FASSBERG SEMINAR SERIES

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online

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Spectroscopy of biomolecules by combining electron and nuclear spins

Magnetic resonance spectroscopy is one of the most important tools to achieve structural and functional information in various areas of natural sciences. Latest developments in the field are aimed at increasing sensitivity and resolution, which are limited by the small energy splitting and the external polarizing magnetic fields produced by available technologies. In spectroscopy of biomolecules a powerful approach is emerging, which takes advantage of the coupling between the spins of magnetic nuclei and those of unpaired electrons, the latter generally called paramagnetic centres. Both types of spin centres can be either endogenous or introduced by spin labelling techniques.

The lecture will report representative examples from these studies, extending from distance measurements on the atomic scale to about 10 nm in proteins and nucleic acids up to the structural elucidation of paramagnetic intermediates in enzymes, particularly ribonucleotide reductases targets of cancer drugs. For instance, in a transient enzyme complex we could recently measure low populated states of intermediates and their distances across the interface of two protein subunits, shining light on a key enzymatic step. We are also examining the capability to enhance *in situ* nuclear magnetic resonance signals in liquids, by using organic radicals as polarizing agents and microwave irradiation, for which we could demonstrate large (factors 10^2-10^3) enhancements.

Host: Marina Rodnina

Tuesday / 09.03.2021 / 11:00

zoom access data will be mailed before the seminar!