Methods and Structures for Microengineering Neocartilage Scaffolds

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Technology description

Summary

Therapy for joint damage due to trauma, congenital abnormality, or osteoarthritis has in the past only been limited to the replacement of the joint with a prosthesis. Recently, autologous transplantation of chondrocytes has begun to be performed, however, there are several hurdles that have needed to be overcome, including problems with cell loss and heterogeneous development of tissue density.
The NIH announces a new method of growing chondrocytes on a two-dimensional surface patterned biocompatible scaffold. These scaffolds consist of creating uniform contoured surfaces using photolithographic methods and then covering the surface with a polysaccharide gel. The gel is then allowed to cure and then is removed from the template. Chondrocytes that have been isolated from explants are then applied to the surface and attach to the gel. Once attached, the cells create an extracellular matrix within the gel and layers of neocartilage are created within the square depressions. Functional tissue is thereby produced which can be used as grafts and/or implants in humans.

Institution

NIH - National Institutes of Health

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com