



Applications

- A tool to advance glycobiology research
- A potential diagnostic for diseases such as cancer and diabetes

Benefits

- Reproducible results with a small sample volume
- High sensitivity
- Amenable to high-throughput analyses

VARI IP-00046

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Methods for Detecting Protein Glycosylation

A glycan-based antibody array capable of identifying characteristic disease-associated sugars that could serve as biomarkers.

Background

Proteins perform various functions within cells. Post-translational modifications of proteins provide cells a means to modify proteins' standard functions. These modifications involve the addition of certain chemical groups or molecules to the protein, such as the addition of a sugar (a glycan) to create a glycosylated protein.

Prevention, early detection (through more precise diagnostic tools), and personalized care are significant areas of focus for the healthcare industry. With an annual growth rate of 3 percent, diagnostic tools currently have a market size of \$50 billion. Given this push toward personalized medicine, there is significant potential for new technology-based assays. Most of the commonly used traditional diagnostic approaches have been DNA- or protein-based. In last decade, researchers have discovered that certain post-translational modifications can serve as biomarkers for many diseases, including various forms of cancer; however, evaluating these slight alterations can be costly and requires much effort.

Technology

Van Andel Research Institute (VARI) scientists have successfully developed an easy-to-use, high-throughput assay that reliably identifies disease-associated glycans. The assay's microarray platform is made with immobilized capture antibodies and is divided into multiple microarrays to process a large number of samples and replicates at one time, making it a highly efficient and cost effective approach. Each set of spatially organized and immobilized antibodies binds to specific proteins from an incubated biological sample and, during a second incubation, glycan-binding proteins known as lectins interact with specific glycans present on captured proteins. Thus, variation in glycans on multiple proteins from different samples can be examined in one assay.

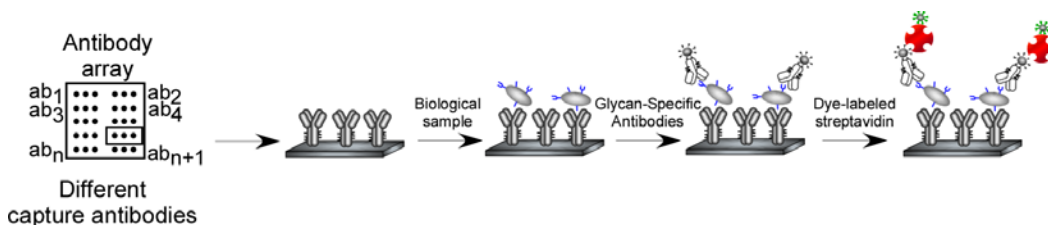


Figure 1: *The antibody-glycan microarray.* This high-throughput assay can process many samples at the same time. Immobilized antibodies capture specific proteins and protein glycosylation is identified using glycan-binding proteins (lectins).

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