

CARTILAGE

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DEFINITION

CARTILAGE IS A SPECIALIZED TYPE OF DENSE CONNECTIVE TISSUE DESIGNED TO GIVE SUPPORT, BEAR WEIGHT AND WITHSTAND TENSION, TORSION AND BENDING.

GENERAL FEATURES

- **CARTILAGE SUPPORT REGIONS OF THE BODY THAT REQUIRE FLEXIBILITY**
- **AVASCULAR-NOURISHED BY ?**
- **NON NERVOUS STRUCTURE**
- **POOR REGENERATION CAPACITY**
- **GROWTH TAKES PLACE BY 2 METHODS-
APPOSITIONAL GROWTH AND INTERSTITIAL GROWTH**
- **USUALLY SURROUNDED BY PERICHONDRIUM (EXCEPT
ARTICULAR CARTILAGE AND FIBRO CARTILAGE)**

PERICHONDRIUM

- **CARTILAGE IS COVERED EXTERNALLY BY A DENSE CONNECTIVE TISSUE SHEATH KNOWN AS PERICHONDRIUM EXCEPT ARTICULAR CARTILAGE AND FIBRO CARTILAGE.**
- **HAS TWO LAYERS- OUTER FIBROUS LAYER (VASCULAR) AND INNER CHONDROGENIC LAYER (CELLULAR)**
- **HAS CELLS WHICH CAN REGROW CARTILAGE TO SOME EXTENT IF THE CARTILAGE IS DAMAGED.**

COMPONENTS

- **CELLS- MESENCHYMAL CELLS, CHONDROBLASTS AND CHONDROCYTES**
- **FIBRES-COLLAGEN AND ELASTIC**
 - **GROUND SUBSTANCE- MUCOPOLYSACCHARIDES (CHONDROITIN SULPHATE)**

CELLS OF THE CARTILAGE

- THEY ARE DERIVED FROM UNDIFFERENTIATED MESENCHYMAL CELLS
- YOUNG CELLS ARE SMALL WITH BRANCHED CYTOPLASMIC PROCESSES KNOWN AS CHONDROBLASTS, THEY MULTIPLY TO CHONDROCYTES
- OLDER AND MATURE CELLS ARE KNOWN AS CHONDROCYTES
- CHONDROCYTES ARE BIGGER IN SIZE AND ARE FOUND IN SPACES CALLED AS LACUNAE
- THEY ARE FOUND GROUPS OF 2-4 CELLS TOGETHER KNOWN AS CELL NEST
- THEY ARE RESPONSIBLE FOR PRODUCTION OF FIBRES AND GROUND SUBSTANCE OF THE CARTILAGE
- OLD MATURE CELLS ARE INCAPABLE OF MULTIPLICATION

CLASSIFICATION/ TYPES

- HYALINE CARTILAGE
- ELASTIC CARTILAGE
- FIBRO CARTILAGE

AREAS FOUND

CARTILAGE	OCCURENCE
HYALINE CARTILAGE	EPIPHYSIAL GROWTH PLATE, RIBS, RESPIRATORY TRACT, ARTICULAR CARTILAGE
ELASTIC CARTILAGE	PINNA , EPIGLOTTIS, EXTERNAL AUDITORY MEATUS, ARYTENOID CORNICULATE, CUNEIFORM CARTILAGE.
FIBRO CARTILAGE	INTERVERTEBRAL DISCS.

HISTOLOGICAL FEATURES

OR

MICROSCOPIC

FEATURES

OR

MICROSCOPIC

ANATOMY

HYALINE CARTILAGE

- **CHARACTERIZED BY THE PRESENCE OF HIGHLY BASOPHILIC HOMOGENEOUS MATRIX**
- **APPEAR HOMOGENEOUS AS THE COLLAGEN FIBRES PRESENT IN THEM HAVE THE SAME REFRACTIVE INDEX AS GROUND SUBSTANCE**
- **PERICHONDRIUM PRESENT**
- **CELLS ENCAPSULATED IN GROUPS OF 2-4 CELLS**
- **MATRIX AROUND THE CELLS IS BRIGHTER AND DEEP IN COLOUR THAN OTHER AREAS , THIS MATRIX IS KNOWN TERRITORIAL MATRIX.**
- **TWO GROUPS OF CELLS ARE SEPARATED BY A LIGHTLY COLOURED MATRIX KNOWN INTER-TERRITORIAL MATRIX**

