

Development of functional carbohydrate microarray platform for carbohydrate-protein interaction

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A carbohydrate microarray based on glass or other transparent surfaces has been suggested as a potential tool for high-throughput analysis of carbohydrate-protein interactions. Here we proposed a facile, efficient, and cost-effective method whereby diverse carbohydrate types are modified in a single step and directly immobilized onto a glass surface, with retention of functional orientation. We modified various types of carbohydrates by reductive amination, in which reducing sugar groups were coupled with 4-(2-aminoethyl)aniline, which has di-amine groups at both ends. The modified carbohydrates were covalently attached to an amino-reactive NHS-activated glass surface by formation of stable amide bonds. This method was applied for construction of functional carbohydrate microarray platform to analyze carbohydrate-protein interactions. This array by using our method can be powerful tool for screening the specificity of GBPs (glycan-binding proteins) such as lectins, growth factors, antibody, and microbial toxins, and identification of carbohydrate-protein interactions.