Syndecan-1 binds collagen types I, III, V

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Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

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Literature references

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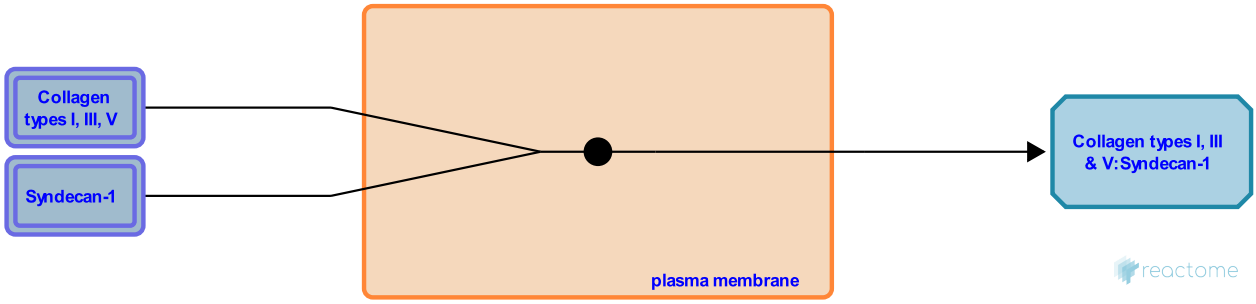
Stable identifier: R-NUL-2731094

Type: binding

Compartments: plasma membrane, extracellular region



Syndecans are type I transmembrane proteins, with an N-terminal ectodomain that contains several consensus sequences for glycosaminoglycan (GAG) attachment and a short C-terminal cytoplasmic domain. Syndecans have attached heparan sulfate (HS) and to a lesser extent chondroitin sulfate (CS) chains. These allow interactions with a large number of proteins. Various enzymes involved in post-translational HS chain modifications produce unique binding motifs that selectively recognize different proteins (Tkachenko et al. 2005). HS chains facilitate interactions of syndecan-1 with extracellular matrix proteins, including several types of collagen (type I, III and V - Koda et al. 1985). It is thought that syndecans often act in concert with other receptors, e.g. alphavbeta3 and alphavbeta5 integrins cooperate with syndecan-1 during adhesion to vitronectin (Beauvais et al. 2004, McQuade et al. 2006) while alpha2beta1 and alpha6beta4 integrins cooperate with syndecans during adhesion to laminin (laminin alpha-1 Hozumi et al. 2006, laminin gamma-2, Ogawa et al. 2007). Similarly syndecan-1 appears to support integrin alpha2Beta1-mediated adhesion to collagen (human to cow collagen I - Vuoriluoto et al. 2008). This relationship between syndecans and co-receptors is not well understood (Alexopoulou et al. 2007). Syndecan-null mice have subtle phenotypes when compared with mice deficient in HS chain synthesis or modification (Echtermeyer et al. 2001, Ishiquro et al. 2001, Götte et al. 2002).

Literature references

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Editions

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