BiophysTO Lunchtime Seminar Series

Date
Wednesday, Nov 7 2018, 12 - 1 pm

Location
Medical Sciences Building, Room 5231

Pizza and refreshments will be provided

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Using Ligand Binding Processes and EPR Spectroscopy for Functional Characterization of (Bio-)Macromolecules

Ligand binding processes constitute an important class of functions in the realm of biological and synthetic macromolecules. This goes far beyond the classic substrate-binding to enzymes to catalyze (bio-)chemical reactions and has in recent years been the focus of, e.g., research on intrinsically disordered proteins (IDPs), that often play a pivotal role in cellular signaling and information transfer processes. Synthetic macromolecules are often designed to fulfill tasks, as “smart material” e.g. in directed drug delivery processes or as host materials for sensor purposes. Here, I will give an overview of how electron paramagnetic resonance (EPR) spectroscopy in combination with paramagnetic ligands and/or bio-macromolecules can be used to obtain insights not only into the ligand-host interactions but also more conceptually into the inner working of the macromolecules themselves. We mainly use simple continuous wave (CW) EPR spectroscopy and nanoscale distance measurements with double electron-electron resonance (DEER) spectroscopy and – where possible - combine our insights with complementary data from NMR, dynamic light scattering (DLS), electron microscopy and other methods. Examples will be presented from the fields of IDP, transport proteins and synthetic core-shell polymers mimicking complex protein structures.

Host: Dr. Oliver Ernst

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