FROM SYNTHESIS TO APPLICATIONS: SYNTHETIC GLYCO-TOOLS FOR EXPLORING AND EXPLOITING THE GLYCOME

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The stereoselective synthesis of glycosides remains one of the biggest challenges in carbohydrate chemistry.[1] The chemical synthesis of complex carbohydrates generally involves the coupling of a fully protected glycosyl donor bearing a leaving group at its anomeric centre, with a suitably protected glycosyl acceptor (R-OH). In many instances, these reactions lead to a mixture of two stereoisomers, which makes the process inneficient. Over the last few years, our group has endeavoured to develop expedient methods to address this important synthetic challenge.[1]

In this lecture, I will discuss the use of transition metal catalysis for the stereoselective synthesis of deoxyglycosides, including the α,α-stereoselective synthesis of trehalose analogues, as well as some of our recent work in organocatalyzed glycosylations with improved reactivity.[2] Moreover, I will also disclose the development of imidazolium-based MS labels and their applications to expedite oligosaccharide synthesis and enzyme discovery in glycobiology.[3] Examples of glycan-based probes and their application in the development of a rapid bacteria screening strategy will also be discussed.[4]

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