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Roles of polyvalency in the mechanism of glyco recognition: An important direction for the future glycosciences

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Lectins are an important class of proteins or glycoproteins that specifically or selectively bind to carbohydrates and play many critical roles in life processes. In order to characterize recognition roles of lectins, the following aspects have been taken into consideration: 1. Lectins affinity to monosaccharides; 2. Expression of reactivity's toward oligosaccharides (mammalian structural units/recognition units) and finding the most active ligand. However, it is not satisfied because most lectins with the same mono or oligosaccharide specificity may demonstrate different specificities in reaction with polyvalent forms-it has even shown a shift of binding specificity of lectin from one type of carbohydrate ligand to another when the density of the specific carbohydrate changed. Therefore, characterization of lectin specificity has been extended to: 3. Simple oligovalent or cluster effect; and 4. Complex multivalent or cluster effects. Simple oligovalent effect concerns the reactivity of lectins with oligomeric glycoconjugates (e.g. branched oligosaccharides carrying several active disaccharides, glycopeptides with several T α or T n glycotopes). A complex multivalent effect applies to interaction with high-molecular or aggregated molecules carrying multiple glycotopes recognized by a lectin. In this talk, we are focusing on the resulting intensities of three basic recognition factors: 1. Essential mammalian structural units, 3. their clusters and 4. Poly-valency in the recognition processes.

Biography

Albert M Wu obtained his PhD degree with W Pigman, who is the pioneer in glycoproteins, at New York Medical College; and had his Postdoctoral training at E.A. Kabat's Lab for Quantitative Immunochemistry, Columbia University Medical Center, New York. He joined as a faculty position at Texas A&M University in 1982; promoted as a Full Professor at Chang-Gung University since 1989; and as Emeritus Professor in 2011. He has published over 120 polyvalent glycotopes related papers. He is the Chief Editor for three volumes of *Molecular Immunology of Complex Carbohydrates 1 to 3* in Adv. Exp. Med. Biol. 228, 451, 705 (Springer Publisher). His major interests are Glycan purification and characterization, recognition factors of glycans and combining sites of lectins and antibodies. He received many Outstanding Research Awards (1997-2008) from government agents in Taiwan.

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