

## Chapter 3

### MICRORNA IN OSTEOARTHRITIS

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#### 1. ARTICULAR CARTILAGE

Articular cartilage is a highly specialized alymphatic and avascularized connective tissue of the diarthrodial joints. It mainly functions as a smooth and lubricating surface for articulation and facilitates load transmission with minimum friction. As it lacks blood vessels and lymphatics it has a very limited capacity for intrinsic healing and repair. Regarding this fact, protection and health of articular cartilage is very important, an injury of this tissue is considered as a cause of significant musculoskeletal morbidity. The unique and complex structure of articular cartilage makes it difficult for the patients, doctors, and physiotherapists to plan a treatment for joint problems.

##### 1.1. Structure of articular cartilage

The articular cartilage is hyaline cartilage and have a thickness of 2mm- 4 mm. Unlike most tissues, the articular cartilage does not have blood vessels, nerves, or lymphatics. It consists of highly specialized cells called chondrocytes and a dense extracellular matrix (ECM) formed by these cells. ECM, mainly consists of proteoglycans in combination with glycoproteins and non-collagenous proteins (Buckwalter, Hunzinker & Rosenberg, 1998, Buckwalter & Mankin, 1997). These components provide water retention abilities to ECM, which is critical for articular cartilage to maintain unique mechanical properties. In combination with collagen fibers and ECM, chondrocytes are distributed in 4 different articular cartilage regions; superficial zone, middle zone, deep zone and calcified area.

The tangential zone of articular cartilage protects the deeper layers from stress and possess approximately 10 to 20% of the thickness of the articular cartilage. The collagen fibers of this zone (mainly type II and IX collagen) are tightly packed and aligned parallel to the joint surface. The chondrocytes

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