior Research Fellow and is a current NHMRC Principal Research Fellow.

**Professor Henry Cutler**

Professor Cutler is the inaugural Director of Macquarie University’s Centre for the Health Economy, a health economics research team with 15 professional health economists and six PhD students. His career is focused on enhancing health and aged care policy decisions to improve social welfare. He has led or significantly contributed to over 140 health economic research projects funded by Australian and state governments, multinational health care organisations, large not-for-profit organisations and competitive academic grants.
Professor Cutler currently sits on the National Mental Health Commission’s National Workplace Initiative Evaluation Group. He was an expert witness for the Royal Commission into Aged Care Quality and Safety and sat on the economic research committee for the Royal Commission into Victoria’s mental health system.

Prior to MUCHE, Professor Cutler built and led the health economics team at KPMG, and built and led the Sydney Health Economics and Social Policy team at Access Economics. Here, Professor Cutler led over 20 consultancy projects on aged care and dementia, including with the Department of Health, Aged Care Financing Authority, Dementia Australia, several aged care providers, and aged care peak bodies.
Presentation abstracts

1  
**TBC**

*Professor Lars Ittner, Department of Biomedical Sciences, Macquarie University*

2  
**Prevalence of ageing-related tau astrogliopathy in a community-based ageing cohort**  
*Dr Shelley Forrest, Department of Biomedical Sciences, Macquarie University*

Age-related pathologies are increasingly found in the brains of elderly individuals and are observed in a range of neurodegenerative disorders. Whether they lower an individual’s threshold for developing a neurodegenerative disorder, how they relate to clinical phenotype, neuropathological changes, and disease progression is the focus of current research. Ageing-related tau astrogliopathy (ARTAG) is a recently described age-related pathology associated with accumulation of the tau protein in astrocytes. It is characterised by thorn-shaped astrocytes and granular fuzzy astrocytes, with different ARTAG types recognised. Determining the prevalence of ARTAG is often complicated by selection bias in autopsy series and little is known about its true prevalence in unselected populations. This study determined the prevalence of cortical ARTAG in a European community-based population (n=310). Cases ranged from 76-91 years of age (83±3 years) and comprised 181 females. The frontal, parietal, and temporal cortices were assessed. ARTAG was identified in 117 cases (38%), with a similar regional prevalence. Grey matter ARTAG was the most common followed by subpial, white matter, and perivascular. The presence of any type of ARTAG was strongly associated with having another type of ARTAG in the same region (p < 0.05). In addition, this study provides reference data on the frequency of cortical tau-pathologies (<1%-47%) observed in the ageing brain, with neurofibrillary tangles in the temporal cortex found in 47% of cases. This study shows that cortical ARTAG in this population is common and careful consideration is required to differentiate astrocytic inclusions in ARTAG from those in other tau-depositing disorders.

3  
**INTERVENTIONS TO IMPROVE SOCIAL CONNECTIONS: A SYSTEMATIC REVIEW AND META-ANALYSIS.**  
*Dino Zagic, PHD Student, Department of Psychological Sciences, Macquarie University*

Introduction/Background:
The importance of both frequent and high-quality social connections for psychological wellbeing is widely recognised. Previous reviews of interventions for promoting social connections found mixed results due to the inclusion of uncontrolled studies and merging of objective and subjective dimensions of social connections. We conducted a systematic review and meta-analysis of controlled trials to tease apart the effectiveness of interventions designed to promote ‘objective social contact’ and the ‘quality of social connections’; we also compared the effectiveness of interventions from different theoretical orientations on these social dimensions.
Methods:
A systematic search of the electronic databases Medline, Embase, PsycINFO and PubMed was conducted to identify randomised controlled trials of interventions for social isolation, loneliness, social participation and/or social connectedness in adults. Data were analysed using Stata V.16.0.

Results:
A total of 58 studies met inclusion criteria (Mean Age = 62-years). Overall, interventions led to significant improvements in objective social contact (Hedges’ g = 0.43) and the perceived quality of social connections (Hedges’ g = -0.33). Increasing access to other people was the most effective strategy for promoting objective social contact (Hedges’ g = 0.67). Providing adults with skills to manage maladaptive attributional biases, fear-related avoidance behaviour, and barriers to social contact was the most effective strategy for addressing deficits in the perceived quality of social connections (Hedges’ g = -0.53).

Conclusion:
In summary, different interventions had differential effects on the frequency and quality of social relationships and associated emotional distress. Psychological interventions focused on reducing maladaptive cognitions and avoidance hold the most promise for increasing meaningful social connections and reducing psychological distress.

