

When: Friday 13:50 – 14:50

Where: ETB 1035

Speaker: Woo Seok Kim & Ruida Liu

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Title: IMPLANTABLE IN VIVO OPTOGENETIC STIMULATION & WIRELESS
NEURAL SIGNAL RECORDING

Date: 4-20-2018

Abstract: Optogenetic, which is one of the most powerful genetic tool that was invented within decade, enables interrogation of neural functions by targeted gene expression and activation of light sensitive protein. A growing number of scientists are using this emerging technique to better understand how groups of interconnected neurons work together to carry out discrete function. Implementation typically requires remote light sources and optical fiber deliver scheme. Although this experimental approach has some utility, physical tethering hamper natural behaviors of an animal in a cage and limits targetable circuits to the brain. Soft, miniaturized wireless electronic can provide a unique biocompatible platform for wireless delivery of light to targeted regions in the brain and/ or nervous systems. Here, we present an adaptive miniaturized wireless platform electronic that can control soft neural interfaces and integrated data transmission, signal processing, and power management. This closed loop system allows safe, precision modulation of neural circuits. To evaluate utilities in studies of obesity, we use animal models; multimodal neural probes directly interface with vagus nerves that projects from the gut to the NTS in the hindbrain and wireless electronic devices deliver optical stimulation and record from vagus nerves in awake animals. Such efforts will yield complete understanding of how the energy homeostasis system works and research outcome will be identification of neural circuits involved in feeding that treat obesity.