



## Functional glycomics through chemical synthesis

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Most cell surface and secreted proteins are modified by covalently-linked glycans which are essential mediators of biological processes such as protein folding, cell signaling, fertilization, embryogenesis, and the proliferation of cells and their organization into specific tissues. Overwhelming data support the relevance of glycosylation in pathogen recognition, inflammation, innate immune responses, and the development of autoimmune diseases and cancer, Although the functional importance of glycoconjugates are well-established, molecular mechanisms by which these compounds exert their functions have been difficult to define. We have addressed these difficulties by the development of methods for complex oligosaccharide and glycoconjugate synthesis, application of the new methods for the preparation of biologically important targets such as tumor-associated antigens, capsular polysaccharides, lipopolysaccharides, and heparan sulfates, and use of the resulting compounds in biological and biomedical studies. Several examples of such programs will be described.