Among the three major structural biology techniques, NMR spectroscopy bases its strength on the ability of detecting pathways of conformational and dynamic linkages, which are essential for function. Thus, NMR is unique in its power to explain the functional mechanisms of biomolecules and complexes at atomic resolution.

In recent years, NMR methodological and technological advances, as well as developments in isotope labeling, have brought high molecular weight complexes into reach of solution-state NMR spectroscopy. In parallel, sophisticated relaxation experiments have allowed the discovery of minor populated states as essential players in the mechanism of function. Last but not least, solid-state NMR spectroscopy has grown to a point where structural and dynamic studies display the same level of resolution and precision as in solution-state NMR, with the advantage of being applicable to molecules of any size. With these capabilities, NMR plays a central role in the description of molecular functions at atomic resolution.

In this event, we will review the contribution of NMR spectroscopy to the elucidation of biological mechanisms; in addition we will discuss the future of the field, in particular with respect to the integration of NMR spectroscopy in hybrid structural biology approaches.