

Neuroscience Center of Excellence

Special Seminar in Neuroscience

**Linking Spatial Disorder to
Temporal Order: How Inhibitory
Neurons Influence Dynamics
Within *in vitro* Networks**

How is the network temporal structure altered when the balance between excitation and inhibition is changed? Proper balance is essential for normal brain function, including cognitive processing, the representation of sensory information and motor control. When the balance is compromised, neurological disorders may result. We use a simple reduced experimental system to investigate how manipulating the number of inhibitory neurons in a network of cultured hippocampal neurons affects synchronized bursting activity, the most prominent temporal signature of cultured hippocampal networks. Inhibitory neurons are thought to control spike timing and modulate network excitability and the absence of which may lead to widespread synchronization. We culture dissociated hippocampal neurons with varying densities of inhibitory neurons on an 8x8 grid of extracellular electrodes and study how inhibitory neurons modulate network temporal dynamics. We show that as the proportion of inhibitory neurons increase, there is a dramatic change to the temporal pattern.



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**12:00 p.m.
April 4, 2011**

8th Floor

**Neuroscience Center
of Excellence
Conference Room**

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