

5th International Conference on

GLYCOBIOLOGY & GLYCOPROTEOMICS

&

3rd International Conference on

MOLECULAR BIOLOGY & NUCLEIC ACIDS

August 27-28, 2018 | Toronto, Canada

Glycosyl cation: From observation to mimicry

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Glycosyl cations are crucial intermediates formed during enzymatic and chemical glycosidic bond formation and hydrolysis. The high reactivity and short lifetime of these reaction intermediates make them very challenging to characterize using spectroscopic techniques. Their observation is thus of high current interest to both gain insight into the mechanistic pathways of SN1-like glycosylation at the atomic level and to design potent inhibitors of the glycoside processing enzymes that go through such cationic intermediates by mimicry. Using super acidic conditions, we have been able to recently observe such chemical species in their polyprotonated form in a condensed phase and to have access to their confirmation. Our most recent results dealing with this approach will be presented as well as our parallel efforts to design potent glycosidase inhibitors mimicking such cationic intermediates in order to target enzymes of therapeutic interest.

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