Controlling the activity of bacterial sialidases with bioorthogonal chemical reporters

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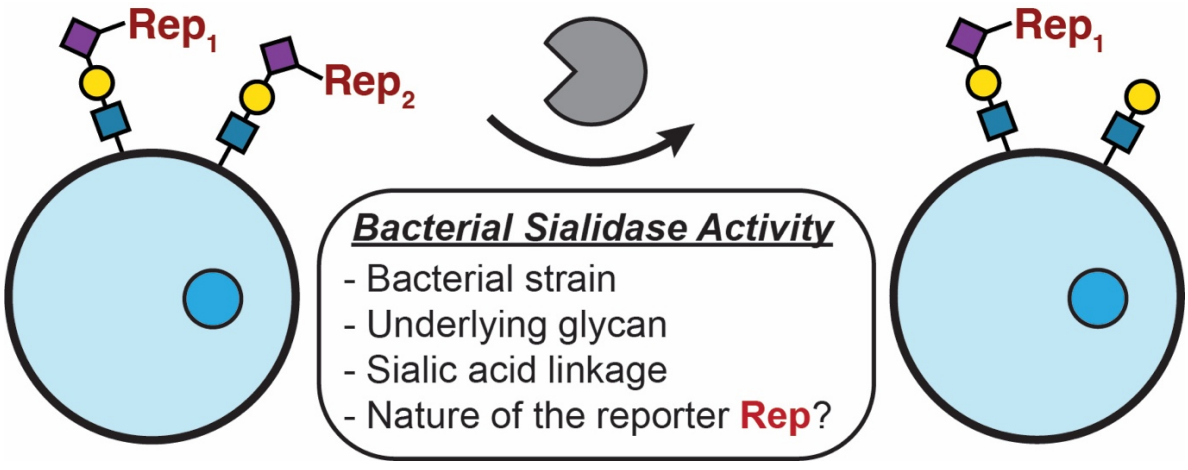
Sialic acids are anionic nine-carbon carbohydrates generally found as terminal sugars of mammalian cell-surface glycoproteins and glycolipids. Because of their distinct cellular location, sialo-glycoconjugates (also known as sialosides) are often key mediators of physiological and pathological events, including cell adhesion, host–pathogen interactions, and cancer progression.[1]

The bioorthogonal chemical reporter strategy, which elegantly combines the use of metabolically labeled azido-sugars and highly reactive cyclooctyne probes, is emerging as a versatile technology for labeling and visualizing sialosides.[2] This strategy relies on the fact that bioorthogonal chemical reporters are highly reactive species while being biologically noninvasive.

During this talk, I will present our recent efforts to show that chemical bioorthogonal reporters may actually impact sialosides processing enzymes activity.[3] More specifically, I will describe how bacterial sialidases may be significantly affected by the presence of bioorthogonal reporters on mammalian cell-surface sialosides, providing us with novel, more selective, chemical biology tools for studying the biological roles of cell-surface glycans.



Factors that can influence bacterial sialidases activity

Bibliographic references:

[1] A. Varki (2007), Nature (446) 1023.
[2] Z. S. Chinoy, F. Friscourt (2022), Isr. J. Chem. doi: 10.1002/ijch.202200055.
[3] Z. S. Chinoy, C. Bodineau, C. Favre, K. W. Moremen, R. V. Durán, F. Friscourt (2019), Angew. Chem. Int. Ed. (58) 4281.