

Breaking the limits in glycan recognition by using NMR

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Molecular recognition by specific targets is at the heart of the life processes. In recent years, it has been shown that the interactions between proteins (lectins, enzymes, antibodies) and carbohydrates mediate a broad range of biological activities, from fertilization and tissue maturation, to pathological processes. The elucidation of the mechanisms that govern how sugars are accommodated in the binding sites of these receptors is currently a topic of interest. Thus, unravelling the structural and conformational factors and the physicochemical features that rule the interactions of these molecules is of paramount interest. This presentation is focused on the application of state-of-the-art NMR methods both from the ligand and receptor's perspective to study molecular recognition processes between a variety of receptors of biomedical interest and glycans. Lectins, antibodies, and enzymes, both wild type and mutants, have been used as receptors with the final aim to know and to evaluate the relative importance of polar (hydrogen bonding, electrostatic interactions) and non polar (van der Waals, CH- π) forces in the recognition process. As recent examples, key details of glycan recognition will be shown, with special emphasis in the application of novel ¹⁹F- and paramagnetic-NMR methods.

References

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