



Beyond inhibition: how GABAergic neurons shape hippocampal assemblies

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During development, spontaneous hippocampal dynamics are tightly correlated to sensorimotor inputs and highly coordinated among most neurons through the action of GABA hub cells (Bonifazi et al. 2009, Picardo et al. 2012). In contrast, internal dynamics are a strong organizing factor in the adult hippocampus and spontaneous activity is dominated by a sparse, but stable subset of active neurons organized in functionally orthogonal “assemblies” (Malvache et al. 2016). In sum, there is both an internalization and a sparsification of hippocampal dynamics as development proceeds with the emergence of basic functional modules in the form of hippocampal assemblies. Here I will present work from the lab indicating that both processes likely rely on the contribution of specific GABAergic circuits. I will also show how single GABA neurons impact the organization of sequences and assemblies in the adult CA1 region of the hippocampus. This work will use a combination of experimental approaches, including all-optical probing of hippocampal circuits in vivo.