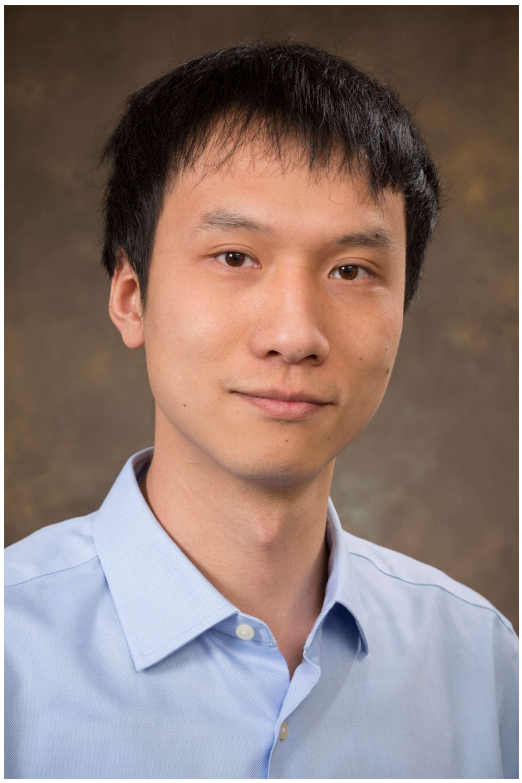

DR. CHENXIANG LIN

Department of Cell Biology,
Yale University, New Haven, CT

"DNA NANOTECHNOLOGY ENABLED MEMBRANE ENGINEERING"

February 28, 2020 ~ 11:30AM
Life Science Center II, Room 130

SPRING 2020 CHEMISTRY SEMINAR SERIES

HOST: DR. ZHANG

COFFEE SOCIAL 11:00 AM OLSON HALL, 338

ALL THOSE INTERESTED ARE WELCOME TO ATTEND

Abstract: Lipid-bilayer membranes form barriers to define the boundaries of a cell and its subcellular compartments. They undergo modulated structural changes and mediate biochemical reactions to sustain the cell's life cycle. Inspired by such elegance in nature, engineers and biologists have aspired to build artificial membranes to recapitulate the cellular membrane structure and dynamics. Such in vitro preparations provide a complexity-reduced system for the study of functional interactions between membranes and their associating molecules. Here I present our technical innovations in programmable, high-precision membrane engineering. Our general approach is to use self-assembled DNA nanostructures as templates to guide the assembly of lipid bilayers and transduce the programmable feature of the DNA nanostructures to the templated vesicles (Yang et al, Nat Chem 2016). We show the assembly, arrangement, and remodeling of liposomes with designer geometry, all of which are exquisitely controlled by a set of modular, reconfigurable DNA nanocages, giving rise to membrane curvatures present in cells yet previously difficult to construct in test tubes (Zhang et al, Nat Chem 2017). Incorporating membrane-interacting proteins into these DNA-templated liposomes allows us to systematically study protein-mediated membrane dynamics, such as SNARE-mediated membrane fusion (Xu et al, JACS 2016) and extended synaptotagmin-mediated lipid transfer (Bian et al, Nat Chem Biol 2019).

RUTGERS UNIVERSITY | NEWARK

Department of Chemistry
73 Warren Street, Olson Hall
Newark, New Jersey
https://sasn.rutgers.edu/chemistry