



**Application number/Title:** 42596 - Harmonising large-scale imaging databases to provide integrated assessments of the role of white matter hyperintensities in cognitive aging

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**Keywords provided by the Applicant PI to describe the research project:** cognitive ageing, dementia platform uk, harmonisation, neuroimaging, white matter hyperintensities

**Application Lay Summary:**

With a growing aging population, the burden of people living with dementia is a major public health issue in the UK. Early identification of markers of future cognitive impairment would greatly enhance our ability to understand and manage dementia. To develop such markers requires the study of large populations of healthy individuals as well as those with the disease. In the UK there have been a number of brain imaging studies investigating specific populations that could be used to identify markers of future cognitive impairment. Ideally, we would like to combine the data from these studies to gain a broad cross-section of the population from which to identify reliable markers.

However, differences in these studies - for example, the types of scanners used - means that it is currently not possible to combine these datasets. What is required is methods to "harmonise" the data, so the different studies provide comparable images. Our Discovery Award proposal aims to develop approaches to harmonise imaging datasets provided on the Dementias Platform UK (DPUK), with UK Biobank being one of them. In particular, we are focusing on harmonising measures of "white matter hyperintensities" - particular features observed in the brains of aging individuals that have been linked to cognitive impairment. With an estimated duration of 24 months, this work will provide harmonised neuroimaging data that other researchers can use to explore how this feature might be linked to cognitive impairment. This will enable new questions to be asked about the causes of dementia, supporting scientific progress and possibly future clinical applications.