

Embracing Asymmetry: Designing Janus Interfaces to Image and Control Cellular Dynamics

Yan Yu

Assistant Professor, Department of Chemistry, Indiana University-Bloomington

A cell is like a bustling city. Dynamics on various length and time scales, from receptor clustering and enzyme diffusion to vesicle trafficking, control how cells communicate and make decisions. In spite of the known significance of cellular dynamics, approaches to quantify these dynamics and to dissect their specific roles in cell functions are limited. In this talk, I will present my lab's research progress towards designing unique biointerfaces to enable the imaging and manipulation of live cells at high spatiotemporal resolution. Our research so far has capitalized on Janus particles, particles that have two "faces" like the Roman god Janus. I will show in the talk how the distinct chemistries on the surface of a single Janus particle allow us to manipulate immune cell functions, from phagocytosis to T cell stimulation, and to probe cellular dynamics in multi-dimensions beyond translation motion.

Bio:

Yan Yu received her B.S. in Chemistry from Peking University (Beijing, China) in 2004. She pursued her Ph.D. degree in the Department of Materials Science and Engineering at the University of Illinois-Urbana Champaign from 2004 to 2009 under the direction of Professor Steve Granick. Subsequently, she started her postdoctoral research at the University of California at Berkeley with Professor Jay T. Groves and changed her research direction to immune cell biophysics. She joined the faculty at Indiana University as a tenure-track assistant professor in July 2012.