

## Effect of imidazolium-based ionic liquids on the structure and dynamics of cellular membrane: From model to mammalian membranes

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Ionic liquids (ILs) have attracted considerable attention because of their wide range of potential applications. They exhibit antimicrobial activity and control the growth of some cancerous cells. It has been proposed that these activities of the IL-molecules are related to the adverse effects on the self-assembled structures of cellular membrane. In our study, the free energy of IL-lipid interaction is found to be spontaneous [1]. The self-assembled structure of lipid bilayer on a polymer support is perturbed which is evident from synchrotron x-ray reflectivity (XRR) studies [2]. The thickness of lipid bilayer reduces considerably and the corresponding electron density of the layer increases. The nature of the interaction depends on the hydrophobicity of the ILs and on the overall electrostatics of the system. The neutron scattering studies exhibit the dynamics of the lipid molecules in a vesicle system [3]. Further, the morphology of the cellular membrane of some mammalian cancerous cell obtained from atomic force microscopy (AFM) manifests the pore formation in the membrane. All these results suggest the ionic liquids to destroy the self-assembled structure of cellular membrane, which is, probably, the cause of cell death.

### References:

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