Title: Entropic Force Theory Predicts Spontaneous Synaptic Release in Normal and Alzheimer's Disease States

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In this talk, the speaker will present how an entropic force theory model framework can be used to understand presynaptic spontaneous release frequency. We will present experimental data supporting the entropic force framework using a combination of electron microscopy, fluorescence microscopy, and computational modeling. Using cultured primary hippocampal neurons as an experimental model system, this talk will show how neurotransmitter carrying synaptic vesicle density is the main mediating factor in determining spontaneous release frequency by acutely modifying vesicle density with Forskolin. The entropic force model will then be used to predict experimentally measured changes in spontaneous release frequency in different mouse models of tauopathy and amyloid beta. Finally, the talk will discuss the potential for using entropic force theory to predict how synaptic transmission is maintained as well as modified during plasticity.