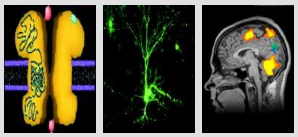

Molecular and Neural Correlates of Memory and Cognition

April 9 - 10, 2019 Veranstaltungszentrum, Ruhr University Bochum

Wednesday April 10, 9:15 – 12:00

Session 3 **Subcortical contributions to memory and cognition**

LAURA EWELL

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The impact of pathological high frequency oscillations on hippocampal network activity in rats with chronic epilepsy

Ripple oscillations in the hippocampus support memory consolidation processes and spatial path planning. In epilepsy, the hippocampus generates two types of oscillations: ripple-like and pathological. Here we characterize hippocampal dynamics during these two oscillation patterns by performing single unit recording in awake behaving animals. For each oscillation type we analyzed the spectral characteristics, brain state dependence, and cellular participants. Pathological oscillations occurred irrespective of brain state, were associated with interictal spikes, engaged distinct subnetworks of principal neurons compared to ripple-like events, increased the sparsity of network activity, and initiated both general and immediate disruptions in spatial information coding. In contrast, ripple-like oscillations had many characteristics similar to control ripple, suggesting some memory processes are maintained in epileptic networks, and that selective inhibition of pathological oscillations could be beneficial to hippocampal processing.