

عنوان مقاله:

Comparison of Structural Modification and Argon Plasma Treatment of Poly(lactide-co-glycolic acid) Nanofibrous Scaffolds for Cell Culture

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خلاصه مقاله:

Since poly(lactide-co-glycolic acid) (PLGA), as a biodegradable material, is a hydrophobic polymer which might lead to the incoherence of optimal growth of cells on the scaffold, the scaffold surface modification can promote the cell growth and proliferation. In this study, two methods including structural modification and plasma treatment were employed to improve the surface properties and epithelial kidney cells (Vero) culture efficiency for the PLGA nanofibrous scaffolds. Moreover, the physical, and chemical properties of the modified scaffolds were characterized. Plasma treatment enhances surface hydrophilicity and structural modification improves physical properties of surface such as fiber diameter, surface porosity and alignment index. It was found that the plasma-treated scaffold is more hydrophilic compared to the structurally-modified and non-treated scaffolds. From the ATR-FTIR spectra of the samples, it was observed that the extent of C=O and C-O groups was increased in the plasma-treated samples in comparison with the other groups. Furthermore, in-vitro studies demonstrated that, despite the greater hydrophilicity of the plasma-treated scaffold, both of modified scaffolds enhanced the cell growth and proliferation of Vero cells. In conclusion, the structurally-modified scaffolds have shown a promising potential to improve the cell proliferation as compared with the plasma-modified scaffolds.

کلمات کلیدی:

electrospun nanofibrous scaffold, Hydrophilicity, Surface modification, Structural modification, plasma-treated scaffold

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