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Interaction of Complex Liquids with Lipid Biomembranes

BENXIN JING, Y. ELAINE ZHU, Department of Chemical and Biomolecular Engineering, University of Notre Dame, Notre Dame, Indiana 46556, United States — With the emerging of smart molecular probes and functional nanocolloids for various biomedical applications, it becomes critical to understand the interaction of complex liquids with cell biomembranes in order to effectively use them with minimal cytotoxicity. Deciphered mainly by fluorescence imaging and fluorescence correlation spectroscopy, this poster will emphasize some recent studies in our group of how ionic liquids, macroionic nanoclusters, and nanocolloids interact with cell biomembrane. Using lipid bilayers as model biomembranes, I will show that adsorbed molecules and nanocolloids can not only disrupt the morphology of lipid bilayers, but also induce their phase transition due to sufficiently strong electrostatic attraction. With ionic liquids and macroionic nanoclusters whose dimensions are comparable to lipids, intriguing supramolecular assembly is also observed at lipid bilayer interface, showing a strong dependence on the chemical makeup of adsorbed ionic species.

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