Symposium 7: Retrosplenial cortex - a gateway to episodic memories?

Theme: Learning and memory

Supported by Axona

Monday 10th April, 16:20 – 18:00

The retrosplenial cortex (RSC) is one of the most puzzling of cortical brain regions. It is located in the posterior cingulate cortex and it is intimately linked with the extended hippocampal memory system. In addition, it also receives widespread projections from many other cortical brain areas, and forms numerous connections with the thalamus and parahippocampal areas. In rodents, it is a relatively large brain structure while in primates, it is buried deep within the posterior cingulate cortex. In humans it is prominently activated in neuroimaging studies across a plethora of cognitive tasks, particularly those with a spatial or episodic memory component. It also becomes active during memory consolidation. Lesions to retrosplenial cortex in humans produce profound impairments in episodic memory, and in rodents, to a variety of spatial and conditioning tasks. Thus, accumulating evidence points to an important role for retrosplenial cortex in the hippocampal-neocortical interplay that supports formation and retrieval of spatial-episodic memories. Yet we still do not understand its functional contribution to episodic memories. At present there are three prominent, and somewhat related hypotheses concerning the role of retrosplenial cortex in memory: (1) That it mediates between spatial reference frames; (2) That it processes landmarks and landmark stability in service of directional orientation; (3) That it is a repository for consolidated hippocampal-indexed spatial memories.

This symposium will explore possible functions of RSC and will include talks from neuroscientists spanning early, mid and senior career levels, all of whom use many techniques including electrophysiology, behavioural/cognitive testing, neuroimaging and computational modelling to gather research evidence aimed at uncovering the critical role of the retrosplenial cortex in episodic memory.

Chair: Dr Anna Mitchell (University of Oxford)

Co-chair: Professor Kate Jeffery (University College London)

Speaker 1: Dr Anna Mitchell (Oxford)

Neuroimaging of the primate brain without the retrosplenial cortex and its role in memory retention’

Speaker 2: Dr Rafal Czajkowski (Nencki Institute of Experimental Biology, Poland)

'On the outskirts of the spatial memory map: retrosplenial cortex'

Speaker 3: Professor Kate Jeffery (UCL)

'Dissociation of head direction cell reference frames in retrosplenial cortex'

Speaker 4: Dr Andrew Nelson (University of Cardiff)

'Retrosplenial cortex and stimulus control'