

Functional effect of laminin α chains on endocrine cells in rat anterior pituitary gland

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Basement membrane proteins play important roles for cells as adherent extracellular scaffolds and signal transduction factors via integrins. Laminin, a major component of the basement membrane, is comprised of three subunits, α , β , and γ chains. Among these chains, only laminin α chain is capable of signaling via integrins. Previously, we studied components of the basement membrane in rat anterior pituitary gland, and found that laminin $\alpha 1$, $\alpha 3$, and $\alpha 5$ chains are located in the basement membrane on the parenchymal cell side, but not in the endothelial cell side. However, the effect of laminin on endocrine cells in the gland is not clear. In order to elucidate this issue, dispersed rat anterior pituitary cells were cultured on laminins containing $\alpha 1$, $\alpha 3$, or $\alpha 5$ chains as ligands. Cultured cells adhered to laminin containing $\alpha 3$ or $\alpha 5$, and the morphology of these cells changed to flat shape. Double-immunostaining showed that endocrine cells express integrin $\beta 1$ and $\alpha 3$. The antibody against integrin $\beta 1$ blocked the morphological change of the cells. Furthermore, we found that adhesion to laminins containing $\alpha 3$ or $\alpha 5$ induced growth hormone release from rat anterior pituitary cells. These findings show that laminin $\alpha 3$ and $\alpha 5$ play a functional role as a signaling molecule to regulate endocrine cells in rat anterior pituitary gland.