# Carbohydrate – Aromatic interactions in Carbohydrate Foldamers

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T Cyclodextrins (CDs), consisting of sugar molecules bound together to form different sizes ring, are regarded as the only homogenous, well-defined carbohydrate-based architecture capable of adopting a stable 3-D conformation.[1] While CDs can host hydrophobic guests in their cavity, the over-rigid structure limit its applicability in supramolecular chemistry and biology. Expanding the scope of carbohydrate-based architectures capable of selectively recognizing, binding and hosting aromatic subtracts will be significant for the design of protein ligand and drugs.

Recently, we reported the synthesis of a carbohydrate foldamer, that self-organize into a rigid hairpin conformation.[2] Here, we adjusted the 3-D conformation of the carbohydrate hairpin and tuned its electron density in order to promote the interaction between the carbohydrate foldamer and aromatic subtracts *via* CH/π interactions[3]. Automated glycan assembly (AGA) allowed for the fast synthesis of a series of carbohydrate foldamer analogues. Lateral chemical modifications including phosphorylation, sulfation, and amination allowed for the introduction of ionic residues to tune the electronic properties of the hairpins. The interaction between the modified carbohydrate foldamer and a series of aromatic subtracts was studied by multiple NMR techniques. Specific CH/π interactions were identified, suggesting that carbohydrate foldamers could be designed to bind polypeptides and proteins.

Bibliographic references:

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