ELASTIC CARTILAGE

- **PERICHONDRIUM PRESENT**
- **CHARACTERIZED BY THE PRESENCE OF ELASTIC FIBRES IN ABUNDANCE WHICH BRANCH AND ANASTOMOSE**
- **CHONDROCYTES ARE LARGER THAN THOSE OF HYALINE CARTILAGE AND PRESENT IN SINGLY.**

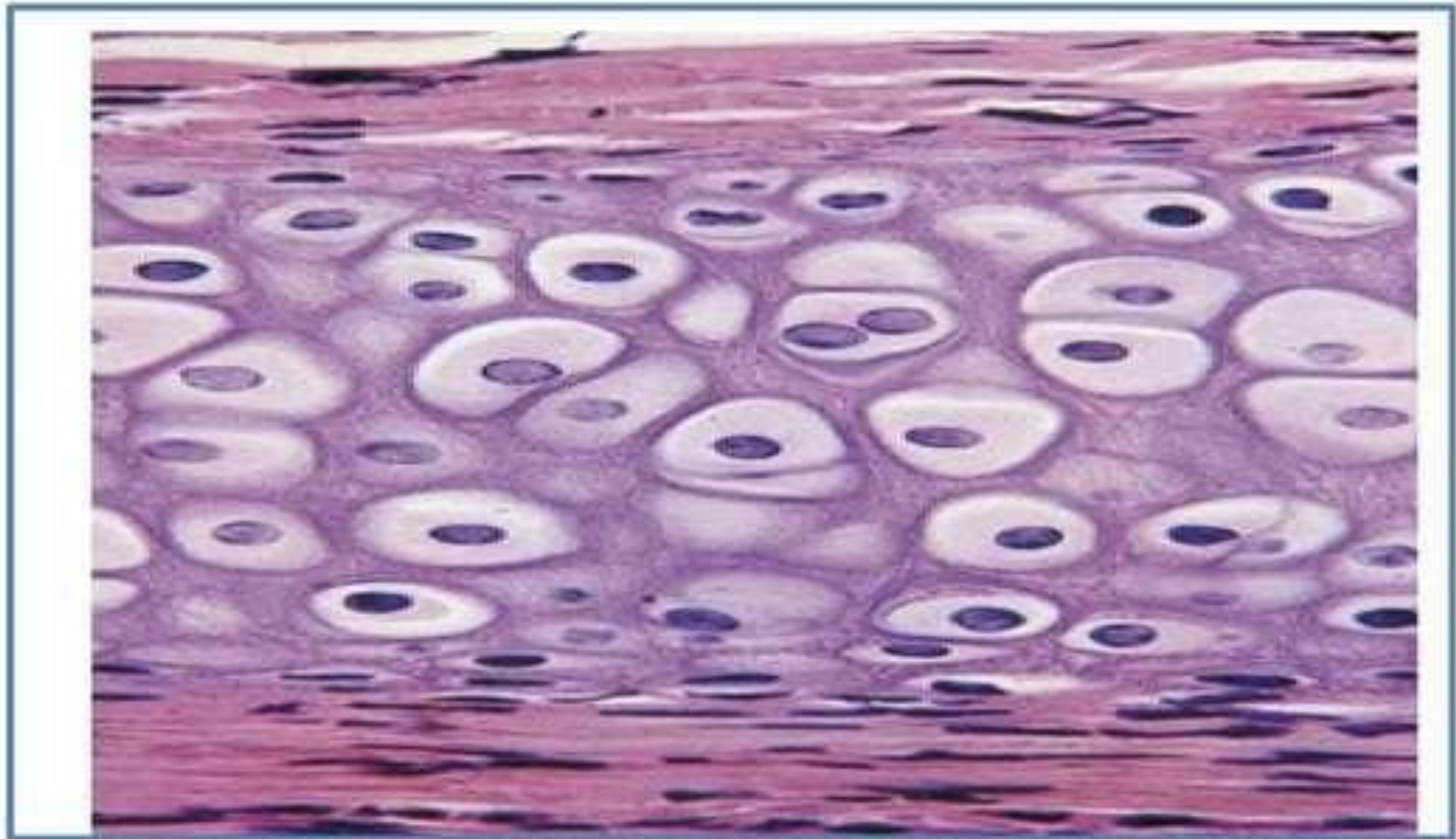
FIBRO CARTILAGE

- **PERICHONDRIUM IS CHARACTERISTICALLY ABSENT**
- **HAS THIC BUNDLES OF COLLAGEN FIBRES**
- **CHONDROCYTES ARE SEEN BETWEEN THESE FIBRES IN SINGLY IN NARROW ROWS**

