Seminar/Talk

Dissecting hippocampal circuits operations for navigation and learning

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Host:

Learning and remembering where and when salient events occur in space and time are essential for adaptive behaviors. Both spatial navigation and episodic memory have been linked to the mammalian hippocampus, but the detailed mechanisms at cellular and circuit levels remain poorly understood. To address these questions, we use in vivo functional imaging to monitor the activity of identified excitatory, inhibitory and neuromodulatory circuit motifs in the hippocampus of behaving mice during spatial exploration, fear learning and goal-directed learning. The talk will focus on our recent efforts aimed at dissecting functional roles of multimodal microcircuits at the dentate gyrus input and at the CA1 output nodes of the hippocampus. I will summarize how various types of dentate gyrus principal neurons adult-born and mature granule cells, and hilar mossy cells contribute to context encoding and discrimination. We also monitored activity in deep and superficial subpopulations of CA1 pyramidal cells, and assessed the relationship between sublayer dynamics and learning. Finally, I will present findings on how goal-oriented learning is supported by disinhibitory GABAergic circuits in CA1. Together, our results demonstrate a functional division of labor among subpopulations of principal neurons during hippocampal-dependent behaviors.

Monday, April 3, 2017 10:15am - 11:15am

Mondi Seminar Room 2, Central Building

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