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## The effect of RGDcontaining elastinmimetic polypeptide on neuroblastoma cellular behaviors

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Division of NanoBio Technology, Laboratory of Biochemistry and Cellular Engineering Daegu Gyeongbuk Institute of Science and Technology, South Korea Elastin-like polypeptides (ELPs) are consist of VPGXG pentapeptide (X is the guest position for any amino acid except proline) derived from the VPGVG sequence found in a natural matrix protein tropoelastin. Neuronal cells require contact sites within their surrounding matrix for not only initial cell attachment, but long-term differentiation and neuronal morphogenesis as well. In natural ECM environment, the cell adhesions sequences or domains found in various types of ECM proteins provide contact sites and regulate neuronal cell behaviors through the interaction with cell-surface receptors. Among them, Arg-Gly-Asp (RGD) tripeptide derived from fibronectin, vitronectin and collagen is a potent integrin binding ligand associated with adhesionmediated cell motility and neurite elongation during neuronal cell differentiation.

In this study, an RGD-containing elastin-mimetic polypeptide TGPG [VGRGD (VGVPG) 6] 20WPC is referred to as [RGD-V6] and protein surfaces were prepared by isothermal adsorption of [RGDV6]20 and fibronectin on tissue culture polystyrene. The effects of protein coated surfaces at 4°C on N2a cellular behaviors were quantitatively measured to investigate its potential feasibility as a biomimetic analogue of natural matrix proteins. The [RGD-V6]20 polypeptide enhanced N2a cell attachment, and consistent with the cell adhering activity, increased migration speed and neurite outgrowth in a manner similar to native fibronectin. Also, the expression levels of  $\alpha 3$ ,  $\alpha 5$ ,  $\alpha v$ ,  $\beta 1$ , and 3 integrin subunits in the N2a cells grown on [RGDV6]20 were quantified by RT-PCR, and were statistically not different from those cultured on polystyrene surface. Adhesion-mediated enhancement in cell migration and differentiation is generally desired in tissue regeneration. In this context, the [RGD-V6]20 polypeptide can provide a bioactive matrix for neuronal cell engineering or to improve longterm biocompatibility of tissue implant devices. But, the effects of protein coated surfaces at 37°C on N2a cellular behaviors are different compared with those of protein coated surfaces at 4°C. Cells form the spheroid and are not differentiated. These changes are alike with results of human neuroblastoma, SH-SY5Y culture on the protein coated surfaces at 37°C. Morphology of SH-SY5Y is similar with that of N2a. Moreover, the expression levels of integrin subunits also are decreased on the protein coated surfaces at 37°C. Threfore, we concluded RGD-functionalized ELP affect differently morphology and differentiation of neuroblastoma cell according to protein coating temperature via the expression of integrins. We think that the differences of cellular morphology according to the RGD-functionalized ELP coating temperature are used as experimental tool in other experiments.

## Biography

Dr. Jung completed his Ph.D at the age of 28 years from Keimyung University, College of Medicine in South Korea. She has published 4 papers. Now, she works at Daegu Gyeongbuk Institute of Science and Technology as a postdoctoral researcher.