OP-C-319

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Room: Fez 2

THE EFFECT OF PROCESSING AND MOLECULAR WEIGHT OF POLY(ETHYLENGLYCOL) OF POLYLACTIDE-BASED SCAFFOLDS ON VIABILITY AND CELL ADHESION OF SK-HEP1 CELLS

G. Lo Re[a], R. Scaffaro[a]*, S. Rigogliuso[b], G. Ghersi[b]

[a] Dipartimento di Ingegneria Chimica, Gestionale, Informatica, Meccanica University of Palermo, Viale delle Scienze, ed. 6, 90128 Palermo, Italy and [b] Dipartimento di Biologia Cellulare e dello Sviluppo, University of Palermo, Viale delle Scienze, ed. 16, 90128 Palermo, Italy

**Corresponding author: roberto.scaffaro@unipa.it*

Biopolymer-based scaffolds can stimulate isolated cells to regenerate tissue with defined size and shape, and have been studied as supports for cell transplantation both in vitro and in vivo. Given their known biocompatibility and their modular kinetics of degradation, polylactides (PLA) are currently studied for their potential use as three-dimensional structure for tissue engineering. In order to enhance their flexibility and impact strenght, to tune the degradation rate and to promote the surface hydrophilicity of the PLA-based scaffold, numerous studies have been carried out on the possible modification of PLA bulk and surface, including blending and copolymerization with polyethylene glycol (PEG). In addition to biocompatibility, PEG can be also used to eliminate or at least to minimize the adsorption of proteins via steric repulsion. The purpose of this study is to evaluate the feasibility of a method combining melt-blending of polymers with leaching techniques for the preparation of a highly interconnected three-dimensional porous scaffold. More specifically, sodium chloride salt and PEG will be used as water soluble porogens to form porous poly(L,D-lactide)-based scaffolds. The morphological characterization of materials produced was performed by Scanning Electron Microscope. The study to assess the cytotoxicity of the materials produced by evaluation of viability and adhesion of SK-Hep1 cells seeded and grown in-vitro within the obtained three-dimensional porous structures.The results obtained confirm the feasibility of a method to prepare three-dimensional porous and interconnected structures that combines the melt processing and leaching techniques. The solubilization of crystalline phase (NaCl) and hydrophilic polymer phase rendered the materials porous and interconnected the biocompatible PLA-based matrices, without using any toxic solvent, making them, therefore, suitable for applications in tissue engineering. Vitality essays demonstrates that cells inside the scaffolds, under culture conditions used, have not cytotoxicity effects.