

Glycomics: the Forefront of Post-Genomic Research to Advance Therapeutics

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Complex glycans that are covalently attached to proteins and lipids have a crucial role in diverse biological processes ranging from development to coagulation to infection by bacterial and viral agents. Especially, as part of glycoprotein, glycans modulate protein activity, stability, and immunogenicity of protein therapeutics. The past decade advances in genomics, proteomics and mass spectrometry has remarkably increased our understanding of the function and structure of complex glycans, elevating glycomics to the forefront of post-genomic research to facilitate the development of drug and diagnostic tools. Here, recent strategies will be outlined to harness the glycosylation machinery for the development of new and improved drugs by glycan redesign. In addition, our current work and future developments in glycomics-based therapeutics will be presented, which are approached in three distinct but related subfield; the glyco-engineering of host cells for humanized *N*-glycans^{1,2}, the development of *in vitro* glycan remodeling systems through use of specific glycan processing enzymes, and the establishment of high-throughput analysis system for glycan structure³.

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