Abstract

The presented thesis is a continuation of the bachelor work, in which the effects of monovalent ions on neutral model lipid membranes were characterized. Herein physical properties of physiologically relevant anionic membranes in the presence of monovalent cations and oxidized lipids were studied. Hydration and mobility of the lipid bilayer at glycerol level were investigated using fluorescent solvent relaxation technique.

In the first part of this work the interactions of cations (Na^+, K^+, Cs^+) with negatively charged POPC/POPS lipid mixture, which is a good model of inner leaflet of cellular membrane, were studied. The presence of cations resulted in dehydration and substantial hinderence of mobility of hydrated lipids at the glycerol level probed by Laurdan. Clear specificity of those effects, which correlated with Hofmeister series have been observed.

In the second part of the work truncated oxidized phospholipids, oxPLs (PazePC, PoxnoPC, PGPC, POVPC), which are known to be important in pathophysiology of numerous diseases, were investigated. 10 mol% of each oxPL was incorporated into neutral and anionic lipid bilayers, the hydration and mobility of which were measured in water or in KCl solution. The results reveal complex interactions between oxPLs, negatively charged lipids, and K^+. In the majority of cases the presence of oxPLs resulted in enhanced hydration of the mixed POPC/POPS bilayer and the increased mobility at the glycerol level.