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SYNTHESIS OF AZOBENZENE-BASED SACCHARIDES AND INVESTIGATION OF THEIR PHOTOSWITCHING PROPERTIES IN WATER

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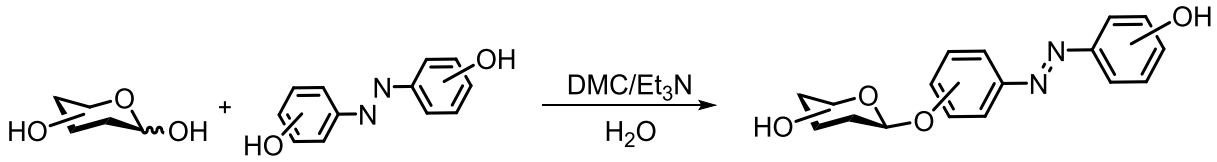
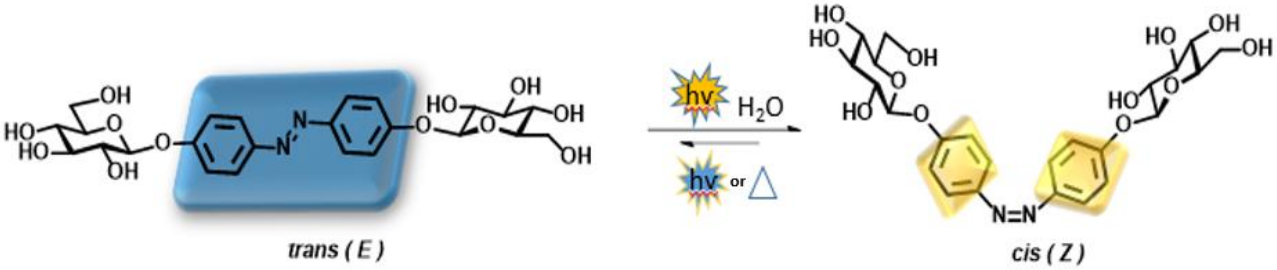
Molecular photoswitches with photoswitching ability in aqueous medium are highly demanded for biological applications and photopharmacology.[1, 2] However, the commonly developed photoswitches like azobenzenes, diarylethenes are barely soluble in water. Linking carbohydrates to a photoswitching unit is an interesting approach to obtain water-soluble photochromic compounds.

Since several years, azobenzene-functionalized photoswitchable glycoconjugates have been developed for light-controlled carbohydrate-protein interactions,[3] cell adhesion,[4] enzyme inhibitors[5] and glycolipid mimics,[6] and so on. However, glycosylation with unprotected sugars in aqueous media remains a challenging task.[7] Recently, DMC (2-chloro-1,3-dimethylimidazolinium chloride) mediated glycosylation of unprotected sugars with phenols in aqueous medium has shown promising results.[8]

As a continuing interest in the development of photoswitchable carbohydrates,[9] we are developing the DMC-mediated glycosylation of hydroxyazobenzene with unprotected sugars (Scheme **1**). After optimization of reaction conditions, we are able to prepare a series of water-soluble glycosyl azobenzenes. Furthermore, the synthesized glycosyl azobenzenes displayed remarkable photoswitching behavior in water (Scheme **2**). These new results will be presented.



Scheme 1: DMC-mediated glycosylation of hydroxy-azobenzene derivatives.



Scheme 2: Isomerization of glycosyl azobenzene upon light and heat.

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