A unique sequence of the laminin α3 G domain binds to heparin and promotes cell adhesion through syndecan-2 and -4
Atsushi Utani
Department of Dermatology, School of Medicine, Chiba University

Laminin-5, consisting of the α3, β3 and γ2 chains, is localized in the skin basement membrane. The α chains of laminins have been shown to have various biological activities. In this study, we identified a sequence of the α3 chain C-terminal globular domain (LG1-LG5 modules) required for both heparin binding and cell adhesion using recombinant proteins and synthetic peptides. We found that the LG3 and LG4 modules have activity for heparin binding and that LG4 has activity for cell adhesion. Studies with synthetic peptides delineated the A3G75αR sequence within LG4 as a major site for both heparin and cell binding. Cell adhesion to LG4 and A3G75αR was inhibited by heparitinase I treatment of cells, suggesting that cell binding to the A3G75αR site was mediated by cell surface heparan sulfate proteoglycans. We showed by affinity chromatography that syndecan-2 from fibroblasts bound to LG4. Solid-phase assays confirmed that syndecan-2 interacted with the A3G75αR peptide sequence. Stably transfected 293T cells with expression vectors for syndecan-2 and -4 specifically adhered to LG4 and A3G75αR. These results indicate that the A3G75αR sequence within the laminin α3LG4 module is responsible for cell adhesion and suggest that syndecan-2 and -4 mediate this activity.