4

Semantic fluency and its associated brain activity in Parkinson’s disease with Mild Cognitive Impairment

Dr Ji Hyun Julia Yang, Dementia and Neuro Mental Health Unit, UQ Centre for Clinical Research

Jihyun Yang\textsuperscript{a}, Gerard J. Byrne\textsuperscript{a,b}, Katie L. McMahon\textsuperscript{a}, David A. Copland\textsuperscript{a,d}, John D. O’Sullivan\textsuperscript{a,c}, Nadeeka N. Dissanayaka\textsuperscript{a,c,d}\textsuperscript{*}

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\textsuperscript{b}Mental Health Service, Royal Brisbane & Women’s Hospital, Herston QLD Australia
\textsuperscript{c}School of Clinical Sciences, Queensland University of Technology Brisbane QLD Australia
\textsuperscript{d}School of Health & Rehabilitation Sciences, The University of Queensland, St Lucia QLD Australia
\textsuperscript{e}Department of Neurology, Royal Brisbane & Women’s Hospital Herston QLD Australia
\textsuperscript{f}School of Psychology, The University of Queensland, St Lucia QLD Australia

Background Language impairment is common in Parkinson’s disease (PD) and there is a growing interest in language difficulties in PD typically in verbal fluency. Deficits in verbal fluency can be detected in early stages of PD, and even prior to the onset of motor symptoms. Poor verbal fluency is also reported to increase the risk of PD with dementia. This study investigates the performance of three different types of verbal fluency: phonemic, semantic, and semantic switching, in PD patients with and without MCI. Neural underpinnings of semantic fluency deficits in PD patients with and without MCI is examined.

Methods Thirty-seven (37) PD patients and 20 gender- and age-matched HC completed an assessment package and fMRI. Thirteen (13) PD patients fulfilled criteria for PD-MCI. Participants completed DKEFS verbal fluency tests including, phonemic, semantic and semantic switching. Participants were scanned (3T Siemens PRISMA) whilst performing semantic fluency tasks consisting of semantic, semantic switching, and automatic response.
The number of responses, number of errors, and fMRI data were analysed for category generation and category switching.

Results Patients with PD-MCI performed significantly worse than PD-NC and HC during phonemic, semantic and semantic switching tasks. There was no difference between PD-NC and HC. Phonemic impairment was greater than the semantic impairment in PD-MCI group. Patients with PD-MCI showed greater activity in the right angular gyrus compared to PD-NC and HC during semantic switching. Increased activity correlated with worse verbal fluency performance during the semantic fluency task.

Discussion Our study provided promising evidence of impaired verbal fluency in PD-MCI compared to PD-NC and HC. Increased right angular gyrus activity in PD-MCI during semantic switching suggests additional recruitment of the brain possibly due to inefficient activation in the task dominant region or impaired inhibition of the non-dominant region.

5 Therapy to Reduce dementia risk in Parkinson’s disease (TRIP): Proof-of-concept trial Dana Pourzinal, PhD Student, UQ Centre for Clinical Research, University of Queensland

Dana Pourzinal1, Arnold Bakker2,3, Gerard Byrne4, Katie L. McMahon5, John O’Sullivan1,6, Robert Adam1,6, Alexander Lehn7, David Copland8, Jihyun Yang9, Tiffany Au1, Roberta Littleford1, Mark Chatfield1, Gregory Pontone2,3, Zoltan Mari3,9, Nadeeka Dissanayaka1,5,10

1 UQ Centre for Clinical Research, Faculty of Medicine, The University of Queensland, Royal Brisbane & Women’s Hospital, Herston QLD 4029, Brisbane, Australia.
2 Department of Psychiatry and Behavioral Sciences, Johns Hopkins University, Baltimore, U.S.A.
3 Department of Neurology, Johns Hopkins University, Baltimore, U.S.A.
4 Mental Health Service, Royal Brisbane & Women’s Hospital, Herston, QLD 4029, Brisbane, Australia.
5 School of Clinical Sciences, Queensland University of Technology, Brisbane QLD 4000, Australia.
6 Department of Neurology, Royal Brisbane & Women’s Hospital, Herston QLD 4029, Brisbane, Australia.
7 Department of Neurology, Princess Alexandra Hospital, Woolloongabba QLD 4102, Brisbane, Australia.
8 School of Health & Rehabilitation Sciences, The University of Queensland, St Lucia, QLD 4067, Brisbane, Australia.
9 Cleveland Clinic Lou Ruvo Center for Brain Health, Las Vegas, U.S.A.
10 School of Psychology, The University of Queensland, St Lucia, QLD 4067, Brisbane, Australia.

