

Developing Building Blocks for Automated Assembly of Trypanosomatida Surface Glycans



R&D Unit:
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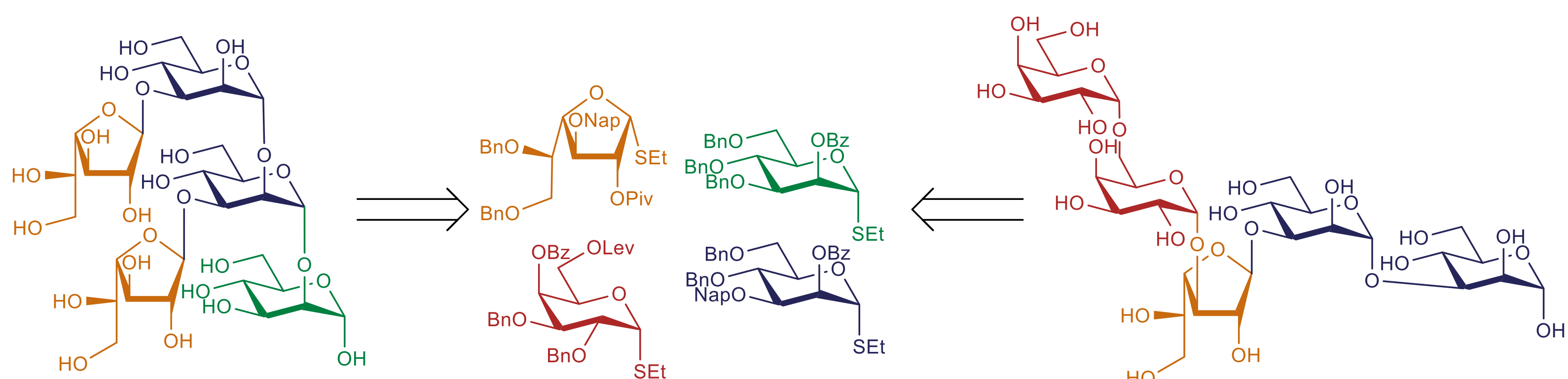
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Abstract

Glycosylinositolphospholipids (GPIs) are glycoconjugates found in the membranes of Protozoa. GPIs play a role in the activation and regulation of host immune response during infections such as Chaga's disease and leishmaniasis caused by the parasites *Trypanosoma cruzi* [1] and *Leishmania spp.* [2]. Understanding the activity of these glycolipids may provide practical applications for fighting these infections and the development of vaccines [3]. The isolation of single GPIs is a challenging process. However, chemical synthesis emerged as an alternative to obtain these molecules in a pure and high amount.

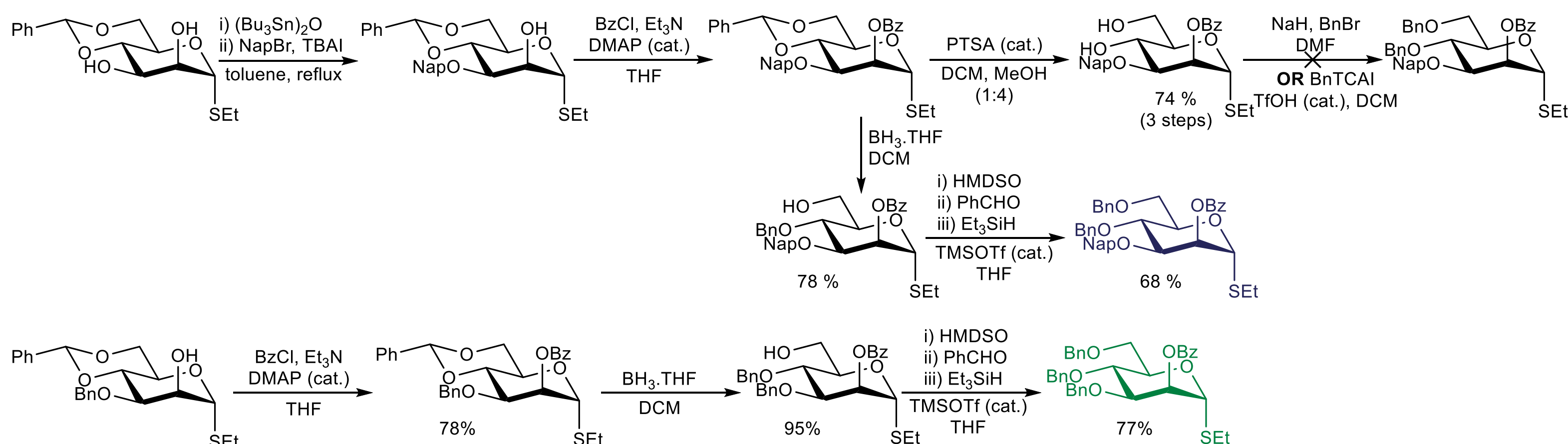
We envisioned the synthesis of fragments from two structures, a GPI and a GIPL, of *T. cruzi* and *leishmania* containing galactofuranose units. Automated Glycan Assembly (AGA) of these structures requires four appropriately protected building blocks. For this, we developed a methodology for the synthesis of galactofuranose building blocks. We installed the orthogonal protecting groups using regioselective reactions aiming to reduce the number of reaction steps required to prepare target building blocks.

