

عنوان مقاله:

Development of poly (ϵ -caprolactone)/gelatin/cellulose nanofiber composite scaffold for tissue engineering

محل انتشار:

اولین کنگره بین المللی مهندسی بافت و پزشکی بازساختی ایران (سال: 1397)

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خلاصه مقاله:

Introduction The main approach in tissue engineering involves the development and design of biocompatible and porous polymeric scaffolds with appropriate mechanical properties, stitch ability, degradability, and elasticity in order to produce functional three-dimensional substrate tissue rehabilitation. **Objectives** The aim of the present research was to study the reinforcing effect of cellulose nanofiber (CNF) addition to poly (ϵ -caprolactone) (PCL) /gelatin (Gel) (30:70) polymeric blend in fabricated nanofibrous composite scaffolds for tissue engineering. **Methods** Scaffolds were fabricated by electrospinning method and acetic acid/formic acid mixture was used as a solvent. The physical, morphological, and mechanical properties of PCL/Gel/cellulose nanofiber scaffolds were characterized by SEM, porometry, tensile, and contact angle measurement. In addition, the biodegradability of nanofibrous scaffolds was evaluated. **Results** It was found that CNF addition increases the electrospun fiber diameter, particularly at higher CNF contents. Moreover, the mechanical properties of composites were enhanced compared to the pure polymer which can be due to a strong interaction between CNF and PCL/Gel blend. Despite the presence of high levels of Gel, the degradation of scaffolds was reduced due to the presence of cellulose nanofibers. **Conclusion** The obtained results reveal the potential application of non-toxic, biocompatible, and biodegradable electrospun PCL/Gel/CNF fiber composite for tissue engineering.

کلمات کلیدی:

Tissue engineering, Poly (ϵ -caprolactone), Gelatin, Cellulose, Nanofiber

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