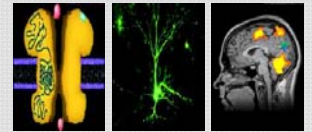


SFB 874 / IGSN

# CONFERENCE



## Cortical and subcortical representation of sensory and cognitive memory

April 28 - 29, 2015 Ruhr University Bochum

Tuesday,

April 28, morning ( 9:15 – 12:15 )

**Session 1:****The temporal lobe: locus for sensory and cognitive integration?**

### EMMA WOOD

Centre for Cognitive and Neural Systems & Centre for Cognitive Ageing and Cognitive Epidemiology,  
University of Edinburgh, UK

### Splitting and lumping: how hippocampal place cells support and constrain spatial learning and memory

The hippocampus plays a critical role in spatial navigation and memory. Research in our lab has focused on how the activity of hippocampal place cells supports these functions. In my talk I will discuss two features of hippocampal place cells activity - splitting and lumping – and their possible role in supporting and constraining spatial cognition. "Splitting" refers to the observation that, when animals are performing a spatial memory task in which they are required to choose between rewarded and unrewarded goal arms on a maze, many hippocampal place cells fire at different rates as the animal traverses the cell's place field on its way to or from different goals. This may provide a mechanism for discriminating among different spatial choices on the maze. The second feature of place cell activity - lumping – refers to the finding that when animals explore a multi-compartment environment comprising several visually and geometrically similar compartments connected by a corridor, place cells fire in equivalent locations across the different compartments (termed place field repetition). I will discuss data suggesting that the ability of place cells to disambiguate among different compartments constrains the ability of animals to differentiate among the rooms at a behavioural level.

