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Differences and similarities in the influence of trifluoperazine on the phase transitions of phosphatidylcholine and phosphatidylethanolamine

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Influence of trifluoperazine, phenothiazine derivative known to reverse multidrug resistance of cancer cells, on the thermal properties of dimyristoylphosphatidylcholine and dimyristoylphosphatidyl-ethanolamine was studied by means of microcalorimetry. Main phase transition of both lipids was affected by the drug in a concentrationdependent manner. In case of dimyristoylphosphatidylcholine we observed additionally the effect of trifluoperazineinduced phase separation. This phenomenon was observed for drug/lipid molar ratios higher than 0.06. From the experimental results we conclude that trifluoperazine incorporates into both dimyristoylphosphatidylcholine and dimyristoylphosphatidyl- ethanolamine bilayers. The phase separation is presumably induced by the different mode of drug-bilayer interactions of protonated and unprotonated form of trifluoperazine. Only phosphatidylcholine, which polar heads are not so densely packed in bilayer as phosphatidylethanolamine ones, is able to distinguish between the different protonation forms of trifluoperazine.