

Abstract

Pure glycans are key to enable biochemical, biophysical and immunological studies aimed at understanding the role of carbohydrates. Described is the development of a fully integrated platform for automated glycan assembly (AGA) based on solid-phase oligosaccharide synthesis¹ and carbohydrate arrays to address biological problems. Particular emphasis in this lecture will be placed on the new automated synthesis platform² that has been commercialized.³ Access to defined polysaccharides as long as 50-mers enables now biological as well as materials science investigations.⁴ These synthetic polysaccharides can be combined much like “molecular LEGO” to create even larger oligosaccharide assemblies.⁴

Carbohydrate arrays are used as diagnostics and in support of vaccine programs that are based on conjugates with synthetic oligosaccharides to screen blood sera.⁵ Case studies of specific vaccines will provide an appreciation for the approach that is now advancing candidates toward clinical testing.^{6,7} Fully synthetic vaccine candidates exploit iNKT cells for to induce a robust and protective immune response.⁸

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