

SOME DISCUSSION ASPECTS OF THE PHENOMENON OF BIOLOGICAL ACTIVE SUBSTANCES ACTIONS UNDER SMALL AND ULTRASMALL CONCENTRATIONS

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This work deals with biology active substances (BAS): phenocsan – potassium salt of antioxidant phenozan(- β - (4-hydroxy-3 ,5-di-tert-butylphenyl) propionic acid), phenozan derivative – hybrid antioxidant ICHFAN-C-10 (charged onium group and a lipophilic long-chain alkyl tail in molecules of IHFANs allowed them to interact effectively with a charged lipid bilayer of cell membranes and maintain the antioxidant status), and plant growth regulator – Melafen (melamine salt of bis (hydroxymethyl) phosphinic acid). The influence of this BAS to the model and animal cell membranes, and soluble protein greatly change the structural and functional properties of these objects. These effects were investigated at a number our works early. We tested BAS under the wide concentration region (10^{-21} M – 10^{-3} M). It was being obtained, that all these BAS had the polymodal or bimodal concentration-dependent curves for its effects to the experimental objects parameters. Explanation for the reasons of these phenomenons is very questionable now. Are likely, the aqueous solutions or emulsion of BAS varied structurally in different concentration ranges. Literature data recognized that the aqua-BAS solutions or suspensions formed the supra molecular structures [1, 2].

The main aim of our comparative investigation was the obtaining of some facts that supported our idea about the BAS actions to a number objects under super low concentrations of BAS. We proposed that the hydrophobic biological active substances were accumulated from the experimental hydrophilic media to the hydrophobic structures of experimental objects. Thus the super low concentrations presented at the solution of experimental media, but at the “body” of our experimental objects this concentrations became so much bigger. The raising of concentrations may be 2-4 order. The examined BAS vary in its degree of hydrophilic / hydrophobic properties. Melafen is hydrophilic substance, it presented at aqua solutions around the membranes. Phenocsan also well is soluble, but it can distribute in surface regions of lipid bilayer. ICHFAN-C-10 is hydrophobic derivative of phenozan and penetrated to bilayer. Respectively the characteristics extreme of supramolecular complexes examined BAS [1, 2] and the effects extreme, "are shifted on concentrations".

References:

1. *Rigkina I.S. et other.* “The properties of supramolecular nanoassociates, formed at aqua solutions low and superlow concentrations by biological active substances” // *DAN*, v. 428, № 4, 2009, p. 487–491.
2. *Palmina N.P. et other* “Aqua solutions of Potassium phenozan: influence to the structural of the biological membranes and electric conductivity” // *DAN*, v. 429, № 1, 2009, p. 1–4.