conferenceseries.com

4th International Conference on

Integrative Biology

July 18-20, 2016 Berlin, Germany

Hybrid PCL/chitosan scaffolds with micro and macro porosity

Hilal Turkoglu Sasmazel and **Ozan Ozkan**
Atilim University, Turkey

In this study, hybrid PCL/chitosan polymeric scaffolds have been developed by combining electrospinning, solvent casting and freeze drying techniques. The aim was to obtain a hybrid structure with micro and macro porosity. The fabrication of the scaffolds has been designed in three steps. In the first step, PCL solution, prepared by dissolving 15 weight% PCL in chloroform/methanol solvent (v/v, 75/25), was electrospun in order to obtain fibrous mats with microporous structure. In the second step, chitosan solution, dissolved in acetic acid, was cast into a Petri dish and the prepared PCL fibrous mat was immersed into the solution to combine PCL with chitosan. For a better integration of the chitosan solution to the pores of the PCL fibrous network, pressure was applied on top of the PCL mat. Finally, the samples were freeze-dried with two different pre-drying step, refrigerating and vacuum incubating, to obtain macropores, accompanying the micropores of the fibrous structure. These prepared scaffolds were found to have a structure similar to the natural extracellular matrix (ECM) with an average contact angle of 68.93±2.18o. The optimization of the fabrication parameters was carried out with naked eye observations, SEM analysis and mechanical testing. It was found that the scaffold, freeze dried for 24 hours, showed the highest Young's modulus and yield strength values. Additionally, thickness and water contact angle (CA) measurements, Fourier Transform Infrared Spectroscopy (FTIR) and PBS absorption/shrinkage studies were carried out to define physical and chemical properties of the developed scaffolds. Finally, the biocompatibility of the scaffolds was tested *in vitro* with MRC5 fibroblast cells regarding cell attachment and growth and the developed scaffold was found to have better biocompatibility than commercial tissue culture polystyrene.

Biography

Hilal Turkoglu Sasmazel is working in Metallurgical and Materials Engineering Department at Atilim University, Ankara, Turkey since 2007. Her areas of interest are biomaterials, nanomaterials, tissue engineering, polymeric and composite materials, materials surface modifications and characterizations. She was honored with TUBA-L'Oreal-UNESCO Young Women in Science Award in Materials Engineering in 2009. She has published 21 SCI research articles and has 31 conference presentations in the last 15 years. She is the Director of Polymer/Composite Materials, Biocompatibility of Biomaterials and Antibacterial Property Testing Laboratories at Atilim University. She is an MC Member and representative of Turkey in EU-COST MP1101, MP1206 and FP1405 actions.

hilal.sasmazel@atilim.edu.tr

Notes: