Tania Limongi et al., J Tissue Sci Eng 2015, 6:2
http://dx.doi.org/10.4172/2157-7552.S1.022

OMICS International
conferenceseries.com

4th International Conference on
Tissue Science and Regenerative Medicine
July 27-29, 2015 Rome, Italy

Fabrication of polycaprolactone (PCL) porous sponge scaffolds using a salt-leaching method

Tania Limongi[1], Victoria Shalabaeva[2], Natalia Malara[3], Valentina Trunzo[3], Andrea Giugni[1], Vincenzo Mollace[3], Hua Tan[1] and **Enzo di Fabrizio[1]**
[1]King Abdullah University of Science and Technology, KSA
[2]Istitutoltaliano di Tecnologia, Italy
[3]University Magna Graecia, Italy

Tissue engineering is a fast growing contest of multiple disciplines that aims to realize tissues and organs for the replacement through congenital defects, cancer, aging and trauma. As an interdisciplinary field, principles of materials science, chemistry, biomechanics, engineering, biology and medicine are vastly employed in regenerative medicine research. The use of biocompatible polymers for the design and the fast realization of low-cost micro fabricated scaffolds have the potential to solve the problem of the urgency of organs donation for patients requiring organ transplantation. The primary goal of biocompatible scaffolds use is to furnish appropriate support for maintain, improve or restore function of damaged cells, tissue and organs. For the preparation of scaffolds regardless of the tissue type, a great number of natural and synthetic materials were tested and used due to their low toxicity, bio-resorbability and low costs. To provide a satisfying cellular proliferation, optimal diffusion of growing factors, nutrients, gases and an efficient disposal of wasted products. Scaffolds should be designed by means of an interconnected porous structure by optimizing mechanical function and mass-transport requirements. In details, micropores provide the optimal background for cells proliferation and by promoting the physiological interactions between the cells and the extracellular matrix they result in essential tools for successful tissue regeneration. Microporous structures in 3D biocompatible-engineered devices have been realized by means of printing, stereolithography and thermally induced phase separation. Freeze-lyophilizing method and also salt addition and leaching emerged as useful techniques for biocompatible porous scaffolds fabrication. This work describes the realization of poly (epsilon-caprolactone) porous structures by using salt particles as porogen; the porosity of the material has been created by salt leaching by immersing it in distilled water. The results show that the proposed method is suitable for the manufacture of porous structures and depending on the fabrication process different degrees of porosity can be obtained by varying salt sizes and concentration.

Biography

Tania Limongi is a Research Scientist in the Physical Science and Engineering Department of the King Abdullah University of Science and Technology (KAUST) in Saudi Arabia. She received her Master Degree in 1999 in Biological Sciences at the University of L'Aquila and her PhD in Microsystem Engineering at the University of Rome Tor Vergata in 2004. She published more than 40 papers in reputed journals. Her work is mainly addressed on the development of new tissue engineering approaches and on the optimization of single molecule localization protocols and techniques.

tania.limongi@kaust.edu.sa

Notes: