SPECTROSCOPIC STUDIES OF THE INTERACTION BETWEEN PYRIMETHAMINE AND PHOSPHOLIPID VESICLES AS MODEL OF BIOLOGICAL MEMBRANES

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The biomembranes are extremely complex structures. Aiming to understand the interaction of drugs with these systems is common to use model systems as phospholipids vesicles (lipossomes). In this work we studied the interaction of Pyrimethamine (PIR) an anti-toxoplasmosis drug with lipossomes of dipalmitoylphosphatidylcholine (DPPC), dipalmitoylphosphatidylglycerol (DPPG), and mixtures of them by fluorescence spectroscopy of the drug. Binding constants (K_b) were determined both below and above the phase transition temperature of the lipids, in different pH values (4.0, 7.0 and 9.0).These constants at pH 7.0 were 570 M^{-1} (25ºC) and 640 M^{-1} (45ºC) for pure DDPC, and 1620 M^{-1} (25ºC) and 5590 M^{-1} (45ºC) for pure DDPG. At pH 4.0 the association constants showed different behavior, K_b values decreased by a factor of 3 for DPPC at 45ºC and a factor 7 at 25ºC but increased for DPPG due to the electrostatic interaction of the protonated drug with the phospholipid headgroup. At pH 9.0 the K_b values were quite similar for that at pH 7.0 for DPPC and very low for DPPG. In the mixed system formed by DPPC and DPPG (10% and 20%) the resulting variations in the mixture compositions have a marked effect on drug-vesicle interaction, a decrease of the association constants was observed consistent with a more tightly packed bilayer.

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