THE KINETICS OF CHANGE IN THE FLUIDITY OF LIPOSOMES ADMIXTURED WITH METALLOPORPHYRINS: AN ESR STUDY

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The kinetics of change in the fluidity of liposome membranes admixtured with metalloporphyrins was investigated. The liposomes were obtained in the process of sonication of egg yolk lecithin (EYL). There were 3 metalloporphyrins chosen for the investigation: PMg, PCo and PNi. The concentrations of the investigated compounds in relation to EYL amounted to 2%. The technique of electron paramagnetic resonance (ESR) was used in the research, with two spin probes differing from each other as far as their location in the membrane was concerned. TEMPO probe dissolves both in the hydrophobic part of membranes and in water environment, while 16-DOXYL-stearic acid one locates itself deep in the hydrophobic membrane. The spectroscopic spectra were registered from the moment of introducing the admixture into liposomes during the successive 120 hours. Upon an analysis of the obtained results the following conclusions can be drawn: the porphyrins investigated for the purpose of the present work, fluidized the liposome membranes to an increasingly greater extent with time. It was found out that the dynamics of the process depended on the type of porphyrins and the area of the membrane penetrated by the spin probes. The TEMPO probe revealed that the membrane was fluidized to the greatest degree by PCo porphyrin, whereas PMg one – to the lowest extent. In the case of the 16-DOXYL-stearic acid probe there were no significant differences observed in the changes of spectroscopic parameter for the investigated porphyrins. All the investigated porphyrins fluidized the liposome membrane to a similar degree, and the τ parameter changed only insignificantly with time.

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