SYNTHESIS OF MULTIVALENT CHONDROITIN SULFATE OLIGOSACCHARIDES TO EXPLORE CS-PROTEIN INTERACTIONS

Christopher Herailh[a], E.Treuillet[a], P.Buisson[a], R.Daniel,[b] F. Lecaille,[c] M.Schuler[a], C. Lopin-Bon[a]

[a] Institut de Chimie Organique et Analytique (ICOA), UMR 7311 CNRS et Université d'Orléans, BP6759, 45067 Orléans cedex 02, France
christopher.herailh@univ-orleans.fr
[b] Laboratoire LAMBE, UMR 8587 CNRS et Université Evry-Val-d'Essonne, 91025 Evry, France
[c] Centre d'Etude des Pathologies Respiratoires (CEPR), UMR INSERM U 1100, 37032 Tours cedex 1, France

Chondroitin sulfate (CS) are heteropolysaccharides that belong to a family of complex polyanionic polymers called glycosaminoglycans (GAGs). They consist of a repeating disaccharide unit composed of a D-glucuronic acid (D-GlcA) and 2-acetamindo-2-deoxy-D-galactose (D-GalNAc) and bearing sulfate groups primarily at the position 4 (CS-A) and/or position 6 (CS-E/CS-C) of the D-GalNAc [1]. Their structural diversity and sulfation patterns determine their biological functions, including neuronal development, morphogenesis, and cell-cell recognition, through interactions with various proteins [2]. Additionally, CS are major structural components of connective tissues, particularly in cartilage, skin, and bone [3]. Multivalency is a key feature in glycan-protein interactions, enhancing both affinity and specificity while enabling supramolecular organization at the cell surface [4]. Despite its importance, multivalent CS constructs remain scarce [5]. Here, we present our approach, for the synthesis of well-defined CS oligosaccharides with controlled sulfation [6] patterns and various linkage systems and platforms to promote multivalency.

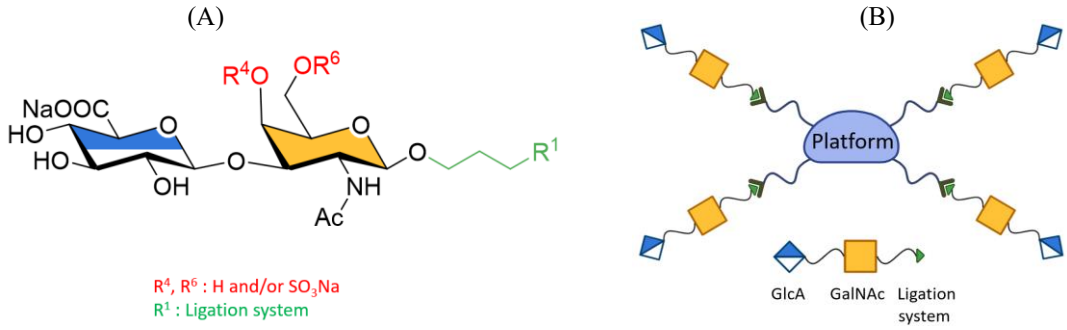

Figure 1. (A) Structure of CS disaccharide, (B) Multivalent CS oligosaccharides

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