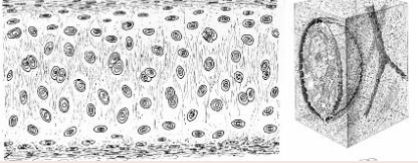
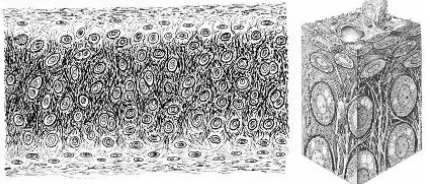


DISTINGUISHING BETWEEN THE 3 TYPES OF CARTILAGE

	Hyaline Cartilage (most common)	Elastic Cartilage	Fibrocartilage
What does it look like?	<i>Hyalos</i> = "glassy", semi-translucent appearance in gross specimens	Similar to hyaline cartilage but contains many yellow elastic fibers lying in a solid matrix Special elastin staining (Verhoeff staining) can make elastic fiber more visible & make it appear black	"Transitional" form between cartilage and true fibrous CT, has a dense arrangement of cartilage fibers that are arranged in an orderly manner. Numerous chondrocytes are located within their lacunae & are between the fibers.
Where is it found?	Located in the wall of tracheal & bronchial rings, nasal septum, larynx, costal cartilage, epiphyseal plates, & articulating surface of synovial joints	Where resilient & springiness are needed Ex: Epiglottis, pinna (ear), larynx	Limited distribution Ex: Intervertebral discs, & pubic symphysis
Describe its matrix/matrix contents	Very fine sized type II <u>collagen</u> fibrils/or fibers but not fiber bundles predominate in matrix Contains GAGs, proteoglycans, glycoproteins & extracellular fluid. Has 2 types of matrix: --territorial matrix (also called capsular matrix) --interterritorial matrix Abundant Matrix	Abundant fine to coarse sized <u>elastic</u> fibers in matrix interposed with fine type II collagen fibrils/fibers that confer flexibility & shape retention	Large number of type I <u>collagen</u> large fiber bundles in matrix Scant amount of matrix
Surrounded by perichondrium?	Yes	Yes	No. No perichondrium Cover
How does it look in H&E stained sections?	In H&E sections, elastic cartilage looks the same as hyaline cartilage	In H&E sections, elastic cartilage looks the same as hyaline cartilage	
What can be seen under light microscope?	fine collagen fibrils are too small to be seen under light microscope, so the matrix appears to be an amorphous, homogeneous "glassy" semi-transparent mass.	Under light microscope the elastic fibers can be only seen at higher magnification.	

COMPARISON CHART OF HYALINE CARTILAGE AND ELASTIC CARTILAGE

	Hyaline	Elastic
Matrix?	More Matrix	Less Matrix
Fibers?	Fewer Fibers	More fibers
Fiber material?	Collagen	Elastic
Covered by perichondrium?	Yes	Yes
Isogenous Groups?	Defined Isogenous Groups	Isogenous groups are more crowded
Photos		

COMPARISON CHART OF THE TWO MATRIX TYPES WITHIN THE HYALINE MATRIX

	Territorial Matrix	Interterritorial matrix
Amount of collagen?	Poor in collagen	Much more collagen
Composition of hyaline cartilage matrix?	Makes up the surrounding area immediately near the lacunae	Makes up the bulk of the rest of the matrix that is unoccupied by the territorial matrix
Amount of proteoglycans?	Rich in GAGs & proteoglycan (acidic), so it is Basophilic	Poor in proteoglycan (basic)
Staining color?	Stains darker under HE staining	Stains pale under HE staining

Appositional Growth Pattern

- Performed by chondroblasts
- occurs at edges of cartilaginous structures like endosteal and periosteal surfaces
- increases width of growing bones
- fibroblasts in perichondrium differentiate into chondroblasts, then become chondrocytes. Matrix is made and laid down, making the cartilage grow outward

Interstitial Growth Pattern

- Performed by chondrocytes
- occurs in hyaline cartilage of epiphyseal plate
- increases length of growing bone
- Existing chondrocytes undergo several mitotic division make more intercellular matrix, leading to cartilage expansion from within.

COMPARISON CHART OF THE TWO TYPES OF CARTILAGE CELLS RECOGNIZED IN CARTILAGE		
	Chondroblasts	Chondrocytes
Where is it found?	Found in growing cartilage, near the perichondrium	Found in a lacuna within the semirigid extracellular matrix
What do they do?	Actively makes the matrix of cartilage	Less active than chondroblasts. Contains the featured organelles (rich in eER & golgi apparatus) of protein-secretion cells, which allows them to be responsible for continuous ongoing maintenance of the surrounding matrix
Maturity Level?	Immature cells	Mature cells
Origin?	A type of mesenchymal progenitor cell	Derived from chondroblast
Type of growth?	Involved in appositional growth of cartilage	Involved in interstitial growth of cartilage