FEATURES OF IDENTIFICATION

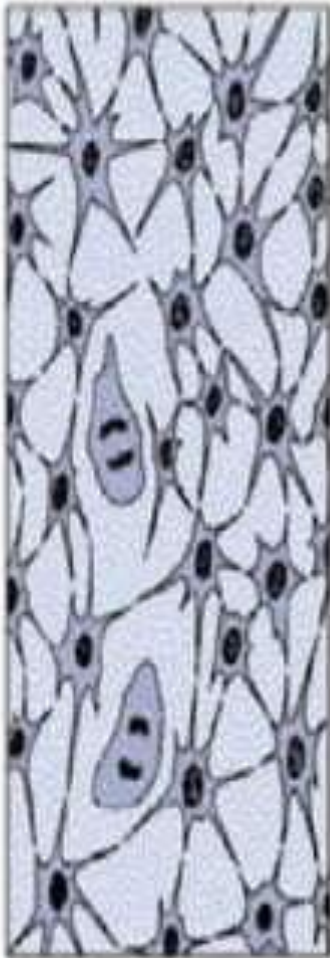
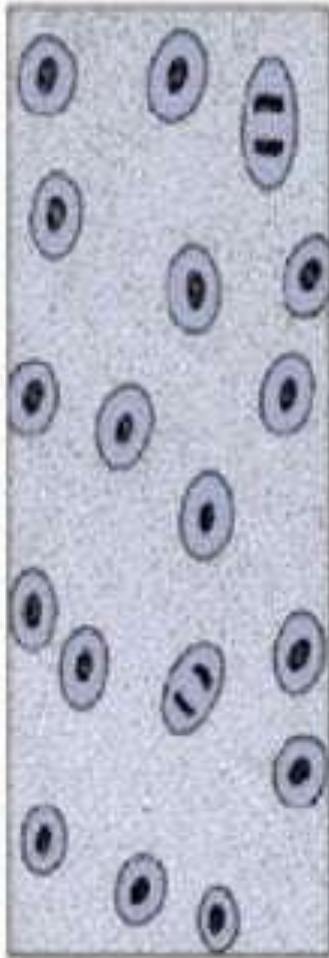
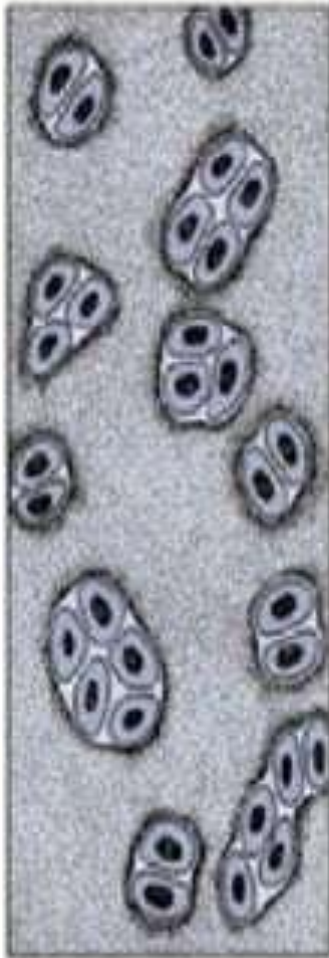
HYALINE CARTILAGE	ELASTIC CARTILAGE	FIBRO CARTILAGE
1. PERICHONDRIUM PRESENT	1. PERICHONDRIUM PRESENT	1. PERICHONDRIUM ABSENT
2. GROUND SUBSTANCE HIGHLY BASOPHILIC AND HOMOGENEOUS	2. NUMEROUS ELASTIC FIBRES	2. BUNDLES OF COLLAGEN FIBRES
3. CHONDROCYTES IN LACUNAE AND IN GROUPS	3. SINGLE CHONDROCYTES IN LACUNA	FEW CHONDROCYTES SEEN

