First Total Synthesis of Tetrasaccharide Repeating Unit of Vibrio Cholera 043

Ankita PAUL [1], Diksha RAI [1], Kabita PRADHAN [1], Preeti [1], Amar MISHRA [1], Suvarn S. KULKARNI [1]

[1] Indian Institute of Technology, Bombay, INDIA

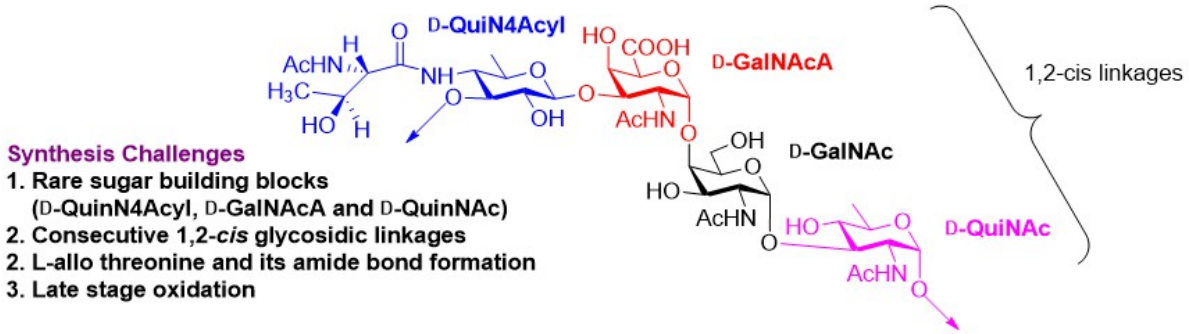
juhipaul17@gmail.com

Cholera is a well-known deadly disease causing acute watery diarrhoea and severe dehydration. According to WHO fact sheets, it is estimated that every year about 1.3 to 4.0 million people get infected due to cholera, and 21,000 to 1,43,000 deaths are reported worldwide.[1] *Vibrio cholera*, a causative agent of deadly pandemic-cholera is a facultative, anaerobic, Gram negative, marine bacterium having both human and environmental stages in its life cycle.

This deadly pathogen is a threat for many developing countries, predominately in Asia and Africa.

Therefore, in order to curb the spread of the disease, development of vaccines is an absolute essential. It is noteworthy that the glycans present on the surface of dense bacterial cell wall are different than the monosaccharides on human glycome. This distinguishing information is the gateway for the development of vaccines and inhibitors. Our lab established an efficient, one-pot methodology of sequential displacements of triflates by suitable nucleophiles for the synthesis of various orthogonally functionalised rare D- and L-deoxy amino sugars.

These building blocks can can be assembled to get access to biologically important and structurally complex glycoconjugates. Herein, we report the first total synthesis of the tetrasaccharide repeating unit (RU) of OPS of *Vibrio cholerae* O43. The structure has a novel D-viosamine (Quip4NAcyl) unit attached to L-threonine amino acid.[2] The significant challenges are: (a) synthesis of functionalized rare monosaccharide building blocks i.e D-quinosamine (D- QuipNAc), D-viosamine (Quip4NAcyl), D-galacturonic acid moiety (D-GalpNAcA) and D- galactosamine (D-GalpNAc) (b) Installation of 1,2-cis glycosidic linkages, (b) amide bond formation (b) late stage functional group interconversion as well as global deprotection.



Tetrasachharide Repeating unit of O-antigen of *Vibrio cholera* O43

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