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TOPIC(s) : Alternative technologies

Synthesis of a tetrasaccharide derivative related to the cell wall polysaccharide of *B. anthracis* utilizing one-pot glycosylation reactions

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PURPOSE OF THE ABSTRACT

Anthrax causing flu-like symptom emerges after the multiplication of the bacteria and it starts producing toxins inside the infected victim.1 Although, antibiotics inhibit the growth of *Bacillus anthracis* but patients sometimes die out of intoxication.2 Besides, gastrointestinal and inhalation- anthrax are more resistant to treatment. Moreover, *B. anthracis*, resistant to the existing antibiotics have already been developed.3 A recent use of *B. anthracis* spores as a biological weapon has caused the need for efficient vaccine development and detection systems.4 Synthesis of oligosaccharide related to bacterial antigen is part of the corresponding vaccine development program. With this end in view, we have synthesized the tetrasaccharide derivative 1 related to the repeating unit (A, Figure 1) of the cell wall polysaccharide of *B. anthracis*.

The retrosynthetic analysis (Figure 1) indicated us to use the corresponding mono- and disaccharide building blocks (2, 3 and 4). D-galactose was used as the starting material for preparation of the rare sugar anthrose based building block (5). The other monosaccharide units (2, 3 and 6) were synthesized starting with L-rhamnose, either following literature reported chemistry and/or using our own developed methods and also minimizing the number of steps where possible by carrying out some of those sequentially in one pot. Finally the target tetrasaccharide (1) was obtained in good yield by one-pot glycosylation reactions based on the building blocks 2, 3 and 4.

FIGURES

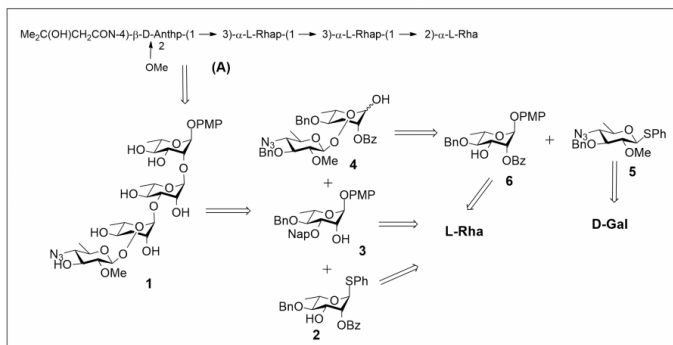


FIGURE 1

Figure 1

Retrosynthetic analysis of the target tetrasaccharide derivative 1

FIGURE 2

KEYWORDS

B. anthracis | tetrasaccharide | one-pot | glycosylation reactions

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