Providing natural three-dimensional scaffold for Tissue Engineering Studies

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In recent years, matrix biology has an important role in biological and medical research. A clear understanding of the extracellular matrix in tissue engineering research is one of the major goals in these fields. Researchers looking for new strategies to overcome problems of organ transplant or artificial organ. Scaffolds are one of the necessities in tissue engineering as mammalian cells need adhesion. If these cells cannot adhere through the matrix, it will damage. Recently, numerous scaffolds have been investigated that consist of synthetic material or materials derived from natural tissue such as collagen, hyaluronic acid.
addition, scaffold can prepare from natural tissue that become deccellularized in order to remove cells & antigenic molecules. Decellulazed tissue similar to nature ones, can provided an inductive microenvironment for seeded cells on it. There are different methods to remove cells such as chemical, physical and enzymatic. In this study, we used epiphysal bovine bone, age around 4 month & was divided into small cylindrical pieces 1 cm in length & 2 mm in diameter by pancher instrument. Samples treated with boiling water in order to remove fat cells. Then samples was exposed to wet snap freezing -thaw in liquid nitrogen at a -196 °c so as osteocytes was removed. The next step for washing the remaining cells, different concentration of SDS was used with slow agitation. Finally, the samples immersed in PBS solution for washing SDS & stored at 20°c. Samples was washed in Büchner funnel with alcohol, distilled water & sterile normal saline, respectively in order to remove SDS & toxicity from scaffolds. Our scaffolds was studied by macroscopic & microscopic methods. Thus, we prepared section of our scaffolds by Histological techniques & 3D -image by stereomicroscope. Previous study was shown that the standard feature of scaffold that including, porosity, lacking cells to achieve remove antigengenic & toxicity properties. It seems that this scaffold can be used in tissue engineering & in the other hand, having the characteristics of natural three-dimensional seems to make suitable this scaffolds for tissue engineering research. In continuing this research, culture of different cells on a scaffold will implement.

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