



Univerzita Karlova v Praze, Přírodovědecká fakulta

Department of Chemistry, Faculty of Science, Charles University in Prague
invites for a lecture from the lecture series

Quo Vadis Chemie

Rotational diffusion of Gd-chelates – what happens behind the curtain?



which will be delivered by

Lothar Helm

from

Institute of Chemical Sciences and Engineering,
Swiss Federal Institute of Technology in Lausanne
(EPFL), Switzerland

Wednesday, July 8, 2015 at 14:00

Lecture Hall CH3, Department of Chemistry, Faculty of
Science, Charles University in Prague, Hlavova 8, Prague 2

Abstract: Gadolinium(III) complexes are used as MRI contrast agents. Recent developments of targeted and responsive probes require agents with high relaxation enhancement to show sufficient targeted tissues/background contrast or with a response to a parameter like pH or temperature. To optimize efficiency of Gd-contrast agents, different strategies are applied, e.g. binding to large proteins as HSA or polymers (dendrimers), or aggregation in solution by non-covalent interaction.

Main parameters to be optimized are rotational diffusion behaviour and coordinated water exchange kinetics. To get detailed information on the rotational diffusion and its influence on spin relaxation as a function of the static magnetic field, longitudinal relaxation, $1/T_1$, is measured as a function of ^1H Larmor resonance frequency. The information on rotational diffusion is extracted from this so-called nuclear magnetic relaxation dispersion (NMRD) profile. In the presentation, different scenarios will be discussed to show how the measured relaxation enhancement can be linked to molecular dynamics.

