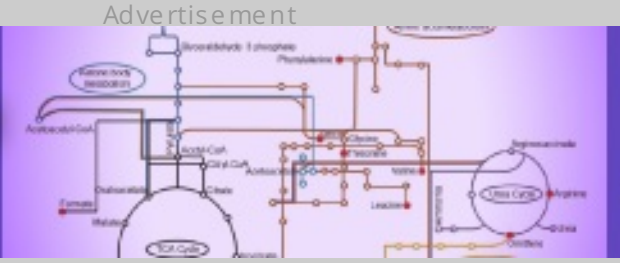

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Interactions of the Amino-terminal Noncollagenous (NC1) Domain of Type VII Collagen with Extracellular Matrix Components

A POTENTIAL ROLE IN EPIDERMAL-DERMAL ADHERENCE IN HUMAN SKIN*

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Abstract

Type VII collagen, the major component of anchoring fibrils, consists of a central collagenous triple-helical domain flanked by two noncollagenous domains, NC1 and NC2. The NC1 domain contains multiple submodules with homology to known

adhesive molecules including fibronectin type III-like repeats and the A domain of von Willebrand factor. In this study, we produced the entire NC1 domain of human type VII collagen in the stably transfected human kidney 293 cell clones and purified large quantities of the recombinant NC1 protein from serum-free culture media. The recombinant NC1 formed interchain disulfide-bonded dimers and trimers and was *N*-linked glycosylated. Tunicamycin inhibited the cellular secretion of NC1, suggesting that *N*-linked glycosylation may play a role in NC1 secretion. The recombinant NC1 was indistinguishable from the authentic NC1 obtained from human amnions or WISH cells with respect to *N*-linked sugar content, electrophoretic mobility, rotary shadow imaging, and binding affinity to type IV collagen. Purifiedrecombinant NC1, like authentic NC1, also bound specifically to fibronectin, collagen type I, and a laminin 5/6 complex. Both monomeric and trimeric forms of NC1 exhibited equal affinity for these extracellular matrix components, suggesting that the individual arms of NC1 can function independently. The multiple interactions of NC1 with other extracellular matrix components may support epidermal-dermal adhesion.

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