**Spatial memory and theta oscillations in EEG or MEG**

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This project investigates in humans the role of theta-oscillations in spatial memory encoding and retrieval. Using watermaze paradigms in rats, Bast et al (2009) have shown that rapid place learning is highly hippocampus dependent, whereas slow incremental place learning can be achieved without the hippocampus. Theta oscillations and theta-phase coding in the medial temporal lobe, especially the hippocampus, have been suggested as mechanisms for the encoding of sequences (e.g. place sequence while walking through a maze) and to increase the fidelity of spatial memory (Jones & Wilson 2005; Lisman & Jensen 2013). The purpose of this project is to investigate the relevance of theta-oscillations for spatial memory in humans. To this end, we will combine a rapid place learning test in a virtual maze, which has been reverse-translated from the rodent watermaze paradigm (Bast et al., 2009) with non-invasive EEG or MEG recordings. We will use the Mazesuite Software (http://mazesuite.com/) for behavioural testing and the Fieldtrip toolbox Matlab (and where appropriate the SPM toolbox) for analysis of electrophysiological data. Good computer skills and at least rudimentary programing skills are essential.

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