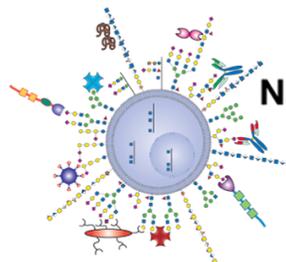


2/10/16

**Title: The National Center for Functional Glycomics (NCFG)**

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The P41 National Center for Functional Glycomics (NCFG) is developing and expanding new technologies to explore glycan recognition by glycan-binding proteins (GBPs), which include lectins and antibodies, and identifying biologically important glycans based on such recognition (<http://ncfg.hms.harvard.edu>). The NCFG is an outgrowth of the very successful



**National Center for  
Functional Glycomics**

Consortium for Functional Glycomics (CFG), an NIGMS-funded program that led to development of glycan microarray technologies, glycan libraries, and multiple databases, including glycan structures and interactions. The major focus of the NCFG is to collaborate with biomedical researchers to develop new formats for glycan microarrays, using both solid-phase and liquid-phase formats, and developing microarrays of new glycan libraries represent human and animal glycomes, and microbial glycomes. These formats allow for qualitative and quantitative characterization of glycan recognition. These unique methodologies that comprise the Technology Research & Development (TR&D) Projects include expansion of current glycan microarray technologies, such as defined glycans, glycosaminoglycans, glycopeptides, and glycolipids, and development of “shotgun glycan microarrays” representing the natural glycomes of cells and tissues. The unique technologies offered by the NCFG include: animal glycan microarrays, glycopeptide microarrays, microbial glycan microarrays, shotgun glycan microarrays, various displays of glycans and glycoconjugates differing in glycan presentation and valency, and immobilized glycans on cell-sized microspheres (*cellular avatars*), etc. The immobilized glycans can also be used to measure enzyme activities of glycosyltransferases or glycohydrolases that modify the glycans in specific ways, which can be detected by specific reagents. These new technologies are available to the research community and help promote exploration of the functional glycome, as well as providing libraries of glycans from natural sources for sequencing various glycomes. Currently, the NCFG has multiple Driving Biomedical Projects and Collaborative Projects, that range from studies on glycan recognition by viruses, human and mouse Siglecs, C-type lectins, galectins, mannose-6-phosphate receptors, microbial adhesins, anti-glycan antibodies, and development of new technologies for expressing and presenting glycans for recognition. In addition, the Center is devoted to developing new bioinformatics tools to help access the information from glycan microarray studies and other aspects of glycan structures in the general area of glycomics. All of the results of the Center, as well as services in this research area, are available publicly through databases developed through the combined efforts of the CFG and the NCFG ([www.functionalglycomics.org/](http://www.functionalglycomics.org/)). We are also working with other NCCR Centers, e.g. Integrated Technology Resource for Biomedical Glycomics, to promote studies on the structures and functions of human and animal glycomes, and expand the bioinformatics databases about glycan structures and their recognition. Furthermore, the NCFG is developing rigorous educational programs in the area of protein-glycan interactions.

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