



**Multi-Stage Collagen Based Implant for Use in the Repair of Cartilage Defects**

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Background:

It has been well documented that injured articular cartilage has only a limited ability for self-repair. Articular cartilage injuries result in numerous clinical symptoms, such as pain and decreased functional levels. Chondrocytes are unable to adequately proliferate, migrate, and synthesize high-quality repair tissue in response to blunt, superficial, or deep penetrating trauma. The current treatments for articular injury often result in a fibrous repair that deteriorates with time. Long-term morbidity such as degeneration to arthritic conditions will often result in patients with chronic cartilage problems.

Description of Project:

The invention is a template to aid in the regeneration of articular cartilage. The template is formed by combining a porous collagen sponge ("collagen matrix") with a dense collagen membrane. The dense collagen membrane is placed on the surface of the cartilage defect to prevent cell migration from the subchondral plate and vasculature. The collagen membrane will allow movement and exchange of fluids, nutrients, cytokines and other factors necessary for cartilage regeneration. The collagen matrix has been developed to allow attachment and growth of cells, specifically chondrocytes which are normally found in articular cartilage. The collagen matrix can be combined with chondrocytes in vitro, and therefore serves to transport cultured cells to the defect site and to retain the cells in position following implantation. When implanted in rabbit femoral trochleas, it allowed sustained hyaline-like repair of articular defects during an entire six-month period of observation.

Applications:

Surgical procedures for the repair of cartilage damage and defects.

Patent Status:

US patent number 6,080,194 has issued and a PCT has been filed.

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