NISTTech

Glycoprotein – Colloidal Particle Conjugates

Fast method for identifying the composition of glycoproteins

Description

The invention is a method for preparing and identifying the composition and structure of oligosaccharides attached to proteins, i.e., glycoproteins. The method can include the steps of immobilizing glycoproteins to colloid particles; using the glycoprotein/colloidal particles with sugar binding proteins such as lectins in an optical assay for identifying and screening oligosaccharides attached to the protein; or cleaving the oligo saccharides from the immobilized glycoproteins, thereby releasing oligo saccharides for further analysis by chromatography or mass spectrometry.

The inventors found that certain glycoproteins, specifically but not necessarily limited to polyclonal or monoclonal antibodies, spontaneously and strongly adsorb in a denatured state on gold nanoparticles. We speculate that the strong adsorption and denaturation result from the formation of gold-thiolate bonds from dissociation of many of the 16 disulfide groups present in classes of IgG antibodies. The relatively hydrophilic oligosaccharide structures (also known as carbohydrates, sugars, or glycans) of the adsorbed glycoprotein are then well presented to the aqueous solution for potential probing by biological binding or enzymatic reactions.

Abstract

A method of characterizing glycans attached to glycoproteins is provided herein. The method comprises a first step of immobilizing the glycoproteins on colloidal particles forming glycoprotein/colloidal particles. The glycans on the glycooproteins may then be identified by either binding the glycoprotein/colloidal particles with one or more binding agents and assessing the aggregation of the glycoprotein/colloidal particles or by cleaving glycans from the glycoprotein/colloidal particles with a cleaving agent and analyzing the glycans.

Inventors

- Tarlov, Michael J.
- Zangmeister, Rebecca A.
- Morris, Todd A
- Sanchez-Pomales, Germarie

Citations

1. T.A. Morris, A.W. Peterson, M.J. Tarlov, Selective Binding of RNase B Glycoforms by Polydopamine-Immobilized Concanavalin A, Anal. Chem. American Chemical Society 81 (13) pp 5413-5420, 2009.

References

- U.S. Patent Application PDF
- Docket: 09-016

Status of Availability

available for licensing

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