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Jose Kovensky

University of Picardy Jules Verne, CNRS, France

Synthesis and evaluation of multivalent thio-glycoclusters

Carbohydrate–protein interactions govern a wide variety of life processes and play an essential role triggering several biological events. Taken one by one, sugar-protein interactions are intrinsically weak and this is overcome in nature by multivalent contacts, characterized by an enhancement of the affinity when sugar ligands are presented in a cluster. Several biomimetic approaches have been developed in order to prepare synthetic multivalent neoglycoconjugates to interfere with a series of pathological events such as infections due to viruses and bacteria, tumor progression and migration, and inflammation processes. We synthesized multivalent glycoconjugates on oligosaccharide scaffolds, to obtain structures with improved hydrophilicity and pharmacokinetics, as compared to peptidic, aromatic, or polymeric scaffolds. We prepared glycoclusters carrying S-glycosides, showing higher stability towards glycosyl hydrolases than O-glycosides. S-galactosides, S-lactosides, 3-deoxy-S-lactosides and analogues of dithiogalactoside (a commonly used galectin inhibitor) afforded new multivalent glycoclusters to obtain high affinity ligands for the lectins (concanavalin A, PNA, galectins).

Biography

Jose Kovensky has obtained a PhD from the Universidad de Buenos Aires (Argentina, 1992). He did his Post-doctorate research at the École Normale Supérieure (Paris, France, 1994–1995). After being Professor of Organic Chemistry in Argentina, he got a Full Professor position in Amiens in 2002. He has been a Principal Investigator of several projects (Picardie Region, CNRS, ANR, EU). He has Directed or Co-directed 12 PhD theses. He is Co-Author of more than 80 publications (articles, book chapters, patents). He has a wide experience in the synthesis and modification of oligosaccharides, uronic acid containing oligosaccharides, sulfonated oligosaccharides, glycosaminoglycans, multivalent glycoclusters, sugar-based surfactants.

jose.kovensky@u-picardie.fr

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