

軟骨的細胞生物學及生化學

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Joints are highly specialized organs, which tolerate repetitive and frictionless movements. These assets are provided by the articular cartilage and extracellular matrix. Under normal physiological conditions, joints are capable of withstanding high mechanical loading. Joints are complicated composites with different types of connective tissue, which extend over articular cartilage. These are composed of ligaments, synovium, subchondral bone, and joint capsules, providing different and reciprocal functioning of the joint. Normal articular cartilage is composed of a substantial hydrated extracellular matrix and chondrocytes. The extracellular matrix is composed of a collagen network (mostly type II with lesser amounts of type IX, XI and other collagens) and provides tensile strength to maintain the retention of proteoglycans. The Proteoglycans (mostly aggrecan) are aggregated with hyaluronic acid (HA). Other large components, including non-collagenous proteins, contribute to the unique properties of the matrix. Non-collagenous proteins include cartilage oligomeric matrix protein, biglycan, tenascins, matrilins, and fibronectins, etc. Chondrocytes comprise 2-5% of the total volume and are fairly inactive metabolically, owing to the absence of a vascular supply. The chondrocyte, architect of cartilage, and related molecular biology will be discussed in this lecture.

Besides, Biomarkers, which reflect dynamic and quantitative changes in joint tissue remodeling have been proposed as an alternative method to detect OA development and progression. To describe the potential uses of biomarkers, the BIPED scheme was proposed to classify OA markers. This classification sub-classified current potential OA biomarkers into five categories according to whether these markers can provide information on the burden of disease, being investigative, prognosis prediction, reflection of effective treatment, and disease diagnosis. Classification of BIPED will be also discussed in the lecture.