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Lysozyme effect on structural state of model membranes as revealed by pyrene excimerization studies

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Abstract

Steady-state measurements of pyrene fluorescence in the model bilayer membranes composed of phosphatidylcholine (PC) and its mixtures with cardiolipin (CL) have been performed to gain insight into the effect of lysozyme on molecular organization of lipid bilayer. Analysis of vibronic structure of the probe emission spectra revealed no changes in transverse distribution of pyrene monomers on varying CL contents or increasing the extent of lysozyme binding to liposomes. Excimer-to-monomer fluorescence intensity ratio has been found to reduce on lysozyme association with lipids. The magnitude of this effect increased with increasing CL content from 0 to 40 mol%. These results have been interpreted as indicating decrease in the membrane free volume on formation of both electrostatic and hydrophobic protein–lipid contacts.

Keywords: Lysozyme–lipid interactions; Pyrene excimer formation; Bilayer free volume