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Poster 9

Solution Structure of the Cell Adhesion Matrix Protein, Syndecan-4 Cytoplasmic domain

Joon Shin¹, Donghan Lee¹, Eok-soo Oh², Anne Woods²,
John R Couchman², and Weontae Lee

¹Department of Biochemistry, College of Science, Yonsei University, Seoul, Korea and ²Department of Cell Biology and the Cell Adhesion & Matrix Research Center, University of Alabama at Birmingham

Syndecan-4, a transmembrane heparan sulfate proteoglycan, is a coreceptor with integrins in cell adhesion. It has been suggested to form a ternary signaling complex with protein kinase C and phosphatidylinositol 4,5 biphosphate (PIP₂). Syndecans each have a unique, central and variable (V) region in their cytoplasmic domains and that of syndecan-4 is critical to its interaction with PKC α and PIP₂. Whole domain (4L) of syndecan-4 cytoplasmic domain were synthesized for structural studies. The solution conformations of free 4L have been determined by two-dimensional NMR spectroscopy and dynamical simulated annealing calculations. RMSD values between backbone atom coordinates for regions from Lys3 to Ala21 is 1.8Å and, 0.77Å for variable region. In contrast to variable region, whole cytoplasmic domain exists as a monomeric conformation in solution and highly charged polar residues were mostly exposed to solvent. The overall three-dimensional structure of 4L in solution exhibits a twisted ribbon shape having a cavity in the center of peptide.