

Special Issue

How Cosolvents and Cosolutes Affect Biomolecules Stability and Activity

Message from the Guest Editors

This Special Issue focuses on biomolecules in the presence of a cosolvent or a cosolute, but its aim goes beyond this question. Although the description of a biomolecule solvation shell and of protein folding are some of the most pressing biophysical challenges, several points are still unclear and debated. The stability of biomolecules is crucial for several phenomena which are of interest for molecular biology, medicine and biotechnology, and physiological liquids are not solely composed of water. However, the molecular mechanisms behind the stabilization and de-stabilization of biomolecules by cosolvents or cosolutes are not yet included in a quantitative comprehensive theory. Stabilizers have generally been considered to be preferentially excluded from the protein surface, while de-stabilizers to preferentially bind to biomolecules' surfaces. Still others present controversial features according to their fraction in water. The study of mechanisms able to stabilize biomolecules can easily translate into the preservation of structure and functionality during storage and targeting, since many applications are affected by this issue.

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