Synthesis of the *B. adolescentis* EPS repeat containing cis- and trans-linked 6-deoxy-talose

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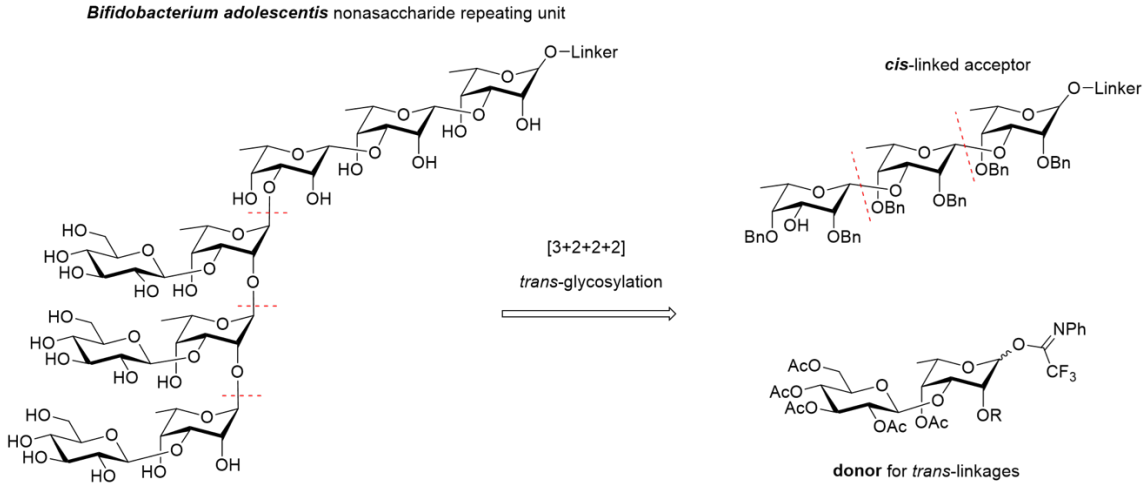
Exopolysaccharides (EPS) are present on the outside of bacteria, where they can be loosely attached to the cell wall or secreted in the environment. EPS of lactobacilli and bifidobacteria demonstrate several beneficial effects such as antitumor activity, and they serve as prebiotic or as immune modulators.[1] The EPS structure of *Bifidobacterium adolescentis,* a beneficial strain commonly observed in the gut microbiome, contains 6-deoxy-l-talose (6dTal) residues linked in a 1,2-*cis* fashion.[2] To understand the biological impact of the *cis*-linked 6dTal moieties, well-defined structures are needed. Because little is known about the glycosylation properties and stereochemical preferences of 6dTal, this is the main challenge of this project.

To develop a robust method to couple 6dTal units through *cis*- and *trans*-linkages, we set out to develop an efficient protecting group strategy, and performed a thorough study of the reactivity and selectivity of the resulting 6dTal donors and acceptors. The best suitable 6dTal building blocks were further applied in the successful nonasaccharide assembly.



Scheme 1. Nonasaccharide repeating unit of the B. adolescentis exopolysaccharide, and the synthetic strategy

Bibliographic references:

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(2) Nagaoka, M.; Muto, M.; Yokokura, T.; Mutai, M. (1988) J. Biochem. (103) 618–621.