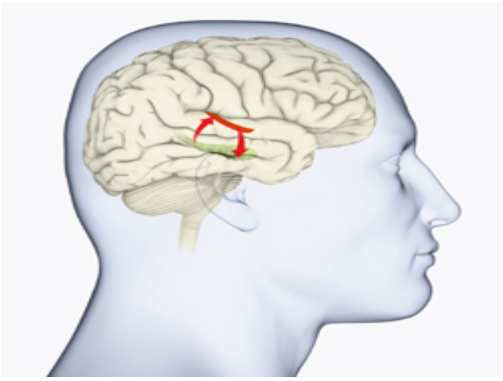
Cerebral representation of object-location memory

Results in Brief

Lateralisation of object location memory

Crucial for survival, spatial memory is the formation and recall of objects and their location in space. Research is delving into the areas of the brain responsible and in particular, the extent of lateralisation – right or left brain-centred.

HEALTH



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Despite the importance of object-location memory to life skills, the organisation of the function between right and left hemispheres in the brain is little understood. The 'Cerebral representation of object-location memory' (SPATIAL MEMORY) project is investigating the two distinct processes involved – object processing and spatial location processing.

Combining functional magnetic resonance imaging and intracranial electroencephalography recording with neuropsychological assessment, the researchers looked at healthy subjects and patients with mesial temporal lobe epilepsy (MTLE). MTLE is the most common form of epilepsy in adults, and seizures normally originate in the hippocampi, important memory centres within the temporal lobes.

The researchers have carried out a series of behavioural tests on object and spatial recognition memory performance. Initial tests failed to produce similar results to a

paradigm (developed in 2009 by Bellgowan). Consequently the team modified the protocol to eliminate stimulus colour as a reference for object identity. Moreover, the new set up allowed the subjects to equate object and spatial recognition performance during object recognition blocks.

Preprocessing of all functional data from healthy patients has been completed and the second-level group analysis for specific task-related activations is underway. In the next stage, the scientists will recruit epilepsy patients to perform the object and spatial memory paradigm during scanning.

Results from the SPATIAL MEMORY project promise to have a wide-ranging impact on understanding of cognitive processes in the brain generally. In the context of neurodegenerative diseases such as Alzheimer's, this could provide valuable information. For MTLE patients, unravelling the areas of the brain involved in object-location memory will help in further research on the condition and pre-surgical planning.

Keywords

Lateralisation | object location memory | spatial memory | MTLE | hippocampi

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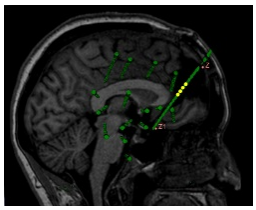

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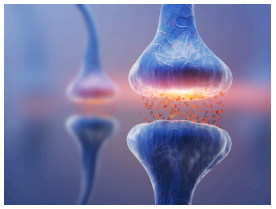

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Project Information

SPATIAL MEMORY

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