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Self-inhibiting neurons in the neocortex

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ABSTRACT OF THE TALK

In the mammalian brain, the neocortex is the site where sensory information is integrated into complex cognitive functions. This is accomplished by patterned activity of both principal glutamatergic neurons and locally-projecting inhibitory GABAergic interneurons, interconnected in complex networks. Our previous studies revealed that cortical interneurons can generate powerful self-inhibition through autaptic transmission i.e. through synapses that a neuron makes onto themselves. This form of feedback inhibition is important in dictating the spike timing of autaptic cortical interneurons thus promoting synchronous activity. Additionally, we found that autaptic transmission can generate a prominent, delayed and prolonged self-inhibition through asynchronous release of GABA in response to sustained activity. Mechanisms and functional relevance these forms of cortical neuron self-inhibitions will be presented.