Seminar/Talk

Elucidating the molecular mechanisms that regulate voltage gated calcium channel subtypes levels and organization in the presynaptic terminal

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Host: Peter Jonas

In mammalian central nervous system synapses, the voltage-gated CaV2 Ca2+ channels, CaV2.1, CaV2.2, and CaV2.3 are the major source of Ca2+ entry for neurotransmitter release. Due to the steep Ca2+ dependence of neurotransmitter release, the number of functional CaV2 channels and their proximity to synaptic vesicles (SVs) are key determinants of the strength and kinetics of neurotransmitter release that help define neural circuit output. Furthermore, developmental variations in these parameters can help refine information encoding by the neuronal circuit. However, we know little about the molecular mechanisms that regulate these CaV2 channel properties at the synapse and throughout development. To elucidate these mechanisms, we are taking a systematic approach and utilizing transgenic mouse models and novel viral vectors to manipulate Cav2 subtypes in vivo at the calyx of Held presynaptic terminal during different developmental stages in combination with analysis using electrophysiology and electron microscopy (EM) methods. In this talk, I will present our recent results on the regulation of Cav2 subtype levels and their proximity to SVs in the presynaptic terminal, as well as their impact on synaptic transmission.

Tuesday, March 27, 2018 01:00pm - 02:00pm
Seminar Room, Lab Building East

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