

Abstract Submitted
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Lipid Biomembrane in Ionic Liquids¹ BRIAN YOO, BENXIN JING, JINDAL SHAH, ED MAGINN², Y. ELAINE ZHU, Univ of Notre Dame, DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING TEAM — Ionic liquids (ILs) have been recently explored as new “green” chemicals in several chemical and biomedical processes. In our pursuit of understanding their toxicities towards aquatic and terrestrial organisms, we have examined the IL interaction with lipid bilayers as model cell membranes. Experimentally by fluorescence microscopy, we have directly observed the disruption of lipid bilayer by added ILs. Depending on the concentration, alkyl chain length, and anion hydrophobicity of ILs, the interaction of ILs with lipid bilayers leads to the formation of micelles, fibrils, and multi-lamellar vesicles for IL-lipid complexes. By MD computer simulations, we have confirmed the insertion of ILs into lipid bilayers to modify the spatial organization of lipids in the membrane. The combined experimental and simulation results correlate well with the bioassay results of IL-induced suppression in bacteria growth, thereby suggesting a possible mechanism behind the IL toxicity.

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