

Investigation of Astrocyte Physiology on Stiffness-Controlled Cellulose Acetate Nanofiber as a Tissue Scaffold

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Abstract : Astrocytes are known as dominant cells in CNS and play a role as a supporter of CNS activity and regeneration. Recently, three-dimensional culture of astrocytes were actively applied to understand in vivo astrocyte works. Electrospun nanofibers are attractive for 3D cell culture system because they have a high surface to volume ratio and porous structure, and have already been used for 3D astrocyte cultures. In this research, the stiffness of cellulose acetate (CA) nanofiber was controlled by heat treatment. As stiffness increased, astrocyte cell viability and adhesion increased. Reactivity of astrocyte was also upregulated in stiffer CA nanofiber in terms of GFAP, an intermediate filament protein. Finally, we demonstrated that stiffness-controllable CA is attractive for astrocyte tissue engineering.

Keywords : astrocyte, cellulose acetate, nanofiber, tissue scaffold

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