Liner and non-linear microrheology of phospholipid monolayers at the air-water interface

김규한†
서울과학기술대학교
(kyuhankim@seoultech.ac.kr†)

Phospholipids have been known to be the major component of cell membranes and lung surfactants in our body. Among these, we are especially interested in the lung surfactant (LS), which can be found at the air-fluid interface of lung alveoli and lowers the interfacial tension so that a respiration can be easily possible. In particular, it has been reported that rheological properties of lung surfactant monolayers, such as the viscosity and elasticity, are very important for their stability and functions. Accordingly, in this presentation, we would like to report the linear and nonlinear rheological properties (e.g. viscosity, elasticity, and yield stress, etc.) of phospholipid monolayers at the air-water interface, and relate them to dynamics of the surfactant microstructure. We use interfacial microrheology, fluorescence microscopy, and atomic force microscopy (AFM) to investigate the rheological properties and microstructure of surfactant monolayers, and as a result, we finally show the dramatic change of these dynamic properties and microstructures, depending on the degree of surface pressure, the concentration of cholesterol, and the enantiomeric excess, etc.