HYALINE CARTILAGE

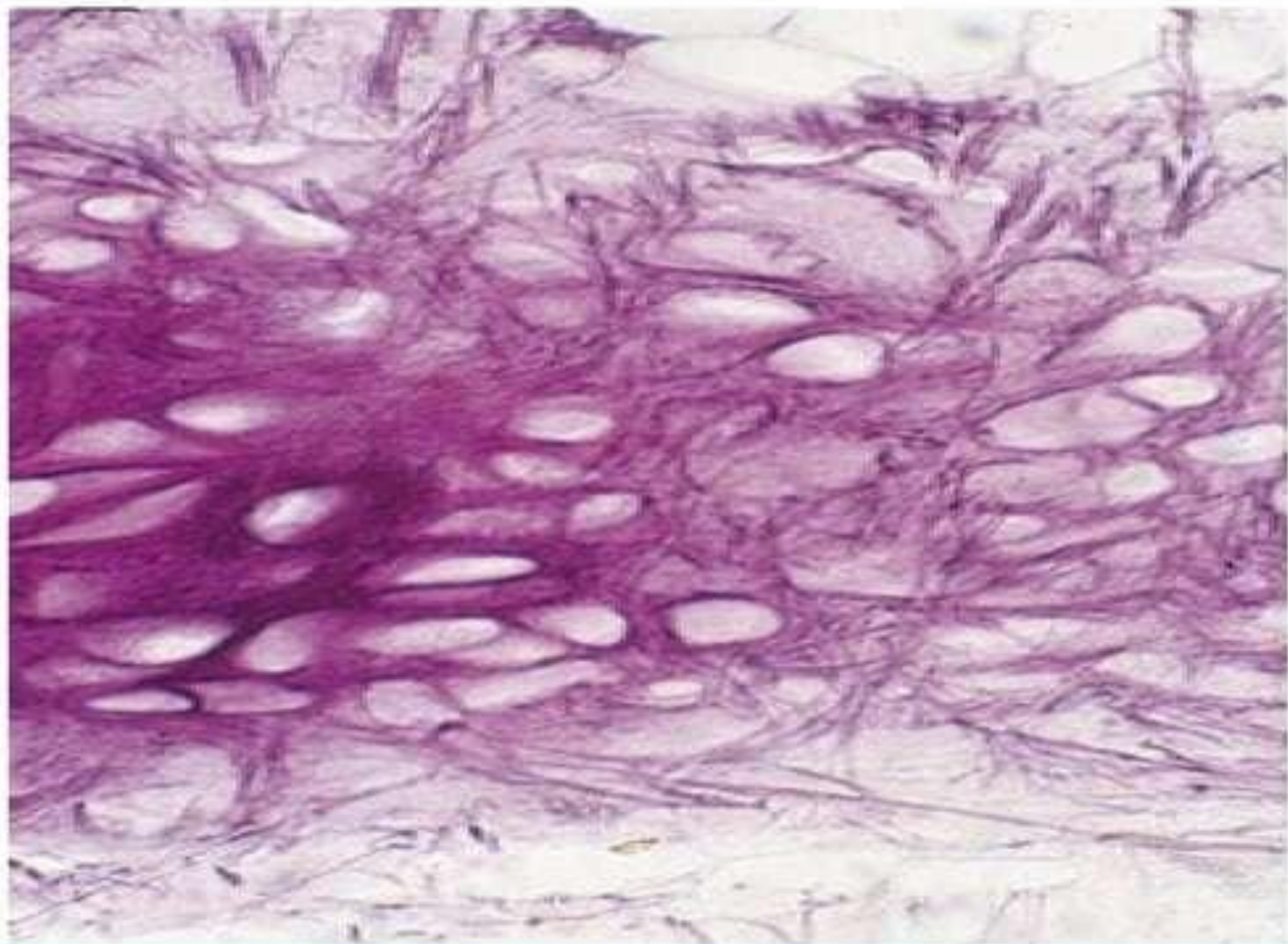


HYALINE CARTILAGE

