UIC COLLOQUIUM
Department of Physics

Wednesday, December 12, 2018

"Single Molecule Fluorescence Reveals Dynamic Structures of Synaptic Protein Assemblies"

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Proteins govern virtually every process inside the cell, making them central to cellular function. Although high-resolution atomic structures are known for many proteins, relating a single static structure to its function is difficult. Proteins have dynamic characters changing shape every moment, affecting the structure and the function of the molecule. It is of interest to many structural biologists to watch protein in action, which requires monitoring protein motion in real time. The application of fluorescence at the single molecule level allowed this to be possible, where molecular heterogeneity, transient intermediates, rare events, and the sequence of events are detected. By using single molecule Fluorescence Resonance Energy Transfer (smFRET) we uncovered new intermediate pathways of pre synaptic neuronal SNARE proteins, regulators for fast Ca2+ triggered neurotransmitter release, which was impossible to monitor using other ensemble techniques. Additionally by combining with single vesicle content mixing assay we discovered that a brain specific protein Munc13 can proof read and properly assemble the SNARE complex to increase the Ca2+ triggered fusion efficiency.

The Department of Physics Colloquium will be held at 2pm in 2214 SES.