

## THE MODEL OF ICHFAN ACTIONS ON THE ERYTHROCYTES MEMBRANES UPON THE WIDE DIAPASON OF CONCENTRATIONS

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Hybrid antioxidants (HA) ichfans are the derivative of phenozan [1- $\beta$ -4-oxy- (3,5-ditertbutyl-phenyl) potassium propionate] with a saturated fatty acid tail and choline's residuum. For the investigation of HA action mechanism on the biological membranes we provided the experiments with the erythrocytes, and their ghosts. We tested two parameters of membrane structure: temperature transitions of cytoskeletal protein domains (by the method of differential adiabatic microcalorimetry) and microviscosity of surface and deep sites (by EPR-spectroscopy). We tested functional activity by recording of the Ca<sup>2+</sup>-K<sup>+</sup>-channels activity. We obtain the bimodal type of action with the middle silent zone at the wide concentration diapason of HA. HA at high doses 10<sup>-5</sup> M, 10<sup>-6</sup> M affected on the membrane structure (with the changes of microviscosity and the thermograms profiles) and at the membrane functions (Ca<sup>2+</sup>-K<sup>+</sup>-channels), without any cell destructions (tested by the erythrocyte hemolysis). At the super low dose 10<sup>-14</sup> – 10<sup>-16</sup> M HA had some influence on microviscosity and the Ca<sup>2+</sup>-K<sup>+</sup>-channels. At the middle doses doesn't exert some effects. It is in accordance with the new widely discussed model of actions of biologically active substances to the membrane upon the wide concentration range. We supposed, that our date are the reflections of the HA capacity for the formation of different types of molecular aggregates. Probably, amphiphils at the wide diapason of concentrations can be converted from classical micelles to the supramolecular structures. By this, the mechanism of "amphiphil – membranes interactions" must be changed drastically along the amphiphil's concentration decreasing. Under the high concentrations of substances, the multitude of classical micelles, which charged parts looked into water and nonpolar parts, that masked into interior space of vesicle, must be fused to membrane for the contact. At this case, amphiphils integrated to the membrane. Its dissolved with membrane lipids, loosen or rigidized the bilayer, or its formed own phase, that followed with drastically disturbing membrane integrity. Any specific effects must be absent. Under the middle concentrations all quality of amphiphils must be collected to small number of micelles, and the probability of collisions between micelles and membranes sharply decreasing. So we have the effect of "silent zone" without any relationships "amphiphil – membranes". And only upon the low and superlow concentrations the relationships "amphiphil – membranes" gain in importance of specificity. The tested substances have any effects only at its specific target. At this case the supramolecular polymer structure can be formed conjointly with water. The size, properties and reaction capability of this structure can be changed non-monotone in depending of concentrations of tested substances.