Evaluation of 8-azido-Kdo incorporation in LPS in gram-negative bacteria

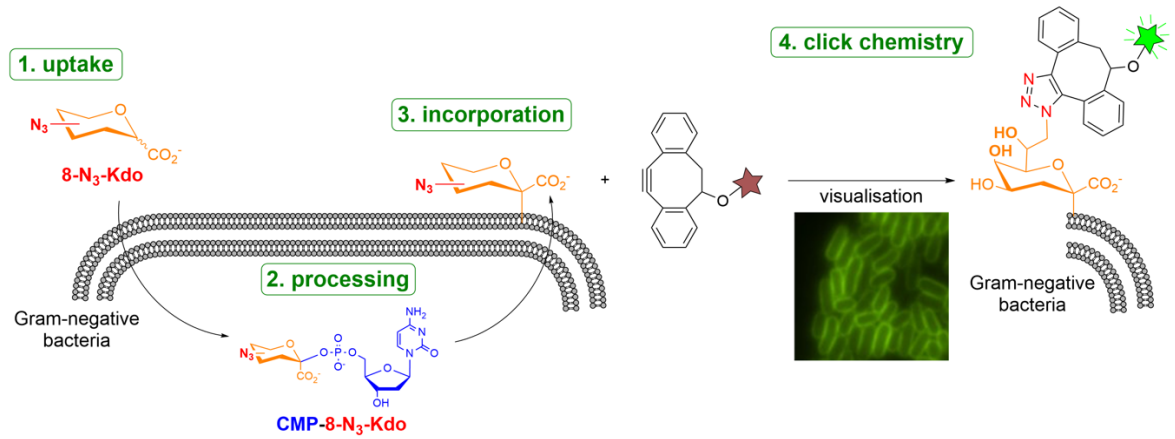
Zeynep ZIYLAN [1], Marthe WALVOORT [1], Dirk-Jan SCHEFFERS [1]

[1] University of Groningen THE NETHERLANDS

z.s.ziylan@rug.nl

Metabolic Oligosaccharide Engineering[1] coupled with click-chemistry is a powerful and increasingly applied method to investigate cell components, including carbohydrates and glycoconjugates. Within this area, the 8-azido derivative of the bacterial sugar 3-deoxy-d-*manno*-oct-2-ulosonic acid (8-N_3-Kdo) has gained value in selective labeling of lipopolysaccharides (LPS) that are a key component of the outer membrane of Gram-negative bacteria. Several studies have reported that 8-N_3-Kdo is successful in labeling LPS of several Gram-negatives such as non-pathogenic and pathogenic *Escherichia coli* strains, *Salmonella typhimurium*, *Legionella pneumophila* and *Myxococcus xanthus*.[2,3]

Due to its increasing application in the investigation of LPS biosynthesis and cell surface labeling, we became interested in exploring the nature and efficiency of LPS labeling using 8-N_3-Kdo in a variety of Gram-negative bacteria. First, we optimized the synthesis of 8-N_3-Kdo, which was subsequently used to metabolically label Gram-negative bacteria, mainly focusing on non-pathogenic and pathogenic *E. coli* strains. Interestingly, different extents of labeling were observed, and the majority of labeled LPS appears to be the 'rough' LPS variant. In this communication, our optimized synthesis route of 8-N_3-Kdo, our findings on the extent of LPS labeling across species and a characterization of the labeled LPS structures will be presented.



Bibliographic references:

(1) D. H. Dube, C. R. Bertozzi, (2003), Curr. Opin. Chem. Biol. (7), 616–625.
(2) A. Dumont, A. Malleron, M. Awwad, S. Dukan, B. Vauzeilles (2012), Angew. Chemie (124), 3197–3200.
(3) F. Saidi, O. J. Gamboa Marin, J. I. Veytia-Bucheli, E. Vinogradov, G. Ravicoularamin, N. Y. Jolivet, A. A. Kezzo, E. R. Esquivel, A. Panda, G. Sharma, S. P. Vincent, C. Gauthier, S. T. Islam (2022), ACS Omega (7), 34997–35013.