

SEMINAR ANNOUNCEMENT

FRIDAY, 30.10.2015
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"To Be Soluble, or Not to Be, That is a Question"

Understanding the molecular determinants of the relative propensity for proteins to aggregate in cellular environment has been a central issue in attacking protein-aggregation diseases and in the development of human therapeutics. Despite the expectation that the protein aggregation can largely be attributed to the direct protein-protein interactions within an aggregate or in solution, we here unveil a crucial role of hydration water in ruling the aggregation propensity of proteins both in vitro and in vivo. The protein overall hydrophobicity, defined solely by the hydration free energy of a protein in its Nonomeric state sampling its equilibrium structures, was shown to predominantly dictate the protein aggregation propensity in aqueous solutions. We also find striking discrimination by the hydration water of positively and negatively charged residues depending on the protein net charge in regulating the solubility of a protein, which establishes novel design strategies for the biotechnological generation of aggregation-resistant proteins as biotherapeutics.

Interested persons are cordially invited to attend!