



GUEST LECTURES

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>> Sleep-dependent formation of memory <<

Hosted by: Alexander Weuthen

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Hybrid

Building 22- Section A

Lecture Hall 2

OVGU

Universitätsplatz 2

39106 Magdeburg

OR

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Zoom Login

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Abstract

Whereas memories are optimally encoded and retrieved when the brain is awake, the consolidation and formation of long-term memory requires an offline mode of processing as optimally established only during sleep. Based on evidence from behavioral and neurobiological studies in humans and rodents, I will consider the formation of long-term memory during sleep as an “active systems consolidation” process in which the repeated neuronal replay of representations originating from the hippocampus during slow-wave sleep (SWS) leads to a gradual transformation and integration of representations in extrahippocampal, mainly neocortical networks. I will highlight three features of this process: (i) Hippocampal replay that, by capturing episodic memory aspects, drives consolidation of both hippocampus-dependent and non-hippocampus-dependent memory; (ii) brain oscillations hallmarking SWS and rapid-eye movement (REM) sleep, respectively, which provide mechanisms to regulate both information flow across distant brain networks and local synaptic plasticity; and (iii) qualitative transformations of memories during sleep-dependent systems consolidation resulting in abstract schema-like representations. Here, I will emphasize the importance of sleep for memory transformation during early development.

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