GESELLSCHAFT DEUTSCHER CHEMIKER

KOLLOQUIUM

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Titel

Electron spins as probes to study structure and function of biomolecules

Vortragender

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Abstract

Paramagnetic centers can provide us with unique information on how complex biomolecules fulfill their specific function and undergo conformational changes. With different methods of electron-spin resonance (ESR/EPR) spectroscopy it is possible to investigate biomolecules close to their physiological conditions and obtain structural and mechanistic information at the molecular level. We develop ESR techniques to simultaneously excite paramagnetic centers and coupled magnetic nuclei with microwaves or radio frequency in order to manipulate their magnetic interactions. Since ESR sensitivity and resolution substantially increase with the applied magnetic field, we perform our experiments at fields up to 14 Tesla and excitation wavelengths down to sub-mm range, i.e. in the regime where sophisticated microwave technology is required. We apply our methods to a variety of biomolecular systems, from enzymes to RNAs and transmembrane peptides. As a most representative example, we have been investigating ribonucleotide reductases (RNRs), which are enzymes essential for DNA replication and repair in every living cell. Recently, we have focused on the mechanism of radical initiation in the Class Ia RNR enzymes, which occurs via a unique long-range proton-coupled electron transfer (PCET) over 3.5 nm and across two protein subunits. Different strategies for hyperfine spectroscopy, isotope spin labelling and distance measurements are starting shining light in this unprecedented PCET mechanism.

Ort

Chemie, HS1 – Campus Nord, Otto-Hahn-Straße 6
Anfahrt: http://gdch.chemie.uni-dortmund.de

Zeit

Montag, 27.01.2020, 17:15 Uhr

Meet the Prof. für Studierende im Anschluss an den Vortrag

gez. Professor Dr. Daniel Rauh
Gesellschaft Deutscher Chemiker
Ortsverband Dortmund