Dementia Research Australia: the Australian Dementia Research Development Fellowship Program

Ashley I. Bush¹ • George Fink¹ • Peng Lei^{1,2}

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Dementia affects hundred millions of people worldwide, and with no disease-modifying treatment for any form of dementia, the disease burden is worsening. Accelerating innovation in the diagnosis, prevention, treatment, and management of dementia (including its most prevalent form, Alzheimer's disease, AD) is a global priority.

In Australia, dementia is now the second leading cause of death. Over 320,000 Australians are living with dementia, including one in four Australians over the age of 85. Deaths due to dementia have increased approximately 137 % over the last 10 years, with nearly 11,000 deaths recorded in 2013. The increasing prevalence is placing a growing emotional and financial burden on patients, their families, and friends. By 2050, it is estimated that nearly one million Australians will have dementia, and 7500 Australians will be diagnosed each week, with a far greater number living with this progressive disabling condition.

The Australian government announced as part of the 2014 budget an additional \$200 million over 5 years to boost Australia's dementia research capacity. In concordance with this initiative, the National Health and Medical Research Council (NHMRC), working in close collaboration with the

Australian Research Council (ARC), launched a joint NHMRC-ARC Dementia Research Development Fellowships Scheme on 8 January 2015 as part of the "Building the workforce" element of the Boosting Dementia Research Initiative. The aims of the scheme were to support the best emerging dementia researchers and attract scientists into dementia research from other fields, such as neurobiology, immunology, chemistry, bioengineering, information and communications technology, genomics, epidemiology, and cell and vascular biology. Applications were peer reviewed by expert panels against the dementia priority framework based on national and international strategies spanning primary prevention, secondary prevention, treatment, and quality of life and care. As a consequence, Dementia Research Development Fellowships were awarded for the most promising projects.

The present issue of the *Journal of Molecular Neuroscience* is comprised of cutting-edge review articles written by individual Dementia Research Development Fellows and their colleagues. This issue provides a comprehensive peer-reviewed, state-of-the-art account of dementia and related neurodegenerative disorders ranging from clinical, brain imaging, molecular biological mechanisms, and potential therapeutic targets, and covers all major forms of dementia, including AD, vascular dementia, dementia with Lewy bodies, frontotemporal lobar degeneration, and Parkinson's disease dementia.

In this issue, a collection of articles were chosen to discuss important proteins and other biological factors involved in dementia, including tau protein (Li et al. 2016), apolipoprotein E (ApoE ϵ 4, Mahoney-Sanchez et al. 2016), BACE1 (Munro et al. 2016), presenilin (Greenough 2016), metals (McAllum and Finkelstein 2016), and gonadal hormone (Du and Hill 2016). In addition to neurons, the potential involvement of microglia in AD is discussed (Grubman et al. 2016). A second

✉ Ashley I. Bush
ashley.bush@florey.edu.au

✉ George Fink
george.fink@florey.edu.au

✉ Peng Lei
peng.lei@scu.edu.cn; peng.lei@florey.edu.au

¹ Florey Institute of Neuroscience and Mental Health, The University of Melbourne, Parkville, VIC 3010, Australia

² Department of Neurology, State Key Laboratory of Biotherapy, West China Hospital and Collaborative Innovation Center for Biotherapy, Sichuan University, Sichuan 610041, China

set of articles presented novel tools that can be used in dementia study, from clinically available magnetic resonance imaging (Yassi et al. 2016), the Cogstate Brief Battery (Lim et al. 2016), to a more under experimental development touchscreen platform for cognitive testing (Shepherd et al. 2016) and fluorescent nanoparticles to deliver drugs (Shimoni et al. 2016). Lastly, this issue also covers clinical findings relevant to dementia, including age-related prevalence of ApoE ϵ 4 in AD (Heffernan et al. 2016), the potential to utilizing subjective cognitive decline for AD clinical trial (Buckley et al. 2016), and linkage between cognitive decline and alcohol abuse (Perry 2016).

Australia has a proud history of participation in dementia research (especially Alzheimer's disease), with an Australian, Colin Masters, being one of the first to complete the sequence of beta-amyloid which is still the main therapeutic target for AD (Masters et al. 1985) and the first to clone the amyloid protein precursor gene (Kang et al. 1987). With the Boosting Dementia Research Initiative, we hope to maintain the leadership of Australia in dementia research.

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