

Understanding the Role of Hippocampus in Space, Memory & Disease

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Abstract

The hippocampus plays a critical role in memory and its dysfunction underlies conditions such as epilepsy, intellectual disability and dementia. In rodents genetic techniques allow specific access to discrete populations of neurons, both within the hippocampus and in areas projecting to it, permitting the manipulation of neuronal transmission and plasticity on a variety of timescales. The combination of these tools with behavior and *in vivo* physiology have allowed a greater understanding of how information is processed in the structure. In this talk I will first discuss some convergent data from the lab highlighting the importance of the balance between finely tuned inhibition and excitation in the hippocampus and how perturbations to this balance are evident in disease models. I will then highlight recent experiments designed to understand the link between the place cell activity and episodic memory.