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Proliferation, Migration and Adhesion of Hs683 Human Glioma Cells

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In an attempt to provide useful information on the development of an artifitial nerve tubing, proliferative and migrative properties of two glioma cell lines, C6 rat glioma cells and Hs683 human glioma cells, were examined. The present study shows that C6 cells proliferated more rapidly than Hs683 cells. The Hs683 cells are more adequate for the development of nerve tubing since unlike C6 cells, they are of human origin and known to be non-tumorigenic. In order to enhance proliferative and migrative abilities of Hs683 cells for the application as an artificial nerve tubing, we studied the effect of glial cell-derived neurotrophic factor (GDNF) on C6 and Hs683 cells. GDNF increased proliferation and migration of Hs683 cells in a dose-dependent manner. As an approach to develop artificial nerve tubing, we wished to determine if GDNF stimulate proliferation of glioma cells in the scaffolds. Cells were seeded in the scaffolds (polymer constructs), fabricated with type I collegen and alginate modified with cinnamoyl moiety, in the presence or absence of GDNF. Compared to control, cell proliferation was greatly enhanced by GDNF treatment of scaffolds as evidenced by staining of the cells in paraffin block. We then tested cytotoxicity of scaffolds used in this study. Hs683 cell growth was not inhibited by scaffold, proving that scaffold is not cytotoxic. Taken together, we show that GDNF treatment of scaffolds effectively increased Hs683 cell proliferation, suggesting a possible use of GDNF for developing artificial nerve tubing. We also examined the effect of different extracellular matrix (ECM) proteins on the adhesive property of Hs683 cells. Using *in vitro* adhesion assays performed on purified ECM components, we show that adhesion of Hs683 cell was significantly increased on fibronectin and tenascin.