

Behavior of hFOB 1.19 Cells in Injectable Scaffold Composing of Pluronic F127 and Carboxymethyl Hexanoyl Chitosan

Authors : Lie-Sian Yap, Ming-Chien Yang

Abstract : This study demonstrated a novel injectable hydrogel scaffold composing of Pluronic F127, carboxymethyl hexanoyl chitosan (CA) and glutaraldehyde (GA) for encapsulating human fetal osteoblastic cells (hFOB) 1.19. The hydrogel was prepared by mixing F127 and GA in CA solution at 4°C. The mechanical properties and cytotoxicity of this hydrogel were determined through rheological measurements and MTT assay, respectively. After encapsulation process, the hFOB 1.19 cells morphology was examined using fluorescent and confocal imaging. The results indicated that the Tgel of this system was around 30°C, where sol-gel transformation occurred within 90s and F127/CA/GA gel was able to remain intact in the medium for more than 1 month. In vitro cell culture assay revealed that F127/CA/GA hydrogels were non-cytotoxic. Encapsulated hFOB 1.19 cells not only showed the spherical shape and formed colonies, but also reduced their size. Moreover, the hFOB 1.19 cells showed that cells remain alive after the encapsulation process. Based on these results, these F127/CA/GA hydrogels can be used to encapsulate cells for tissue engineering applications.

Keywords : carboxymethyl hexanoyl chitosan, cell encapsulation, hFOB 1.19, Pluronic F127

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