ACS Local Section
North Jersey

Using NMR spectroscopy to interrogate Protein-Glycan interactions

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Date: **Thursday April 23rd, 2026**

Time: 12:00 pm ET via Microsoft Teams

Abstract:

Glycans are a fundamental yet understudied class of biomolecules that play essential roles in biological systems. Our research seeks to understand how proteins engage glycans through both specific and nonspecific interactions. In this talk, I will highlight two complementary vignettes that demonstrate how NMR spectroscopy can address key challenges in glycobiology.

First, we examine specific protein-glycan recognition using the antiviral lectin Griffithsin and synthetic mimetics of high-mannose glycans. By integrating NMR spectroscopy with isothermal titration calorimetry (ITC), biolayer interferometry (BLI), and computational docking, we show that intramolecular avidity is a central determinant of high-affinity binding. These results further provide general design principles for the development of competitive inhibitors of protein-glycan interactions.

Second, we explore nonspecific interactions between proteins and glycans using ^{19}F NMR. These methods enable direct observation of protein behavior in glycan-rich environments that mimic the glycocalyx, revealing how such environments influence protein folding and protein-protein interactions. We will also discuss ongoing efforts to extend these strategies toward on-cell NMR spectroscopy.

Together, these studies highlight how NMR-based approaches can provide molecular-level insight into glycan-mediated biology and open new avenues for probing complex biomolecular environments.

Connection Information

This will be a virtual meeting hosted via Microsoft Teams. A Link will be posted closer to the date. Further information can be found on the NMR Topical Group website.

Please reach out to QingZhe Ni (qingzhe.ni@merck.com) or Tao Xie (tao.xie@bms.com) with any questions.

Presented by the NMR Topical Group – North Jersey ACS