# Juan Guan (University of Florida)


# Seeing Is Believing: Self-Assembly of Protein Condensates Enhances Cancer Signaling


Abstract:

Decades of biophysics theories have developed from experimental observations which were often based on indirect ensemble-averaged and low-resolution measurements. In this talk, I will demonstrate direct imaging with high spatiotemporal resolution to reveal the inner life of cells. I will show an intriguing discovery of how the self-assembly of certain proteins is both necessary and sufficient to promote a model case of cancer signaling. Through a combination of systematic analysis of large-scale cancer mutation database and high-throughput imaging, we find this is a general principle underlying a variety of protein condensate assemblies. Departing from the textbook view that signaling is mediated from the cell membrane, this novel cancer mechanism via protein phase separation serves as a paradigm shift in how we think of self-assembly mechanisms and biophysical impact of protein condensates.


Short bio:

Dr. Guan did her Ph.D. at University of Illinois Urbana Champaign and she pioneered the study of direct imaging of polymer dynamics at monomer level using bio-inspired polymers. Her work has provided novel insight into entangled polymer dynamics in equilibrium and driven transport and Fickian yet non-Gaussian processes in simple colloid systems. In her postdoctoral training at University of California San Francisco, Dr. Guan has combined her quantitative imaging and cell biology background to study a variety of biological systems including genome imaging and endogenous protein tagging with genome editing. She joined University of Florida Physics in 2020. Her most recent discovery of a surprising link between cancer and protein phase separation highlights how the biophysical states can have profound impact in biological systems.