

How does inhibition support memory? Hannah Monyer

Although GABAergic neurons account for only 15 to 25% of neurons in the brain, they play a major role for the generation of the simplest sensory representations, but also of complex cognitive processes such as learning and memory. Reason why GABAergic neurons are so important in these processes is because they control, i.e. time the activity of neurons within neuronal networks. The concerted synchronous action at the millisecond scale is a prerequisite for the generation of any bottom-up or top-down representation in the brain. In my lab we use mouse genetics to modify the activity of GABAergic neurons and study how local and long-range synchrony is achieved and what it is good for. We concentrate on brain structures such as the hippocampus and entorhinal cortex that support episodic memory not only in rodents but also in humans. We study mostly spatial memory and seek to understand how molecular/cellular mechanisms determine network properties and ultimately behavior. I will give examples to illustrate current techniques that we, and others use to address complex questions such as spatial learning and memory, focusing on GABAergic neurons. Advantages and shortcomings should become apparent and constitute the basis of subsequent discussion.