

Nanostructured Materials from Hydroxyethyl Cellulose for Skin Tissue Engineering

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ABSTRACT

In this study, a novel fibrous membrane of hydroxyethyl cellulose (HEC)/poly(vinyl alcohol) blend was successfully fabricated by electrospinning technique and characterized. The concentration of HEC (5%) with PVA (15%) was optimized, blended in different ratios (30–50%) and electrospun to get smooth nanofibers. Nanofibrous membranes were made water insoluble by chemically cross-linking by glutaraldehyde and used as scaffolds for the skin tissue engineering. The microstructure, morphology, mechanical and thermal properties of the blended HEC/PVA nanofibrous scaffolds were characterized by scanning electron microscope, Fourier transform infrared spectroscopy, differential scanning calorimetry, universal testing machine and thermogravimetric analysis. Cytotoxicity studies on these nanofibrous scaffolds were carried out using human melanoma cells by the MTT assays. The cells were able to attach and spread in the nanofibrous scaffolds as shown by the SEM images. These preliminary results show that these nanofibrous scaffolds that supports cell adhesion and proliferation is promising for skin tissue engineering.

KEYWORDS: Electrospinning; Hydroxyethyl cellulose; Nanofibrous scaffolds; Skin tissue engineering

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