S2-P.1

Hydrogels Based on Collagen and Dextran for Bioartificial Tissues

M. Butnaru, A.M. Lucaci, B.P. Cosman, and L. Verestiuc
Faculty of Medical Bioengineering, University of Medicine and Pharmacy, Iasi, Romania

Hydrogels are crosslinked polymeric networks with a large number of hydrophilic domains. They can expand in numerous solvents and aqueous environments without dissolving owing to the chemical or physical bonds formed between polymer chains. During the past decades, hydrogels have been designed using synthetic or natural polymers like proteins or polysaccharides for biomedical applications such as tissue engineering. Due to its biocompatibility and its structure, most commonly used in tissue engineering is collagen, the most abundant structural protein of the extracellular matrix, which is predominantly found in fibrous connective tissues. In the present study to obtain hydrogels alongside collagen was used also dextran, a polysaccharide derived from glucose condensation. The crosslinking was made under the influence of riboflavin, which is a water-soluble vitamin that plays an important role in the production of energy in the body. In addition, the hydrogels have been exposed to physical treatments like UV radiation and lyophilization. The hydrogels were characterized using FT-IR spectroscopy and to highlight the hydrogels porous was used microscopy in phase contrast and fluorescence microscopy. The citocompatibility tests (MTT) indicated normal values for the cells viability in the presence of hydrogels. For detection of living cells the hydrogels a treatment with calcein AM solution was used and for detection of living cell nuclei was used the DAPI solutions.