Background: Mild memory impairment, termed amnestic Mild Cognitive Impairment (aMCI), is associated with rapid progression toward dementia in Parkinson’s disease (PD). An established marker of aMCI leading to Alzheimer’s disease is hyperactivation of hippocampal subfields (DG/CA3) during an episodic memory task. This project investigates efficacy of a repurposed antiepileptic drug, levetiracetam, in low doses as a treatment targeting DG/CA3 hyperactivation to improve episodic memory deficits in PD-aMCI. Based on previous work, it is hypothesized that levetiracetam will normalize DG/CA3 activation and improve memory performance in PD-aMCI patients.

Materials and Methods: Twenty-eight PD-aMCI patients, 28 PD patients without memory impairment (PD-nMCI) and 28 healthy controls will be recruited. PD-aMCI participants undertake a 12-week randomised placebo-controlled double-blind cross-over trial.
(clinicaltrials.org: NCT04643327) with 2-week treatment periods on 250mg/day levetiracetam or placebo, separated by a four-week washout period. After each treatment period, participants complete an episodic memory task designed to tax DG/CA3 function during high-resolution functional Magnetic Resonance Imaging (fMRI). PD-nMI and healthy controls will undergo the fMRI protocol only, to compare baseline DG/CA3 activity.

Results: Episodic memory task performance and DG/CA3 activation during the fMRI task will be primary outcome measures. Global cognition, PD severity, and adverse events will be measured as secondary outcomes.

Conclusions: This study is the first of its kind in PD and will establish proof-of-concept of levetiracetam as an early therapeutic option to reduce dementia risk in PD.

6

Elecys automated immunoassay to supporting the diagnosis of Alzheimer’s disease in Australia

Dr Qiao-Xin Li, National Dementia Diagnostics Laboratory, Florey Institute, The University of Melbourne


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b. Australian e-Health Research Centre, CSIRO, Brisbane, QLD, 4029, Australia.
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Background: Alzheimer’s disease (AD) biomarker proteins, amyloid β1-42 (Aβ42) and Tau (Phospho-tau 181 [pTau] or Total-tau [tTau]), in the cerebrospinal fluid (CSF) are used to support the clinical diagnosis of AD, and for enrolment of patients into therapeutic trials. As a National Association of Testing Authorities (NATA) accredited National Dementia Diagnostics Laboratory (NDDL), we have used the sandwich ELISA (INNOTEST), achieving ≥92% sensitivity and specificity to predict AD. We are now using the automated Elecsys assay from Roche, recently accredited by NATA. The Australian Imaging, Biomarkers and Lifestyle studying of ageing (AIBL) participated in the assessment of the assay, in collaboration with Roche and international groups, determining the ratios pTau/Aβ42 and tTau/Aβ42 had areas under the curve of >0.90, and concordance with Aβ-PET (overall percentage agreement >90%), across multiple large research cohorts. Methods: Using clinical CSF samples collected from local hospitals/clinics, we examined the correlation of the biomarkers obtained from the automated Elecsys vs the manual INNOTEST immunoassays and the concordance of diagnostics outcome between the two methods.

Results: We have tested 34 newly collected CSF from the AIBL cohort, with correlations of 0.91, 0.98, and 0.97 (Spearman) for Aβ42, pTau181, tTau between INNOTEST and Elecsys methods, respectively. From 166 clinical diagnostic CSF samples (from local hospitals), the correlations were 0.89, 0.93, 0.88, respectively. Using the Aβ42 and pTau as primary
parameters, the diagnostic outcome is highly concordant between two methods in these two groups. Discussion/Conclusion: The automated Elecsys with lower interassay and interlaboratory variation percentages offers a more precise result and high concordance with the INNOTEST. This supports the use of Elecsys for CSF AD diagnostics in routine practice.

7
Building a Modular Protein Nanoparticle Platform for Active Immunotherapy Against Alzheimer’s Disease

India Boyton, PhD Student, School of Life Sciences, University of Technology Sydney

India Boyton, Hayley Goodson, Lars Ittner, Lyndsey E. Collins Praino, & Andrew Care.

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Department of Molecular Sciences, Macquarie University, NSW 2109, Australia
Adelaide Medical School, The University of Adelaide, Adelaide, 5005, SA, Australia.

