

## عنوان مقاله:

In-Vitro Evaluation of Novel Polycaprolactone/ Chitosan/ Carbon Nano Tube Scaffold for Tissue Regeneration

## محل انتشار:

مجله فیزیک و مهندسی پزشکی، دوره 12، شماره 4 (سال: 1401)

تعداد صفحات اصل مقاله: 8

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## خلاصه مقاله:

Background: Many patients lose their organs or tissues due to disease, trauma, or a variety of genetic disorders. Tissue engineering is a multidisciplinary science to regenerate or restore tissue or organ function and an appropriate scaffold is the first and certainly a crucial step in tissue engineering strategies. Objective: The purpose of this study is to fabricate and evaluate the in-vitro response of porous nano Polycaprolactone (PCL)/ chitosan/ multi-wall carbon nanotube (MWCNTs) scaffold for tissue regeneration. Material and Methods: In this experimental research, a novel scaffold containing MWCNTs in polycaprolactone/chitosan nanofibrous scaffold was synthesized by electrospinning technique. Results: According to scanning electron microscopy SEM images, by increasing the number of MWCNT in the scaffold by ۲%, the average diameter decreased significantly for fabricated scaffolds with ۵% MWCNTs. Based on the results, the scaffolds plunged from submicron to nanoscale fibers at about ۸۰ nm. In addition, by adding more MWCNT to the nanofibrous scaffold, the biodegradation rate was decreased by ۳۲%. However, mechanical characterization demonstrates that the higher level of MWCNT increases young modulus by ۹۶%, and ۳-(۴,۵-dimethylthiazol-۲-yl)-۲,۵-diphenyl-۲H-tetrazolium bromide (MTT) assay illustrated that MWCNTs could enhance bioactivity and cell- scaffold relationship in addition to alkaline phosphatase (ALP). Conclusion: MWCNT significantly improves the physical and mechanical properties of fabricated scaffolds and in-vitro assessment demonstrated that the prepared nanofibrous scaffold containing ۴% MWCNT could be a very useful biocompatible material for tissue engineering.

## کلمات کلیدی:

Multi-Wall Carbon Nano Tube, Electrospun Scaffold, Nanofibers, Chitosan, Polycaprolactone, Tissue engineering

## لینک ثابت مقاله در پایگاه سیویلیکا:

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