Our group works on theoretically understanding the complex structural and dynamic behaviors of soft matter systems. Soft matters constitute the basic components of living systems and are a critical component of materials that could meet the emergent requirements of sectors like environment, energy, and medicine. Modeling complex soft matter systems with multiple components, interactions and length/time scales poses great challenges. We build detailed computational tools using statistical mechanics and computer simulations to model the physical insights behind the complex behaviors shown by these systems. We collaborate closely with experimentalists for rational design of new materials for antifouling membranes, batteries, stimuli-responsive gels, and biomedical materials.