Active immunotherapy aims to harness a patient’s immune system to recognise and selectively clear pathological entities from the body. This approach is particularly promising for treating Alzheimer’s Disease (AD) as it bypasses the need to deliver a therapeutic directly into brain. As such, a number of newly developed vaccine formulations targeting abnormal variants of Aβ or tau have undergone clinical trials. Whilst some of these vaccines enable the targeted clearance of abnormal Aβ or tau from the brain, their capacity to halt cognitive decline was not observed, possibly due to the low immunogenicity of antigens and/or the propensity to focus on a single pathogenic protein. Therefore, given the complex and highly heterogenous nature of AD pathophysiology, a vaccine that simultaneously targets both abnormal Aβ and tau species may improve treatment efficacy.

To this end, we are investigating protein nanoparticles as a vaccine platform for the dual-display and delivery of both abnormal Aβ and tau epitopes for the combinatorial treatment of AD. Encapsulins are an emerging class of protein nanoparticles found in nature that self-assemble into hollow cage-like structures. They have demonstrated early promise as a vaccine platform and been shown to elicit both humoral and cellular immune responses in vivo. Furthermore, the outer and inner surfaces of encapsulins can be readily engineered to display and/or package peptide/protein antigens, thus representing an exciting and versatile system for the rational design of vaccines with multiple modalities.

Herein, I will present the characterisation of encapsulins’ unique structural properties, stability, and a number of different conjugation strategies we are exploring for the modular attachment of Aβ and tau epitope variants. Future work will focus on understanding the in vivo bio-nano interactions of encapsulins and assessing the capacity of Aβ and tau epitope-displaying encapsulins to induce functional immune responses in mouse models.
Nutrient Intake and Its Effects on Health Outcomes in Older Australian Men

Associate Professor Vasant Hirani, Faculty of Medicine and Health, School of Nursing, University of Sydney

Objective: To examine associations between nutrient intakes, dietary patterns and a range of health outcomes.

Methods: Men aged 70 years and older from the Concord Health and Ageing in Men Project (CHAMP) were assessed at baseline (2005-2007, n=1705), 2-year follow-up (2007-2009, n=1367), 5-year follow-up (2010-2013, n=958) and 8-year follow-up (2014-2016, n=781). Nutrition data were first collected at 5-year follow-up. The 5-year follow-up is considered as baseline nutrition and 8-year follow-up as 3-year follow-up. At all assessments, dietary intake was determined using a diet history questionnaire. Dietary adequacy of nutrient intake was assessed by comparing participants’ intake of each nutrient with the Nutrient Reference Values for Australia. Attainment of the NRVs of micronutrients or antioxidants or essential nutrients was incorporated into a dichotomised variable using the cut-point method. Individual nutrients were also categorised into quartiles or quintiles. Sources of protein were also captured. Additionally, two different dietary patterns (the Mediterranean and Australian Dietary Guideline Index), monounsaturated: saturated fat and n-6:n-3 fatty acids ratio and individual nutrients were used as predictor variables. Cross-sectional and longitudinal data were collected on frailty, muscle mass and strength, depressive symptoms, cardiovascular disease and mortality.

Results: Inadequate intake of antioxidants, particularly vitamin E and zinc, at baseline nutrition was associated with incident frailty, depressive symptoms and congestive cardiac failure in prospective analyses.

Inadequate nutrient intake, particularly protein, n-6 PUFA, n-3 PUFA, magnesium and calcium, was significantly associated with sarcopenia. In addition, each unit decrease in the n-6:n-3 ratio was significantly associated with a 9% increased risk of sarcopenia.

Our findings showed a U-shaped association between total protein intake and all-cause and cancer mortality. Plant protein was inversely associated with all-cause and cancer mortality, whereas animal protein intake was positively associated with all-cause mortality.

Conclusion: Overall, findings from these studies suggest that inadequate intake of micronutrients, particularly antioxidants, are plausible factors for poor health outcomes in older men. The conclusion can therefore be drawn that encouraging a healthy diet characterised by plenty of plant-based food and limited amounts of animal-based food may contribute to long-term health benefits in older Australian men.
The role of financial literacy when paying for aged care

Professor Henry Cutler, Director of Macquarie University’s Centre for the Health Economy, Macquarie University

