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Effects of natural compounds and proteins on solvent properties of aqueous media

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Solvent properties (dipolarity/polarizability, hydrogen bond donor acidity and hydrogen bond acceptor basicity) are well known to be measurable with different solvatochromic dyes. These dyes shift their UV absorbance maximum wavelength depending on the particular solvent features. This solvatochromic comparison method was pioneered about 30 years ago by Kamlet and Taft. We used this approach to examine the effects of different macromolecular crowding agents such as dextran, Ficoll, polyethylene glycol, etc on the solvent properties of water. It was found that changes of protein properties in crowded solutions may be at least partially explained by the polymer-induced changes in the solvent properties of aqueous media. We also examined the effects of different osmolytes such as sorbitol, sucrose, trimethylamine N-oxide (TMAO), trehalose and urea on the solvent properties of water in their solutions. The solvatochromic comparison method was also used to analyze the effects of elastin-like polypeptide and small heat-shock protein on the solvent properties of water. The results obtained in these studies will be presented and discussed in the framework of possible new model of the regulatory effects of chemical chaperones *in vivo*.

Biography

Boris Zaslavsky graduated in Analytical Chemistry from the Moscow State University. He holds a PhD and a DSc (USSR Academy of Sciences), was a scientist at USSR Academy of Sciences (1971-1991), Visiting Fellow at Cornell University Medical School (NYC, 1991-1992), and KV Pharmaceuticals (1993-1994), Argonne National Laboratory (1994-1995). He is the founder of Analiza, Inc. (1996-present) and Cleveland Diagnostics (2014-present), where serves as a Chief Scientific Officer. He published 1 monograph, over 120 scientific papers and 7 patents. His research interests are development of analytical applications of aqueous two-phase partitioning, new clinical tests for early cancer detection and other applications, role of water in biology and protein-water interactions.

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