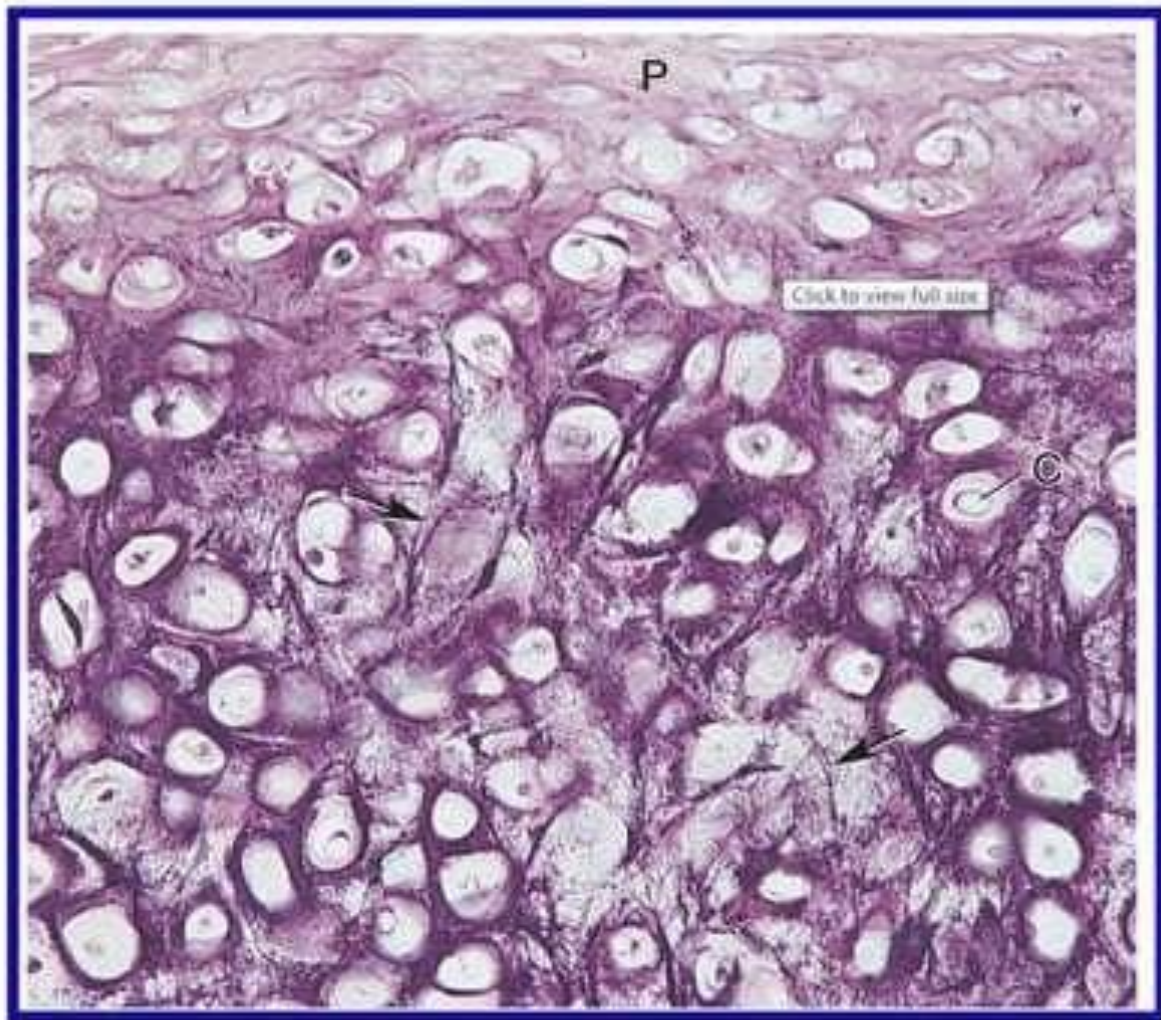


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