Deciding how to pay for accommodation when entering residential aged care in Australia is complex. It can impact the residents’ income, savings and wealth, along with their bequest value. Many older Australians and their informal carers lack financial literacy, which increases the likelihood of making suboptimal accommodation payment decisions. This may be exacerbated by cognitive decline. Our study examines how the financial literacy of informal carers impacts accommodation payment decisions made by Australians when entering residential aged care. It draws on an Australia wide survey to measure financial literacy among informal carers who helped residents make their accommodation payment decision. We used a set of regressions to estimate the relationship between the respondent characteristics and financial literacy, financial literacy and financial adviser use, and financial literacy and accommodation payment decision confidence, complexity, and stress. We found less than half of respondents were financially literate. Many exhibited underconfidence in their financial literacy, while others were overconfident. Both may lead to suboptimal accommodation payment decisions. We found aged care providers had a greater impact on using a financial adviser than financial literacy, suggesting a principal-agent relationship exists. Our results suggest higher financial literacy may reduce some decision complexity but its relationship with decision confidence was weak and its relationship with decision stress was not significant. These relationships were moderated by the perceived time available to decide on an accommodation payment. Increasing financial literacy is unlikely to substantially help people make a better accommodation payment decision. Increasing access to financial advice may reduce the likelihood of making suboptimal decisions, but limited trust and anxiety with using a financial adviser means there is no guarantee that people would use this service. Making the accommodation payment choice simpler may increase welfare by reducing the potential to make a suboptimal accommodation payment decision and reducing decision stress.

10

Abstract Title: Managing COVID-19 research related challenges at Macquarie University: reactive vs proactive approach.

Dr Yordanka Krastev, and Jennifer Rowland, Macquarie University

The Covid-19 pandemic has resulted in severe global social and economic disruptions shutting down major capital cities. Australian Universities were forced to move teaching and learning activities to online delivery and restrict all face-to-face human participant research. This created mixed reactions across the Universities resulting in inconsistent messages from the University Executive, Faculties, and Departments. The workload of the Macquarie University Human Research Ethics Committee increased, having to “police”, guide and communicate with researchers. Whilst humanities and social sciences research was able to pivot to online platform delivery, most clinical research had to continue face-to face for the health and wellbeing of the participants.
We present a few strategies adopted by Macquarie University ethics and clinical research governance teams in facilitating the research during the pandemic, and in particular, clinical research and human participant activities. We use an example from the Faculty of Medicine, Health and Human Sciences, which was the first to design a COVIDSafe process for allowing research to recommence. We also discuss our collaborative approach in creating streamlined processes for expedited ethics and governance reviews and supporting Standard Operating Procedures.

The pandemic experience highlighted the importance of the collaboration between researchers, governance, and ethics in facilitating the conduct of good research.

11

**Motif-Specific Anti-PrPC Antibodies Induce Neuronal Hypersensitivity.**

_Utpal Kumar Adhikar, PhD Student, School of Medicine, Western Sydney University_

_Utpal Kumar Adhikari1, Mourad Tayebi1_

1School of Medicine, Western Sydney University, Campbelltown, NSW, Australia.

Prion diseases are fatal neurodegenerative disorders that are believed to be caused by the pathogenic conversion of the cellular prion protein (PrPC) into the abnormal and partially protease-resistant, PrPSc. The molecular mechanisms underlying the IgG-mediated neurotoxicity and the role of the activated proteins in the apoptotic pathways leading to neuronal death following treatment with anti-PrPC antibodies has not been properly defined. Several previous studies have linked a variety of proteins, including apolipoprotein E, cytoplasmic phospholipase A2, prostaglandin, and calpain with anti-PrP antibody-mediated 'apoptosis,' but these proteins are also known to play a key role in allergic responses. Therefore, we investigated whether cross-linking PrPC with anti-PrPC antibodies stimulate a neuronal allergic response. Here, we show that the allergic effects triggered by the anti-PrPC antibodies are more potent when antibody-treated mouse microglia cells (N11) are co-cultured with the mouse neuroblastoma (N2a) cell line. Initially, we found both tail- and globular-domain epitopes are allergic in the in-silico studies. Following direct application of anti-PrPC antibodies on N2a cells, we found 4 neuronal allergic-related proteins when compared with untreated cells. Furthermore, we identified 8 neuronal allergic-related proteins following treatment of N11 cells with anti-PrPC antibodies prior to co-culture with N2a cells when compared with untreated cells. Antibody treatment of mouse primary neuron (MPN) cells or MPN co-cultured with antibody-treated N11 led to identifying 10 and 7 allergic-related proteins when compared with untreated cells. The biological testing with western blotting confirmed the presence of FcɛR1a in both DAT (direct antibody treatment) and DMT (direct microglia treatment) of MPN and N2a. This study showed for the first time that anti-PrP antibody binding to PrPC triggers a neuronal allergic response and highlights the important role of microglia in triggering an IgG-mediated neuronal allergic toxicity. Moreover, this study provides an important impetus for including allergic assessment of therapeutic antibodies for neurodegenerative disorders to derive safe and targeted biotherapeutics.
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