Poster (Painel)

151-2 **STUDY OF DIFFERENT FREEZE-DRYING PROCESSES OF BOVINE PERICARDIUM TO THE DEVELOPMENT OF NEW BIOMATERIALS**

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Resumo

Bovine pericardium (BP) tissue is widely used in the manufacture of bioprosthesis. The effects of freeze-drying on the BP tissue has been studied by some researchers to decrease their cytotoxicity due to the preservation in formaldehyde solution and to increase the lifetime of the product in storage. It was shown that after freeze-drying the tissue shows less cytotoxic, probably due to the removal of free aldehyde residues. Moreover, lyophilization proved to be useful to prevent the calcification in vitro of the tissue. In this work we decided to study the effects of lyophilization on BP after freeze-drying process performed by two different freeze-dryers. One of them, which is possible to control all stages during lyophilization, since freezing up to secondary drying, and another without control of the parameters. After lyophilization analysis were performed by scanning electron microscopy (SEM), Raman spectroscopy, tensile tests, water uptake tests and transmission electron microscopy (TEM). The results showed that the freeze-drying of BP should be performed carefully, with the control of all parameters such as temperature of the plate, the product temperature, condenser temperature, primary drying and secondary drying and chamber pressure. The control of these parameters throughout the lyophilization process will ensure the integrity of collagen fibers in BP tissue. Otherwise, the collagen fibers will be broken during the lyophilization process, leading to a considerable loss of mechanical properties.

Palavras-chave: Bovine pericardium, Freeze-drying, Collagen fibers