عنوان مقاله:

Investigating the Impact of Alumina on Physical, Mechanical, and Biological Properties of Electrospun Polyhydroxybutyrate-Keratin Scaffold Utilizedin Bone Tissue Engineering

محل انتشار:

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خلاصه مقاله:

Electrospun nanofiber scaffolds have a similar structure to ECM, leading to increased cell adhesion, proliferation, and migration. In this study, ۱-۵ wt. % of alumina nanowires were added to Polyhydroxybutyrate-Keratin (PHB-K) solution, and the morphology of the electrospun scaffolds in terms of fiber diameter, porosity percentage, and the uniformity of the alumina nanowires distribution was evaluated by SEM. FTIR and Raman tests werealso used to evaluate the chemical bonds of nanofibers and the presence of alumina and keratin in electrospun scaffolds. The crystallinity of the scaffoldswas also measured using DSC and confirmed by XRD. The increase of alumina augmented the crystallinity of scaffoldsbecause alumina is a nucleating agent. The tensile strength of PHB-K scaffolds increased up to ۳ fold in the presence of ۳ %wt of alumina.The MG۶۳ cells survived, and the secretion of alkaline phosphatase and mineralization due to the presence of alumina was significantly higher than PHB and PHB-K scaffolds. Based on the .results, the electrospun PHB-K/AL۲O۳scaffolds are potential candidates for bone tissue engineering

کلمات کلیدی:

.Electrospinning, Poly-hydroxybutyrate, keratin, Alumina nanowire