FROM STEREOCONTROLLED GLYCOSYLATION TO AUTOMATED CHEMICAL SYNTHESIS

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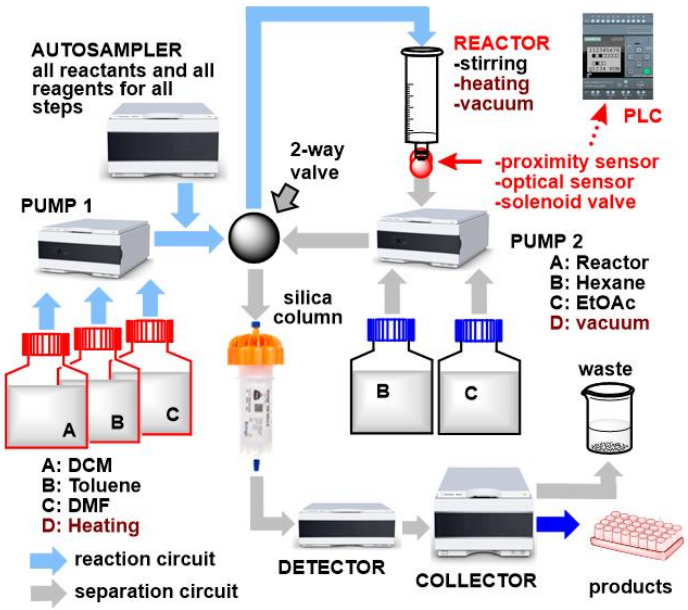
From the building blocks of nature to disease-battling pharmaceuticals, carbohydrates have had a profound impact on evolution, society, economy, and human health. Numerous applications of these essential biomolecules in many areas of science and technology exist, most of which can be found at the forefront of therapeutic agent and diagnostic platform development. Although carbohydrates are desirable for the pharmaceutical and biomedical communities, these molecules are very challenging targets for chemists because of the need for functionalization, protecting and leaving group manipulations, controlling anomeric stereoselectivity, separation, and analysis. The development of practical methods for the synthesis of building blocks, chemical glycosylation, and glycan assembly represent demanding areas of research.

At the core of this presentation is the development of new methods, strategies, and technologies for the chemical synthesis of glycans. These tools will be discussed in light of recent results related to the development of new glycosylation reactions [1], methods for controlling the stereoselectivity [2], and HPLC-based automated synthesis [3]. The effectiveness of methods developed will be illustrated by the synthesis of glycopharmaceuticals. This work has been generously supported by the National Institutes of Health and the National Science Foundation.



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