

Design and Fabrication of a Scaffold with Appropriate Features for Cartilage Tissue Engineering

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Abstract : Poor ability of cartilage tissue when experiencing a damage leads scientists to use tissue engineering as a reliable and effective method for regenerating or replacing damaged tissues. An artificial tissue should have some features such as biocompatibility, biodegradation and, enough mechanical properties like the original tissue. In this work, a composite hydrogel is prepared by using natural and synthetic materials that has high porosity. Mechanical properties of different combinations of polymers such as modulus of elasticity were tested, and a hydrogel with good mechanical properties was selected. Bone marrow derived mesenchymal stem cells were also seeded into the pores of the sponge, and the results showed the adhesion and proliferation of cells within the hydrogel after one month. In comparison with previous works, this study offers a new and efficient procedure for the fabrication of cartilage like tissue and further cartilage repair.

Keywords : cartilage tissue engineering, hydrogel, mechanical strength, mesenchymal stem cell

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