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Antimicrobial activity of *N*-acylphenothiazines and their influence on lipid model membranes and erythrocyte membranes.

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The antibacterial activity and influence on lipid model membranes and erythrocyte membranes of 24 *N*-acylphenothiazines and trifluoperazine were studied. Among 24 phenothiazines, the antimicrobial activity of amino maleates was the highest. The influence of phenothiazines on model liposome and erythrocyte membranes was studied using *N*-phenyl-1-naphthylamine (NPN) as fluorescence probe. From the three types of phenothiazine substitution (H, Cl, CF_3) at position 2, CF_3-phenothiazines were the most effective in the interaction with liposomal membranes. As measured by the polarization degree of 1,6-diphenyl-1,3,5-hexatriene (DPH) fluorescence, the alteration of membrane fluidity induced by CF_3-phenothiazines was the biggest. Surprisingly, phenothiazines induced stomatocytic shape alterations (invaginations) in erythrocytes and at higher concentrations, also hemolysis of erythrocytes was observed. The microcalorimetic measurements of influence of phenothiazines on thermal behaviour of synthetic lipid systems confirmed the previously obtained results. The main transition temperature and enthalpy of transition of 1,2-dipalmitoyl-*sn*-glycero-3-phosphatidylcholine (DPPC) were significantly modified by CF_3-phenothiazines, suggesting their penetration of the lipid bilayer. Above results show that phenothiazine maleates were generally more effective than other phenothiazines used in this study.