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# Ex Vivo Expansion and 3-D Culture of Human Chondrocytes

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Generally, because of it has limited self-renewal capacity, cartil-age defects does not heal spontaneously. Tissue transplantation is one of the methods for treatment of this type of disease. Tissue transplant con-sists of biomaterials such as biodegradable polymer scaffold and cells. However, to make a proper size of transplant, a large number of cells must be seeded in a scaffold.

In this study, we isolated chondrocytes from human fetal cartilage by culture of minced tissue without enzymatic digestion. After 34 passages (over 6-month period), all cells uniformly exhibited fibroblast-like morphology. During the period, number of cells increased about 2.5~3 folds per each subculture.

Results of immunohistochemical studies of the cells at 13$^{th}$ passage showed that cells were intensely stained with the antibodies against collagen type I, II, III, XII, fibronectin, won Willebrand factor, CD44, CD54, TRA-1-60, vimentin and HLA class I, II proteins, but were negative against collagen type IV, CD106 and CD54. When cells were seeded into PLGA scaffold and cultured for 2 months, chondrocytes were looked healthy and tightly packed in the pore of the scaffold. And pellet culture of chondrocytes for 3 months, the histological morphology of cultured pellets was similar to the pattern of *in vivo*.

From these observations, human chondrocytes can be expanded *in vitro*, and a scaffold with chondrocytes or chondrocyte pellet culture methods might be an effective transplant for the treatment of knee injury patients.