

Lay Summary

BRAIN UK Ref: 18/002

Understanding the neural substrates of visuospatial memory and how this is affected by epilepsy and Alzheimer's Disease.

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“Pattern Separation” is your brain’s ability to differentiate similar but distinct objects or arrangements of objects (e.g. ‘where I put my keys today’ vs ‘where I put them yesterday’). It is dependent on a particular set of cells in the memory region of the brain and is important for the encoding and recollection of memories. Animal studies have shown that the seizures associated with epilepsy cause heavy loss of one of the types of cell that are activated during this task. It is also known that the region of the brain where these cells are found is affected by ageing and by the processes that lead to dementia, suggesting that the same cells that are affected by epileptic seizures may also be affected by Alzheimer’s Disease. The aim of this study is to analyze the area associated with memories in human brain tissue, to establish if there is a difference in various cell populations in participants with epilepsy and Alzheimer’s. This will later be used as a critical input to future studies characterizing the pattern separation performance of people with and without epilepsy.