AIBL Final Report Summary

Alzheimer's disease has become a major social and economic global issue and is a major threat as we live longer. The prevalence of dementia in Australia is expected to increase fourfold to nearly 900,000 by 2050 without successful interventions. The Australian Imaging Biomarkers and Lifestyle study of ageing (AIBL) focuses on understanding the development of Alzheimer's disease (AD) and the identification of factors that influence it.   It is a collaboration between Austin Health, CSIRO, Edith Cowan University, the Florey Institute of Neurosciences and Mental Health, and the National Ageing Research Institute. It comprises a cohort of more than 1112 subjects, all aged over 60 at time of recruitment who are either healthy, have minor memory issues, mild cognitive impartment, or a definitive diagnosis of Alzheimer's disease. Every 18 months since its inception in 2006-2007, all volunteers have undergone extensive psychological and cognitive assessments, lifestyle assessment, and blood analysis for comprehensive clinical chemistry evaluations. Many of the subjects also undergo brain imaging (MRI and PET) in each cycle. This data is used for research that aims to identify biomarkers that can be used to diagnose and monitor individuals who will develop Alzheimer's disease, as well as to identify lifestyle risk factors.

SIEF funded the 36month and 54month collection points. With 69% of the original participants undergoing the 54 month collection, the retention rate over the course of the study is enviable of any trial let alone a trial in the elderly. Additionally, to maintain the cohort at 1000 people, SIEF funded recruitment of 250 new participants into the study. The study has attracted strong interest from the pharmaceutical and health industry because of the reliability of the data and strong adherence to best practice standards for sample collection and clinical review (by a single panel).
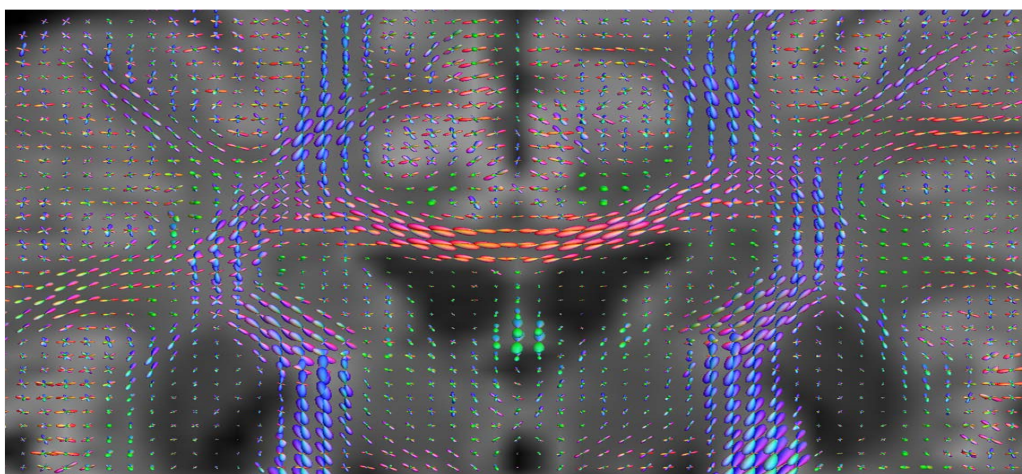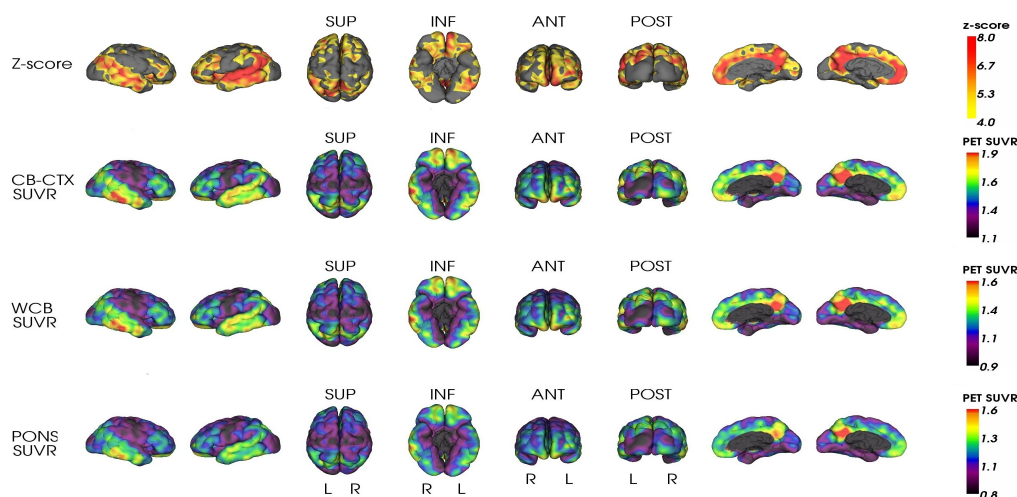
Over the course of SIEF funding, the AIBL study has become one of the largest, well-characterised, longitudinal prospective cohorts of healthy ageing, cognitive decline, imaging and blood based biomarkers for Alzheimer's Disease in the world. The quality and impact of the AIBL data are widely acclaimed world-wide. SIEF funding, together with industry support, has:

1. enabled the exploration and establishment of some of the critical baseline data for disease intervention. These data provide strong support to industry and academia to accelerate clinical trial design and testing that will speed the development of therapeutic and lifestyle interventions to inhibit progression to disease
2. established a disease trajectory of 17 years prior to the onset of dementia. This window provides an opportunity for lifestyle and pharmaceutical companies to intervene early, before irreversible brain damage has occurred.
3. defined early measures of cognitive decline
4. associated physical activity and Mediterranean dietary pattern with reduced risk for disease
5. played a key part of setting standardisation protocols for Alzheimer's Disease including blood biomarkers and MRI, where AIBL data can be used as foundation

data to establish diagnostic criteria for preclinical disease. Facilitated the training of 5 PhD students and 5 postdoctoral fellows directly funded by SIEF

6. Contributed to publication of 62 Peer reviewed research publications mostly high impact, and 67 International Conference presentations including International Prizes for the best Alzheimer's imaging research over the last two consecutive years. Enabled AIBL to establish an IP portfolio of 3 patents and licensable software

7. Furthered international research efforts in AD through the AIBL data being made accessible to researchers worldwide via a new paradigm of research data sharing with the parallel study in USA ADNI. Additional cohorts have since been built leveraging the AIBL and US ADNI experience. This has facilitated AIBL international collaboration and co-operation for understanding AD.

Overall, this study has firmly established this living infrastructure as support to both academic and industrial research aiding in the understanding of the biomarkers for early detection, and the natural history and lifestyle patterns to development of AD. In addition to SIEF, AIBL is indebted for the significant industry investment of $9M to help support the study. This has provided important international investment in this key Australian research.

www.AIBL.csiro.au