UniSysCat - Colloquium

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Start Time: Wednesday, June 22, 2022 05:00 pm

End Time: Wednesday, June 22, 2022 06:00 pm

C264
or via Zoom

Studying intrinsically disordered proteins by integrated NMR and single molecule fluorescence spectroscopy

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Intrinsically disordered proteins (IDPs) lack clearly defined structure and are therefore highly flexible and easily adaptable to different binding partners. This makes them important players in many biological processes, often with vital regulatory functions. Their dynamic features and broad range of interaction modes, however, render them difficult to study and analyzing their complexes often requires integrated approaches. Exploiting the complementarity of nuclear magnetic resonance (NMR) and fluorescence approaches allowed us to shed new light onto how IDPs and their interactions with folded proteins regulate and enable various biological processes, among which also the assembly of measles virus nucleocapsids counts. Particularly, we demonstrate how the measles virus replication machinery uses disorder on two of its major proteins for the regulation of nucleocapsid formation. We further describe a novel ultraweak interaction motif that is essential for viral transcription/replication within a 90 kDa sized complex of the replication machinery comprising a total of 450 disordered amino acids, which appears to be evolutionarily conserved. Further weak interactions are involved in liquid-liquid phase separation of the measles nucleoprotein phosphoprotein and these separated phases seem to catalyze the formation of viral nucleocapsids. Detailed molecular studies allowed us to combine parameters from NMR and single molecule fluorescence spectroscopy quantitatively and build molecular models of IDPs of predictive nature. We now aim to employ these novel developments to decipher the molecular foundation of the protein interaction network controlling the early phases of clathrin mediated endocytosis

Prof. Dr. Dorothea Fiedler

Organizer