

Bandaru, N. M.; Voelcker, N. H.; Jayaraman, N., 2006, "Surface plasmon resonance studies of bivalent and monovalent  $\alpha$ -D-mannopyranoside glycolipids-lectin interactions", *Glycobiology*, 16, 822 – 832.

This Article reports systematic kinetic studies of bivalent and monovalent sugar containing glycolipids and their interactions with a lectin. The clustered nature of a sugar ligand and its presentation are known to play a crucial role in its effective interaction with a lectin. Clustering sugar ligands has set a paradigm in approaches to study carbohydrate-protein interactions in general. Various inhibition and thermodynamic studies have been performed previously that allow realizing the details of ligand design and energetic parameters governing this class of biomolecular interaction. The purpose of the present investigation is to assess the kinetics of carbohydrate-protein interactions, with the aid surface plasmon resonance. As multi- or oligovalency of sugar unit at the molecular level is essential, several bivalent sugar containing glycolipid micelles were involved. For a comparison purpose, monovalent glycolipids micelles were utilized. After establishing the micelle formation, binding kinetics of the glycolipids with lectin concanvalin A was performed. The most important outcome of these studies is the identification of kinetic on-off rates, which are significantly favorable for the bivalent glycolipids than the monovalent glycolipids. The present results are important and contribute in a fundamental manner about multivalency in glycolipid-protein interactions. The results presented herein should be useful in sustained efforts towards biosensor development, construction of sugar ligands in solid matrices and of multi-layers consisting of alternate layers of sugar-lectin complexes.