校青年科协学术沙龙（线上会议）第 9 期

沙龙主题：The Development of Nanoscale Tools for Single Molecule Studies

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报告人简介：

Jin He, received Bachelor's degree in physics from Fudan University, a Ph.D degree in biophysics (2005) from Arizona State University and two-years postdoc on single molecule biophysics. He was appointed as an assistant professor in Physics at Florida International University in 2011. His research aims to develop novel single molecule/single cell techniques for the fundamental understanding of important biology problems. He has received several early-career awards, including of the NSF CAREER Award, FIU Top Scholar and FIU Faculty summer research Award. He also is member of American Physics Society, Biophysical Society and American Chemistry Society. His researches have been published on several top journals with 4500 cites, such as *Science*, *Nat nanotechnol.*, *J. Am. Chem. Soc.*, *ACS Nano*, *Nano Lett.*, etc.

Abstract: Measurements at the single-molecule level can reveal the dynamics, stochastics, and heterogeneity of molecules. In recent years, various electrochemical single-entity (SEE) techniques have been developed and show increased importance in fundamental research and applications. Integrated approaches of these techniques can effectively improve the sensitivity and selectivity of single-entity methods. In this talk, I will show a few examples of our work in developing new SEE based methods towards single-molecule analysis and detection. In the plasmonic molecular junction formed by the collision events between gold nanoparticle (NP) and gold nanoelectrode, we studied

chemical reactions and interactions at single-molecule level using surface enhanced Raman spectroscopy (SERS). Using a nanopipette with both nanopore and nanoelectrode at the apex, we can achieve single-molecule detection of proteins with high sensitivity and high event rate. The nanopipette has also been used for intracellular delivery and single-molecule counter for NPs and proteins.

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