

Adventures in anomeric reactivity

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Glycosylation reactions constitute a class of reactions that fuse separate sugar units forming glycosides, oligosaccharides and ultimately highly complex polysaccharides via glycosidic bonds. The configuration of the glycosidic linkages determine saccharides' shape and thus the properties including their biological function to a great degree. Efficient access to structurally defined saccharides or derivatives thereof is highly desired in order to study their properties and effects in different fields of research. The glycochemistry synthetic toolbox has a rich history of successful syntheses of highly complex target structures, yet many of these strategies depend on laborious protecting group modifications.

The question that we sought to answer was whether a novel reagent-based approach borrowing aspects of different modes of glycosylation would be feasible. With a broad potential substrate scope in mind, we envisioned a novel auxiliary-mediated glycosylation, which relies on spatial tethering of donor and acceptor. The tethered linker structures do not only provide spatial orientation to enhance diastereoselectivity, but should also simultaneously serve to activate both donor and acceptor in the presence of a suitable promoter.