Retrosynthetic Analysis



T. cruzi GPI

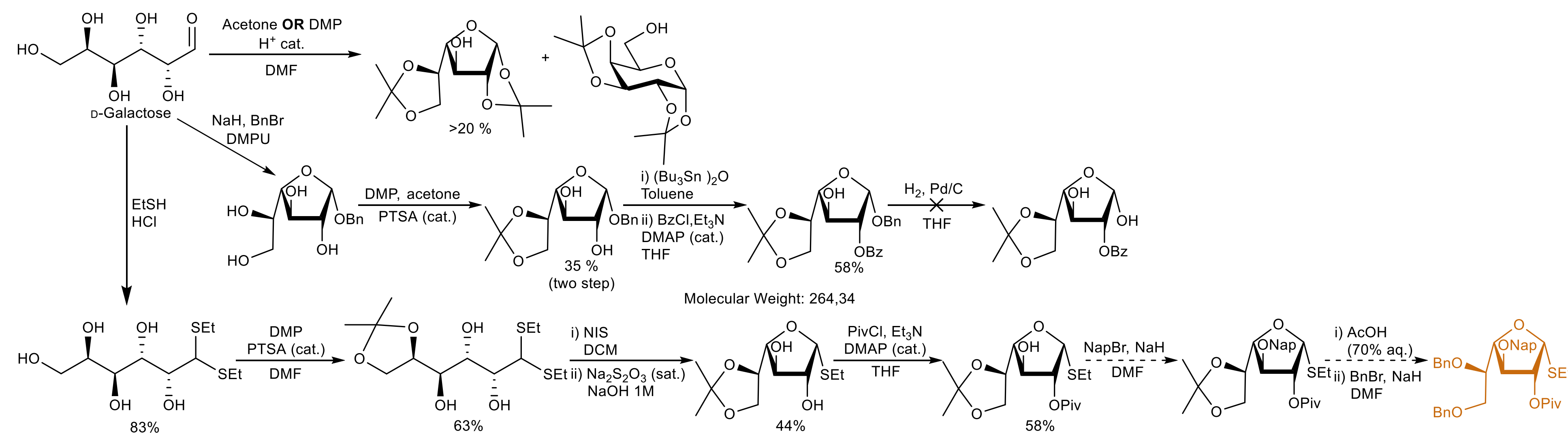
Mannopyranose Building Blocks



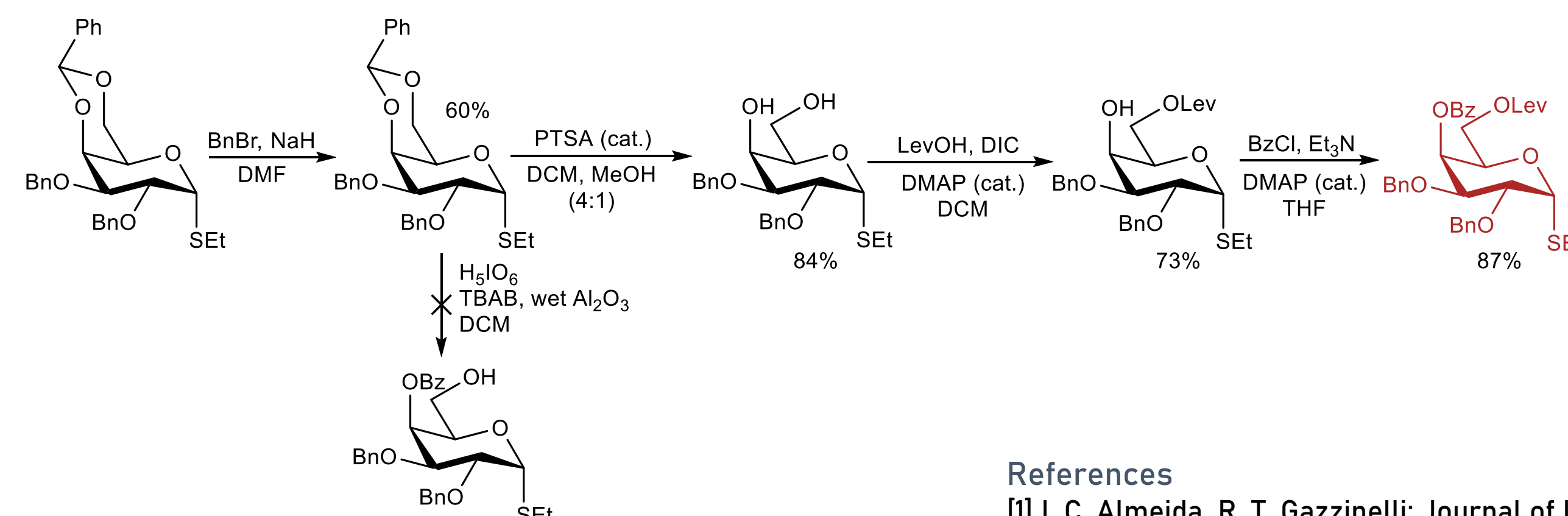
Conclusions

- We developed a new synthetic strategy for the synthesis of galactofuranose thioglycoside building blocks
- One-pot silylation/ reductive benzylation was effectively used as an alternative to basic and acid benzylation methods
- Target structures will be used to investigate the role of galactofuranose in immune response, aiming at potential applications for these glycoconjugates

Galactofuranose Building Block



Galactopyranose Building Block



References

- [1] I. C. Almeida, R. T. Gazzinelli; Journal of Leukocyte Biology, 2001, 70, 467-477
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- [3] A. S. A. Mohammed, W. Tian, Y. Zhang, P. Peng, F. Wang, T. Li; Carbohydrate Polymers, 2020, 237, 116120

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