2005 Dementia Grants Program Successful Applicants

**AAR Dementia Research Grant**

**Dr. Julie Henry, University of New South Wales**

**Emotion regulatory deficits in relation to Alzheimer's disease**

Increasing evidence suggests that Alzheimer’s disease is characterised by deficits in emotional processing, in addition to problems with memory and cognitive impairment. However, prior studies have focused only on the assessment of basic emotions, depression and emotion recognition. This project will be the first to assess whether people with Alzheimer’s disease are impaired in the capacity to regulate emotions, and if so, whether specific types of emotional regulation are differentially affected. This project will help clarify the role of emotional control deficits in Alzheimer’s disease. It will also help identify the mechanism that underpins the association between emotional processing deficits and Alzheimer’s disease, and delineate the relationship between cognitive and emotional control. By enhancing our understanding of the underlying cause of changes in emotional and social behaviour following Alzheimer’s disease, this will help improve their future prediction, management and treatment. The proposed research will thus extend prevailing models of emotional regulation in Alzheimer’s disease, with important implications for development of intervention-based treatments.

**AAR Dementia Research Grant**

**Agnes Luty, The Garvan Institute of Medical Research**

**Positional cloning of a novel Alzheimer’s disease locus associated with atypical plaque-predominant neuropathology**

Alzheimer’s disease is a devastating and widespread neurodegenerative disorder typically characterised by the massive accumulation of plaques and neurofibrillary tangles (NFTs) in the brains of affected people. However, a small proportion of cases have an unusual neuropathology characterised by the absence of neurofibrillary tangles and a predominance of plaques. We have identified two family pedigrees with ‘plaque-predominant’ Alzheimer’s disease (PPAD) which show genetic linkage to a single significant region on chromosome 9. The aims of this project are the positional cloning and biological characterisation of this potentially novel Alzheimer’s disease gene. This project will aid in clarifying the relative contribution of the two neuropathological features in the development of the disease and possibly help identify risk factors for Alzheimer’s disease in the general population and allow predictive testing for at risk-family members. Finally, the novel gene product represents an ideal target for drug screening to identify candidate molecules for therapeutic intervention and new drug development.

**AAR Dementia Research Grant**

**Dr. Deborah Tew, University of Melbourne**

**Characterisation of the wild-type and familial mutant forms of amyloid beta**

The protein plaques found in the brains of people with Alzheimer’s Disease contain aggregates of misfolded amyloid beta (Aβ), which is a naturally occurring protein. While the majority of cases of Alzheimer’s disease are sporadic with a late age of onset, there are a number of mutations in the Aβ protein which are connected with younger onset Alzheimer’s disease. Using spectrophotometric and other biophysical techniques, this project will examine and describe the characteristic biophysical differences between these variants and the wild-type forms of the protein. The knowledge gained from this study will add to our understanding of the changes in the protein that lead to the disease state in the normal brain. Firstly, with this knowledge we will be better able to identify novel targets for drug design and secondly, strategies developed and employed in this project will have the potential to form the basis of future assays to determine the efficacy of potential drug candidates.
Rosemary Foundation Loader Research Scholarship  
Stephen Duma, Prince of Wales Medical Research Institute  
A brain imaging study of the role of the pre-supplementary motor area in extrapyramidal motor slowing: A predictor of cognitive decline and dementia

Progressive motor slowing has been found to be associated with cognitive impairment and can predict incident dementia. This project aims to identify the brain region and cause of progressive motor slowing associated with ageing. The project will examine the hypothesis that motor slowing is connected to a specific brain region called the pre-supplementary motor area of the frontal lobe (pre-SMA). Using brain imaging techniques, we will look at the pre-SMA brain region in people with Parkinson’s disease, people with motor slowing and normal older and younger adults. This project is an essential step to future prevention, therapy and reduction of reduced mobility, falls and dementia. An understanding of the functional role of the pre-SMA, along with its connections will enable future research into the underlying pathology of age-related motor slowing. Our study will detect functional deficits observed in subjects with motor slowing, enabling a better understanding of a key predictor of dementia. These findings can then be used to further investigate underlying causes of such deficits, and in turn the underlying causes of dementia.

Alzheimer’s Australia Research Travelling Scholarship  
Stephen Duma, Prince of Wales Medical Research Institute  
To learn the technique of transcranial sonography (TCS) for the study of incident Lewy body disorders and dementia in “normal” older people and older people with motor slowing.

