

# Seminar

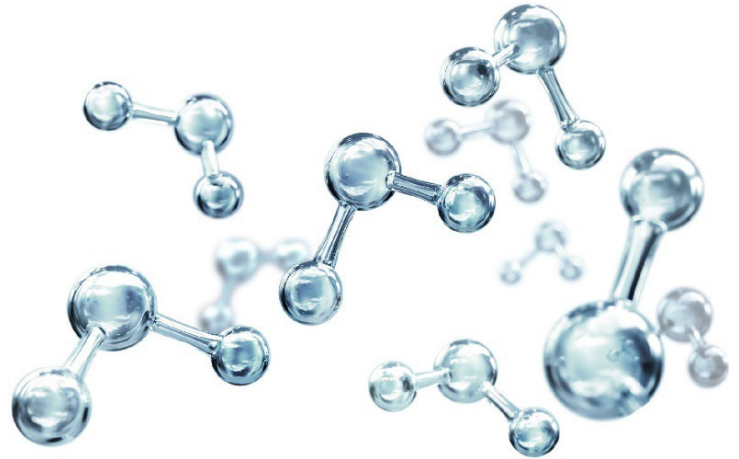
2nd of November 2023  
14:00 h (CET)

Zoom Virtual Meeting:

<https://tuhh.zoom.us/j/82631283465>

Meeting-ID: 826 3128 3465

Password: 978444



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## Role of Protein Solvation in Liquid-Liquid Phase Separation

Solvation water is integral in influencing the structure, dynamics, and function of proteins. Coupling of water molecules to the protein surface results in an interfacial region in which water molecules within this region have distinctly different properties than bulk water. Using Terahertz (THz) spectroscopy, we are able to gain insight into protein hydration water by monitoring changes in the water hydrogen-bonding network.

Liquid-liquid phase separation (LLPS) of intrinsically disordered proteins results in the formation of biomolecular condensates, which are membrane-less liquid-like protein enriched droplets. Here we investigate how protein solvation water contributes to condensate formation. Characterization of the hydrogen bonding network reveals that water solvating hydrophobic groups is stripped away in the membrane-less biomolecular condensates. Additionally, water left inside of the biomolecular condensates is highly constrained, indicative of a population of bound hydration water. These results uncover the vital role of hydration water in LLPS: the entropically favorable release of unfavorable hydration water serves as a driving force for LLPS.

