



ACS Local Section
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NMR-Based Tools for Structural Biology of Complex Systems: From Gels to Cells

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Date: **March 24th, 2022**

Time: 7:00 pm ET via Microsoft Teams

Abstract

Recent advances in structural biology have dramatically expanded the scope of proteins and assemblies that are now amenable to structural analysis. Yet, many biological systems display dynamics and undergo transformations that have been difficult to capture experimentally, especially in complex or native settings. In this context, my group has been developing NMR-based methodologies to describe such challenging systems and to pave the way to the next exciting structural biology frontier, the cellular environment. Here, I will present our progress on two fronts: 1) Development of NMR methodologies to describe the molecular basis of protein phase transitions from the liquid to the gel and solid states. In particular, I will focus on the transitions displayed by heterochromatin protein 1 α (HP1 α), a key player in gene regulation and chromatin organization. 2) Development of sensitivity-enhanced NMR approaches suitable for the cellular environment. Our work is based on a methodology called dynamic nuclear polarization (DNP) which can transfer polarization from electron to nuclear spins and thus increase nuclear signals by several orders of magnitude. For this purpose, we develop small molecule DNP polarization agents that contain unpaired electron spins and that can be targeted selectively to a protein of interest. These agents have allowed us to obtain NMR structural data of tiny amounts of proteins (1-5 μ g) and to study the polarization transfer mechanisms in targeted DNP experiments.

Connection Information

This will be a virtual meeting hosted via Microsoft Teams. A direct link to the meeting is located [HERE](#). Further information can be found on the NMR Topical Group website (<https://www.njacs.org/nmr-spectroscopy-topical-group>). Please reach out to Jonathan Williams (jwilliams@njacs.org) or Tom Popp (thomas.osbornpopp@rutgers.edu) with any questions.

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