GS02-2 Cell Adhesive Peptides as a Useful Tool for Tissue Engineering

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Tissue engineering is one of the pharmaceutical sciences, that aims to develop the functional materials for retaining and improving the tissue functions. While a lot of works had been studied to construct cell adhesive materials, it is difficult to control the compatibility and the dynamic profile correlating with different organs, stages, and cell types. The extracellular matrix (ECM) supports the cell dynamics as a scaffold and gives the appropriate environment to the cell specific manner in vivo. We have been focusing on basement membranes, which are thin ECM and play a critical role in various biological activities such as development or regeneration. Previously, we have identified various cell adhesive peptides from laminins, a major component of basement membranes. These peptides recognize various cell surface receptors and have a potential to serve as a biomaterial for tissue engineering. Here, we designed artificial basement membrane by conjugating the peptides to polysaccharides. We used four laminin-derived synthetic peptides (A99: bind to integrin αvβ3, EF1zz: bind to integrin α2β1, AG73: bind to syndecan, and C16: bind to integrin and syndecan) and used chitosan and alginate as a polysaccharides scaffold. Their biological activities were examined using the various cells. We found that the complexes exhibited biological activities, and the activities are different depend on peptides and on physical properties of the polysaccharides. These results suggested that the laminin-derived peptides have a potential to develop artificial basement membranes by conjugating to polysaccharides and are useful for tissue engineering.