

UC SAN DIEGO NANOENGINEERING SEMINAR

Wednesday, February 21 2018

Seminar Presentation: 11:00am - 12:00pm

ASML Conference Center (SME 248)

“Surprises at Janus Particle-Bio Interfaces: From Membrane Biophysics to Immunomodulation”

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Abstract: The immune system functions on the basis of intricately organized chemical reactions and physical forces. Examples range from the engulfment of invading bacteria that relies on a fine balance of competing mechanical forces, to the activation of T-lymphocytes that requires collective interactions between thousands of receptors at the junction between cells. Owing to the complexity of these processes, understanding immune functions using traditional biological tools is highly challenging. In this talk, I will present my group’s research progress towards designing unique biointerfaces to enable the quantitative understanding and manipulation of immune functions. Our research so far has capitalized on Janus particles, which, like the two-faced Roman god Janus, are made chemically, biologically, optically or magnetically asymmetric. We developed Janus particle-based toolsets for measuring and controlling cell functions in multi-dimensions beyond translation motion. Using these methods, we uncovered new dynamics and mechanisms in immune processes, from phagocytosis to intracellular trafficking, which would otherwise be difficult to access with traditional means.

Biosketch: Prof. Yan Yu is an Assistant Professor in the Department of Chemistry at Indiana University Bloomington. She received her B.S. in Chemistry from Peking University (Beijing, China) in 2004, and Ph.D. in Materials Science and Engineering at the University of Illinois-Urbana Champaign in 2009 under the direction of Prof. Steve Granick. She completed her postdoctoral training with Prof. Jay T. Groves at the University of California at Berkeley from 2009 to 2012. Since starting her independent career in July 2012, Prof. Yan Yu has received several awards, including the NSF CAREER award (2016), the Cottrell Scholar Award from the Research Corporation for Science Advancement (2016), the Alfred P. Sloan Fellowship (2017), and the NIH Maximizing Investigators’ Research Award (2017).