

Seminar

22th of May 2025
12:00 h (CEST)

Zoom Virtual Meeting:

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

Meeting-ID: 826 3128 3465

Password: 978444



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2D-IR spectroscopy to follow structural changes during biological phase transitions

Peptides, proteins and other biomacromolecules can form hydrogel-like, membraneless organelles in any cell. Those are referred to as protein droplets or protein condensates and perform a myriad of biological functions. The physico-chemical basis of condensate formation is liquid-liquid phase separation. As mainly intrinsically disordered macromolecules are prone to form condensates, those are difficult to study by regular biophysical or structural biology tools.

2D-IR spectroscopy is a femtosecond pump-probe technique providing multidimensional IR spectra. Both, the intrinsic high time resolution (fs-ps) as well as large spectra information in the two-dimensional spectra give access to detailed structural dynamics of condensate formation, namely the heterogeneity of structures becomes accessible. In our Early Science Project (Techert/Müller-Werkmeister) within CMWS, we are addressing peptide-based hydrogels derived from the nuclear pore complex with the sequence motif GLFG. We have probed samples in different areas of the phase diagram and are able to identify secondary structure elements relevant for hydrogel-formation. In addition, we were able to follow the temperature-dependent, reversible phase transition of the hydrogels.

