Speaker: Prof. Dr. Harald Schwalbe, Institute for Organic Chemistry and Chemical Biology, Center for Biomolecular Magnetic Resonance (BMRZ), Goethe University, Frankfurt

Title: NMR to monitor dynamic transitions in RNA and Proteins

In the Schwalbe lab, we develop and utilize high-resolution NMR to study the functional consequences of dynamic transitions of biomacromolecules.

In the presentation, two recent studies will be discussed: In RNA regulation, new regulation elements, so called riboswitches, have been identified that change gene expression in response to changes in small molecule metabolite concentration. Binding of metabolites to non-coding target RNAs located in the 5'UTR of mRNA induces an allosteric switch that change protein gene expression. Recently, we could unravel for the first the molecular mechanism of such allosteric conformational change (Reining et al., Nature, 2013). In a second example, the structural transition of the human prion protein towards the aggregated state is characterized. Here, NMR studies allow to resolve structural transitions at atomic resolution and identify sequence hotspots that drive the structural transitions leading to prion protein disease (Schlepckow et al., submitted 2013).