

Neural oscillations and communication between the Hippocampus and the neocortex

Francesco Battaglia

Universiteit van Amsterdam

A complex brain network, centered on the hippocampus, supports episodic memories throughout their lifetimes. Classically, upon memory encoding during active behavior, hippocampal activity is dominated by theta oscillations. During inactivity, hippocampal neurons burst synchronously, constituting sharp waves, which can propagate to other structures, theoretically supporting memory consolidation. This 'two-stage' model has been updated by new data from high-density electrophysiological recordings in animals that shed light on how information is encoded and exchanged between hippocampus and the neocortex and subcortical structures. I will present a general picture of the current state of the art on this topics and will give an update on recent results on 1) the effect of cortical sleep spindles on hippocampo-cortical communication and 2) Large scale cortical synchronization events (spanning most of the cerebral cortex) that are orchestrated by the cerebral cortex.