



Chlorpromazine-membrane interactions as revealed by pK_a and fluorescent probes

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The effect of the cationic drug chlorpromazine (CPZ) on the structural state and physico-chemical properties of model lipid membranes composed of the zwitterionic phospholipid phosphatidylcholine (PC) and the anionic phospholipid cardiolipin (CL) at molar ratios 19:1, 9:1 and 4:1 has been investigated using the pK_a probe Neutral Red (NR) and the fluorescent membrane probes pyrene and 1,6-diphenyl-1,3,5-hexatriene (DPH). CPZ incorporation into the PC:CL lipid bilayers was followed by an increase of the NR partition coefficients. This effect was interpreted in terms of drug-induced enhancement of membrane hydration and alterations in headgroup molecular packing. Analysis of pyrene excimerization and DPH anisotropy data provided further evidence for the ability of CPZ to promote bilayer condensation.

Keywords: chlorpromazine, DPH, lipid bilayer, pK_a probes, pyrene