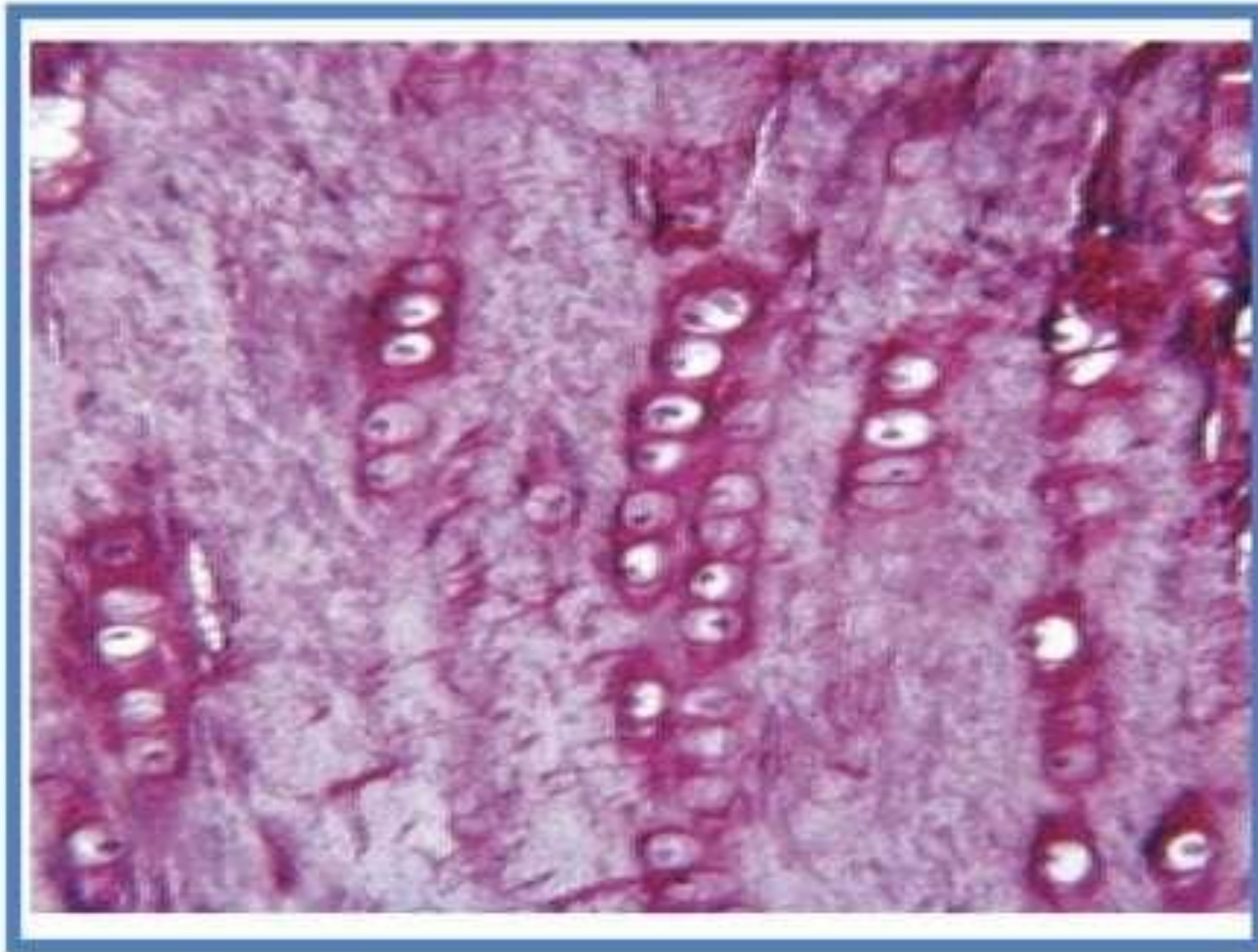
ELASTIC CARTILAGE



