

32c Transcription of Type II Collagen in Engineered Cartilage

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Cartilage is a connective tissue found throughout the body in the form of hyaline cartilage, elastic cartilage, and fibrocartilage. A thin, dense layer of hyaline cartilage is found at the epiphysis of the bones in movable joints, such as the knee, and is called articular cartilage. Along with synovial fluid in the joint, the articular cartilage provides near frictionless motion between the bones of a joint. Cartilage also helps the joint withstand a highly loaded environment by displacing the force over a larger area. This helps to decrease the stresses on the bone joint surfaces. Cartilage is composed of cells called chondrocytes that secrete and maintain the extracellular matrix, including type II collagen, which provides the strength to withstand stress. Type II collagen production can be a measure of chondrocyte function. Cartilage has no direct blood supply, so it is said to be avascular. Because of its avascular nature, cartilage has a limited ability to regenerate following trauma or disease because important healing factors found in the blood cannot migrate to the site. There are only a few surgical options to fix injured cartilage, so tissue engineering is being explored as an alternative to modern surgical techniques. This experiment focuses on harvesting chondrocytes from bovine specimens, culturing chondrocytes on different biomaterials, and determining the effect of cell concentration on type II collagen production through Reverse Transcriptase- Polymerase Chain Reaction.