

Insights into protein–carbohydrate recognition by NMR spectroscopy

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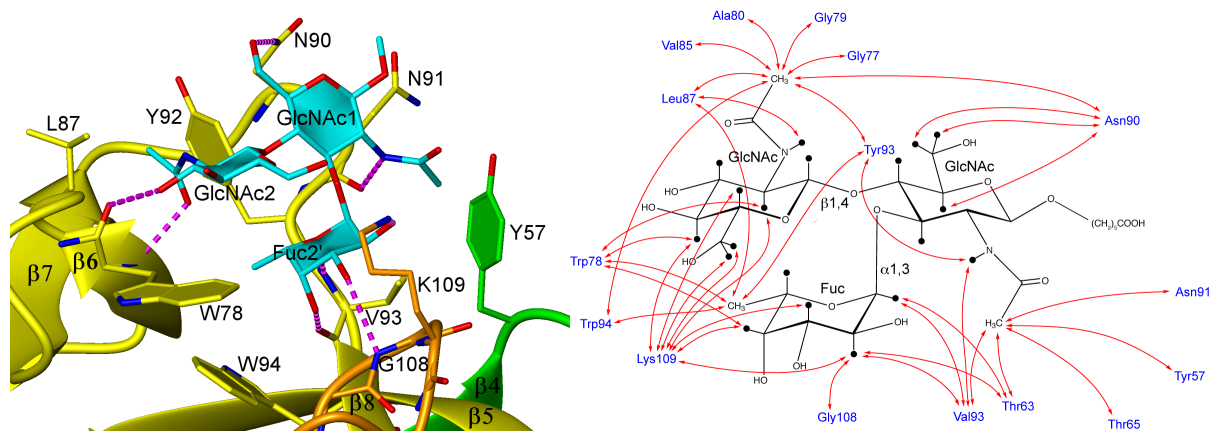
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Protein-carbohydrate interactions play key roles in a vast amount of biological processes like cell-cell interactions, modulation of the immune system, cancer progression and metastasis and pathogen-host recognition. An enormous variety of glycoepitopes is functionally relevant – the glycode. We are just at the beginning to understand how glycoepitopes are recognized by carbohydrate binding proteins, also called lectins.

We demonstrate how NMR spectroscopy can play an important role in identifying the target glycoepitope, analyzing its interaction with the protein, determining three-dimensional structures of lectin-carbohydrate complexes in solution and elucidating the contribution of specific interactions to affinity and specificity [1]. In addition NMR was used to detect pre-formed bioactive conformations of some carbohydrates in solution that are stabilized by a non-conventional C-H...O hydrogen bond [2]. Examples that will be presented include a fungal defense lectin targeting N-glycans of invertebrate predators [3] and human lectin domains of immuno-modulating receptors.



References:

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