NIH T32 Career Colloquium

Wednesday, December 8, 12 pm

140 Hutchison Hall, Lander Auditorium — Zoom Link also available

Sreyoshi Sur

Scientist, Computational Chemistry
Moderna

"Ionizable Lipids Modulate Lipid Nanoparticle Surface Based on Microenvironment pH"

Abstract: Moderna's mRNA technology is a potent platform for rapid development and effective delivery of vaccines and human therapeutics. A core element of Moderna's technology is the use of lipid nanoparticles (LNPs) to deliver mRNA to cells, which then translate the mRNA into the desired antigen or therapeutic protein. LNPs are composed of phospholipids, ionizable lipids and sterols, and the interaction between these components plays an important role in defining LNP surface properties. In this study, we hypothesize that pH and the proportions of ionizable lipids impact the lipid-lipid interactions on the surface of the LNP. Using coarse-grained molecular dynamics simulations, we observe that the stability and order parameters of the phospholipids are sensitive to pH, and that the degree of sterol presentation on the LNP surface can be tuned with different proportions of ionizable lipids. Previously published cryo-EM experiments support these findings. Understanding lipid-lipid interactions can help us gain insights on the lipid self-assembly to inform future LNP formulation design.

Sreyoshi will also be talking about her transition from academia to the biotech industry.

Zoom: https://rochester.zoom.us/j/96148854781

Website: https://events.rochester.edu/event/chemistry_colloquium_sur

Host: Professor Kara Bren • Email: bren@chem.rochester.edu