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Diastereoselective Synthesis of Analogues of Neuraminic Acid

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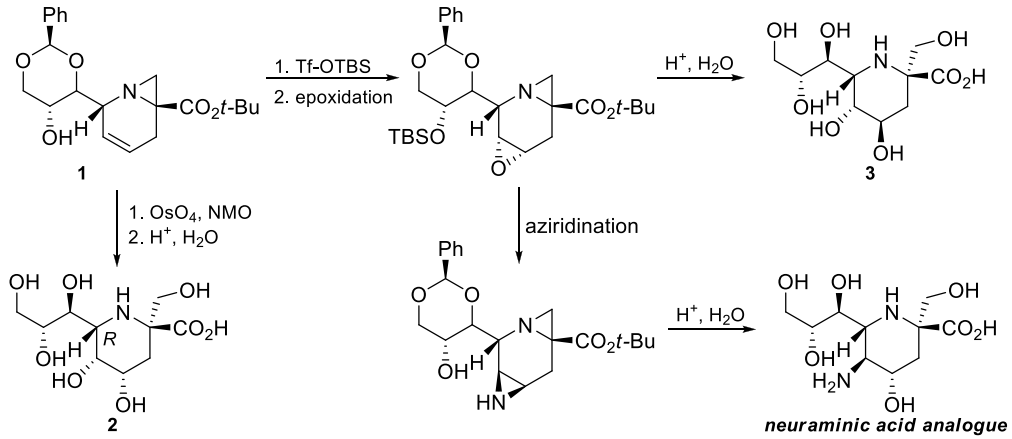
Siliac acids frequently terminate oligosaccharide side chains in glycoproteins and glycolipids. In this position they have been found to mask recognition by proteases or glycosidases, extending glycoproteins and glycolipids lifetime and function.[1] The interest in the sialic acids chemistry in which neuraminic acid is included has rapidly increased in last years, especially since their involvement in the regulation of a great variety of biological phenomena was recognised.[2]

In our previous work, we found that combination of D-erythrose 1,3-butadiene with *t*-butyl 2*H*-azirine 3-carboxylate through Diels-Alder cycloaddition gave as major product the *(R)*-configured cycloadduct **1**, in 58% yield.[3] Analogues of neuraminic acid can be achieved from this adduct in a few steps, following different methods of oxidation of the double bound (Scheme 1). Osmilation of the cycloadduct was found to be totally stereo-selective, the addition occurring by the *si* face. After benzylidene acetal cleavage under acid hydrolysis was obtained product **2**. On the other hand, epoxidation of the cycloadduct followed by nucleophilicic ring-opening will give access to the configuration described in compounds **3**, and by aziridination of the epoxide is achieved the L-*gluco* neuraminic acid configuration.



Scheme 1: Synthesis of neuraminic acid analogues.

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