

CHEMICAL EXTENSION AND GLYCOTENDRIMER FORMATION OF THE MATRIGLYCAN DECASACCHARIDE, (-3Xyl α 1-3GlcA β 1-)₅ AND ITS AFFINITY FOR LAMININ

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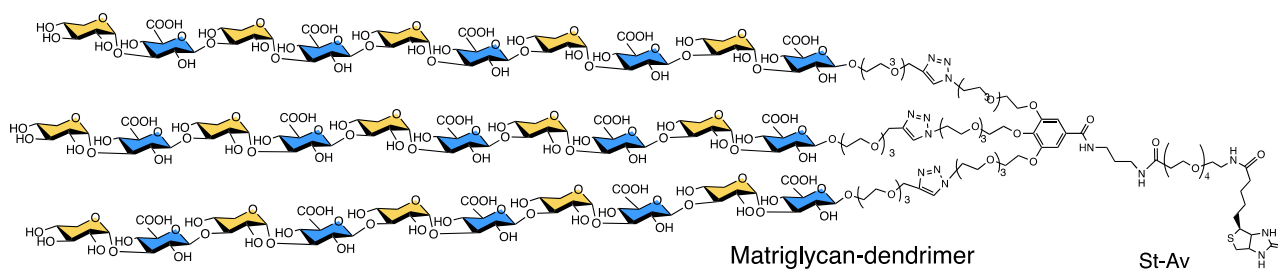
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Muscle tissue is stabilized by the strong interaction between laminin and matriglycan. Matriglycan is a polysaccharide composed of the repeating disaccharide, -3Xyl α 1-3GlcA β 1-, and is a pivotal part of the core M3 O-mannosyl glycan. Patients with muscular dystrophy cannot synthesize matriglycan or the core M3 O-mannosyl glycan due to a defect in or the lack of glycosyltransferases owing to glycan synthesis. We herein report the synthesis of a matriglycan-repeating decasaccharide and a dendrimer comprising three branches of the decasaccharide. The glycan was regio- and stereoselectively synthesized by the stepwise addition of the corresponding disaccharide unit. The immobilized decasaccharide and glycotendrimer on the sensor tip via biotin and streptavidin bound to laminin-G-like domains 4 and 5 of laminin- α 2. The dissociation constants of the decasaccharide and dendrimer obtained from bio-layer interferometry (BLI) were estimated to be 4.4×10^{-8} M and 6.8×10^{-8} M, respectively, showing higher affinity than those of a matriglycan-repeating hexasaccharide (1.6×10^{-7} M) and the dendrimer (1.8×10^{-7} M) [1].



Reference:

1. K. Kotera, R. Miyamoto, G. Mochizuki, T. Tamura, N. Manabe, Y. Yamaguchi, J. Tamura, *Carbohydr. Res.* **2025**, 547, 109328.