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VABILO NA PREDAVANJE
V OKVIRU DOKTORSKEGA ŠTUDIJA
KEMIJSKE ZNANOSTI / INVITATION TO THE
LECTURE WITHIN DOCTORAL PROGRAMME IN
CHEMICAL SCIENCES

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z naslovom / title:

Solvent effects on Protein Folding, Protein-Protein Association, and Molecular Recognition

v sredo, 25. 10. 2023 ob 15. uri /
on Wednesday, 25. 10. 2023 at 15.00
v predavalnici 1 v 1. nadstropju Fakultete za kemijo in kemijsko tehnologijo, Večna pot 113 / **in lecture room 1,** 1st floor at the Faculty of Chemistry and Chemical Technology, Večna pot 113

Vljudno vabljeni! / Kindly invited!

Abstract:

Many biochemical processes such as protein folding and self-assembly of proteins are highly specific. Proteins fold spontaneously into a very specific 3-dimensional structure. Proteins also associate spontaneously to form multi-subunit macromolecules. These processes occur in aqueous media. The question we pose is what is the role of water in these processes?

Until recently it was believed that the hydrophobic effect, i.e. the tendency of hydrophobic groups to "escape" from the aqueous environment is the dominant driving force for these processes.1

Analysis of all the solvent induced contributions to the thermodynamic driving forces for protein folding and protein-protein association reveals that, contrary to the commonly accepted paradigm, hydrophilic interactions might be more important than hydrophobic interactions.2

This conclusion was reached after critically examining the data on the various contributions to the driving forces for protein folding, and protein-protein association. Examples on the role of hydrophilic interactions on solubility of proteins, protein folding, protein-protein association and molecular recognition will be presented. Thus, hydrophilic interactions not only help in understanding the role of water in biochemical processes, but they can also be applied to design drugs that bind stronger to their targets.3-5

References:
1. W. Kauzmann, Advances Protein Chemistry 14, 1 (1959)
2. A. Ben-Naim, Biopolymers, 29, 567 (1990)
3. A. Ben-Naim, Molecular Theory of Water and Aqueous Solutions,
Part I: Understanding Water, World Scientific, Singapore (2009)
4. A. Ben-Naim, Molecular Theory of Water and Aqueous Solutions,
Part II: The Role of Water in Protein Folding Self-assembly and Molecular Recognition, World Scientific, Singapore (2011)
5. A. Ben-Naim, Myths and Verities in Protein Folding Theories, World Scientific, Singapore (2016)