ELASTIC CARTILAGE

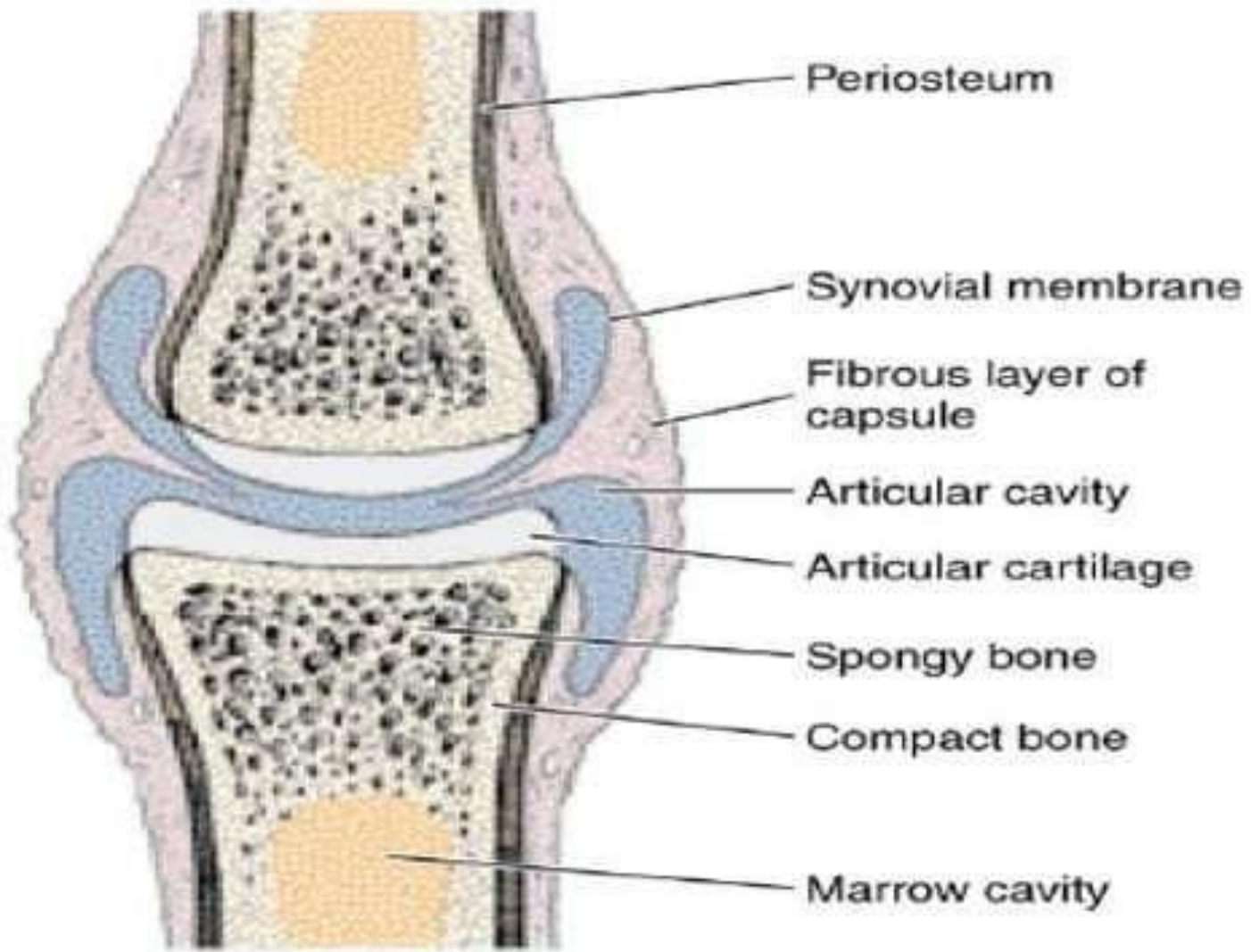


FIBRO CARTILAGE



APPLIED HISTOLOGY

- OSTEOARTHRITIS
- SLIP DISC
- HYALINE CARTILAGE HAVE A TENDENCY TO OSSIFY WITH AGE



Periosteum

Synovial membrane

Fibrous layer of capsule

Articular cavity

Articular cartilage

Spongy bone

Compact bone

Marrow cavity

QUESTIONS

- **WHAT ARE THE TYPES OF CARTILAGE. GIVE EXAMPLES**
- **WHAT IS PERICHONDRIUM**
- **WHAT ARE CELL NEST. HOW ARE THEY FORMED**
- **WHAT THE COMPONENTS OF CARTILAGE**
- **GIVE THE IDENTIFYING FEATURES OF EACH VARIETY OF CARTILAGE**
- **WHAT IS CALCIFICATION OF CARTILAGE**