With an ever increasing ageing population, the prevalence of neurodegenerative disorders in society will also increase. Amongst the most prevalent of these neurodegenerative disorders are Alzheimer’s disease, Parkinson’s disease and dementia with Lewy bodies. It has been shown that both motor slowing and mild cognitive impairment can predict incident dementia. The pathology underlying motor slowing is unknown, but changes in a specific brain region, the substantia nigra, may be visible when viewed with the imaging method transcranial sonography (TCS). The purpose of this travel project is to train in the technique of TCS to be able to perform this analysis in Australia. TCS may prove to be a non-invasive, inexpensive and efficient tool to predict incident Parkinson’s disease, Parkinson’s with dementia, dementia with Lewy bodies, or mixed dementia. Early (pre-clinical) diagnosis is very important for the effective management and treatment of all types of dementia. These preliminary studies will enable further studies into the underlying pathology that causes brain changes in the substantia nigra, and in turn develop a further understanding of dementia, its predictors and its causes.

Rosemary Foundation Travelling Fellowship  
Dr. Greg Savage, Monash University  
Presentation at International Neuropsychological Society Conference, Boston, February 2006

Accurate early diagnosis of Alzheimer’s disease is very important. Current diagnosis of Alzheimer’s disease relies heavily on assessment of cognition and formal neuropsychological assessment. Unfortunately, the disease has progressed significantly by the time such an assessment is typically performed. This travel grant will assist in the promotion of findings concerning an inexpensive and efficient diagnosis test which should be sensitive at an earlier stage of progression. Intervention at the earliest possible stage has huge implications for the ultimate social and economic burden of Alzheimer’s disease; better assessment of early signs is intimately related to better understanding of dementia, and will contribute directly to management in the short and long term. I will be presenting a research paper at the 2006 North American Meeting of the International Neuropsychological Society (INS). The paper presents important findings from a test of smell functioning we have developed which may be able to detect the earliest signs of Alzheimer’s disease. I will also meet with collaborators concerning the development of a face recognition test in a reaction-time-based computerised test format. We will investigate the extent to which face recognition problems are evident in Alzheimer’s disease, and whether their quantification can also contribute to early diagnosis.
Hunter Doctoral Research Scholarship into the Causes of Alzheimer's Disease
Lolita Warden, Prince of Wales Medical Research Institute
Supervisor: Dr. Claire Shepherd

Identifying important mediators of tau pathology in Alzheimer's disease: the role of inflammation

Amyloid protein deposition, tau pathology and inflammation are key hallmarks of Alzheimer’s disease in the brain. The exact mechanism of inflammation in Alzheimer’s disease is yet to be determined. This project is designed to determine major stimuli of inflammation, and to determine their effects on tau pathology and neuronal toxicity, both directly and indirectly. To date no studies have undertaken a comparative analysis of the major stimulators of inflammation and associated pathologies in a human cell culture system, and we will be the first group to examine the effect of ‘inflammatory’ plaques on these changes. Only by addressing these aims can we concentrate on developing effective therapeutic strategies.

AAR Grant in Prevention and Risk Reduction
Associate Professor Glynda Kinsella, La Trobe University

Memory Group Intervention for Mild Cognitive Impairment

It is increasingly recognised that Alzheimer’s disease develops slowly over many years and that people with isolated memory impairment or mild cognitive impairment are at increased risk of subsequently developing Alzheimer’s disease. The earlier that compensatory memory strategies can be introduced to people with declining memory, the more likely it will be that memory strategies will be used effectively in everyday life, reducing and delaying the impact. The primary aim of this study is to provide early intervention for developing memory difficulties in older adults. We will evaluate the efficacy of an interactive memory-group program which will involve both the family and person with memory difficulties in developing increased awareness of memory issues and specific strategies to prevent memory failures. Information about memory and systematic training in skills are expected to significantly improve the capacity of patients and families to cope with everyday memory difficulties. Through active participation in the management of memory impairment, it is expected that the level of wellbeing of all participants will increase and that there will be an improved use of memory strategies in everyday life.

Hazel Hawke Research Grant in Dementia Care
Associate Professor Cherry Russell, University of Sydney

Dying with dementia: An exploratory study of family caregiver perspectives on best quality care and support practices at the end of life

This project aims to better understand the end-of-life care needs of people with dementia and their family caregivers. To date most research and policy directed towards the impacts of dementia have focussed on the needs of those in the early and mid-stages of the disease. Relatively little attention has been paid to the specific challenges facing family caregivers in the treatment of persons with advanced dementia, yet they have been shown to have significant concerns about their relative’s quality of life in the year before death and unmet support needs of their own. The study will collect in-depth interview data from a purposive sample of persons who have cared for a family member through the terminal stage of dementia. The project will yield previously unavailable information about the experiences of caregivers of people dying with dementia, their views about quality of life, the range of specific care issues and concerns surrounding end of life treatment, and a critical foundation for future research and development of evidence-based practice guidelines for enhanced care quality.