# TIFR Centre for Interdisciplinary Sciences, Narsingi, Hyderabad 500075

## Seminar

# Molecular determinants of synaptic transmission on to hippocampal parvalbumin interneurons


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Synaptic transmission (excitation and inhibition) is fundamental to information processing within neuronal networks, and is primarily brought about by the precise activity of the different cell types within the network. Synaptic excitation and inhibition are mediated by two different neurotransmitters- glutamate and γ-amino butyric acid (GABA) at excitatory synapses and inhibitory synapses respectively. These transmitters are released by two different types of neurons in the brain- excitatory principal cells and inhibitory interneurons. Research over the past 25 years culminated in a better understanding of the molecular composition of the excitatory synapses on principal cells. However, properties of excitatory synapses, as well as their morphology is different between principal cells and interneurons. A detailed molecular understanding of the structure and the functioning of excitatory synapses on interneurons, akin to the principal cells is lacking. This leaves a gap in understanding the function of these cells and their role in neuropsychiatric diseases.

In this seminar, I will focus on the role of a synaptic cell adhesion molecule, neuroligin-3 (NL3) in maintaining synaptic transmission at excitatory synapses onto a specific class of interneurons (Parvalbumin interneurons, PV) in the CA1 region of the hippocampus, a region of the brain intimately involved in the generation of autobiographical memories. Upon deletion of NL3 specifically from the PV cells, synaptic transmission through postsynaptic N-methyl-D-aspartate receptors (NMDAR) was reduced. Surprisingly, In addition to its postsynaptic role, deletion of NL3 also led to a change in the pre-synaptic glutamate release probability at these synapses.


***Friday, Dec 27th 2013***

***2:00 PM (Tea/Coffee at 1:45 PM)***

***Seminar Hall, TCIS***