Modulation of Cartilage’s Response to Injury: Can Chondrocyte Apoptosis be Reversed?

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Osteoarthritis is characterized by a chronic, progressive and irreversible degradation of the articular cartilage associated with joint inflammation and a reparative bone response. More than 100 million people are affected by this condition worldwide with significant health and welfare costs. Our available treatment options in osteoarthritis are extremely limited.

Chondral or osteochondral grafts have shown some promising results but joint replacement surgery is by far the most common therapeutic approach. The difficulty lies on the limited regeneration capacity of the articular cartilage, poor blood supply and the paucity of resident progenitor stem cells. In addition, our poor understanding of the molecular signaling pathways involved in the senescence and apoptosis of chondrocytes is a major factor restricting further progress in the area.

The lecture will cover on the molecules and approaches that can be implemented to delay or even rescue chondrocyte apoptosis. Ways of modulating the physiologic response to trauma preventing chondrocyte death will be discussed. The use of several cytokines, growth factors and advances made in altering several of the degenerative genetic pathways involved in chondrocyte apoptosis and degradation will be presented. The suggested approaches can help clinicians to improve cartilage tissue regeneration.