Extended Abstract

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Coaxial electrospinning of PEO/PCL Nanofibers containing Medicago sativa extract for wound healing applications

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Abstract:

Electrospun nanofibers have been found of great interest for tissue engineering due to their porous fibrous structure which is similar to the extra cellular matrix of biological systems. However, utilization of coaxial electrospinning is advantageous in fabricating drug eluting dressings with sustainable drug release.

This work aimed to promote these properties through incorporation of Medicago sativa extract in core/shell nanofibers of PEO/PCL for wound healing applications. Medicago extract was produced via drying, blending, maceration in ethanol, filteration and drying. The final extract was added to the core suspension. Core-shell nanofibers were prepared using suspensions of 12 w/w% PCL, and 6 w/w% PEO+Medicago as shell, and core respectively. The electrospinning parameters were 20-5 KV, distance of 12 cm, and the injection rate of 0.2 ml/h. The structure of nanofibers were studied by Scanning and Transmission Electron Microscopy. Cytocompatibility was studied by MTT assay. Uniform nanofibers were synthesized, with average diameter of 416.28±109.28, and 276.94±105.49 nm, in the absence and presence of Medicago, respectively. The increase in diameter was mainly due to enhanced conductivity of the suspension. The shell thickness, and core diameter were about 40 and 95 nm,respectively. The cell viability of the fibers in the absence and presence of Medicago were 93.82±12.35, and 145.08±10.01 after 72 hr. Alothough the cytocompatibility of Medicago containing nanofibers was lower in comparison to the neat ones, but was significantly high. This study shows that the core/shell nanofibers containing Medicago sativa extraxts synthesized via coaxial electrospinning process are potentially suitable candidates for wound healing applications.

Biography:

E. Tamjid has completed her PhD at Sharif University of Technology, Iran and postdoctoral studies from Universityof Toronto, Canada. She is currently an Assistant Professor of Nanobiotechnology, in Faculty of Biological Sciences, Tarbiat Modares University, Tehran, Iran. She has published more than 25 papers in reputed journals and has been serving as an editorial board member of Scientific Reports, Nature Publishers.

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