



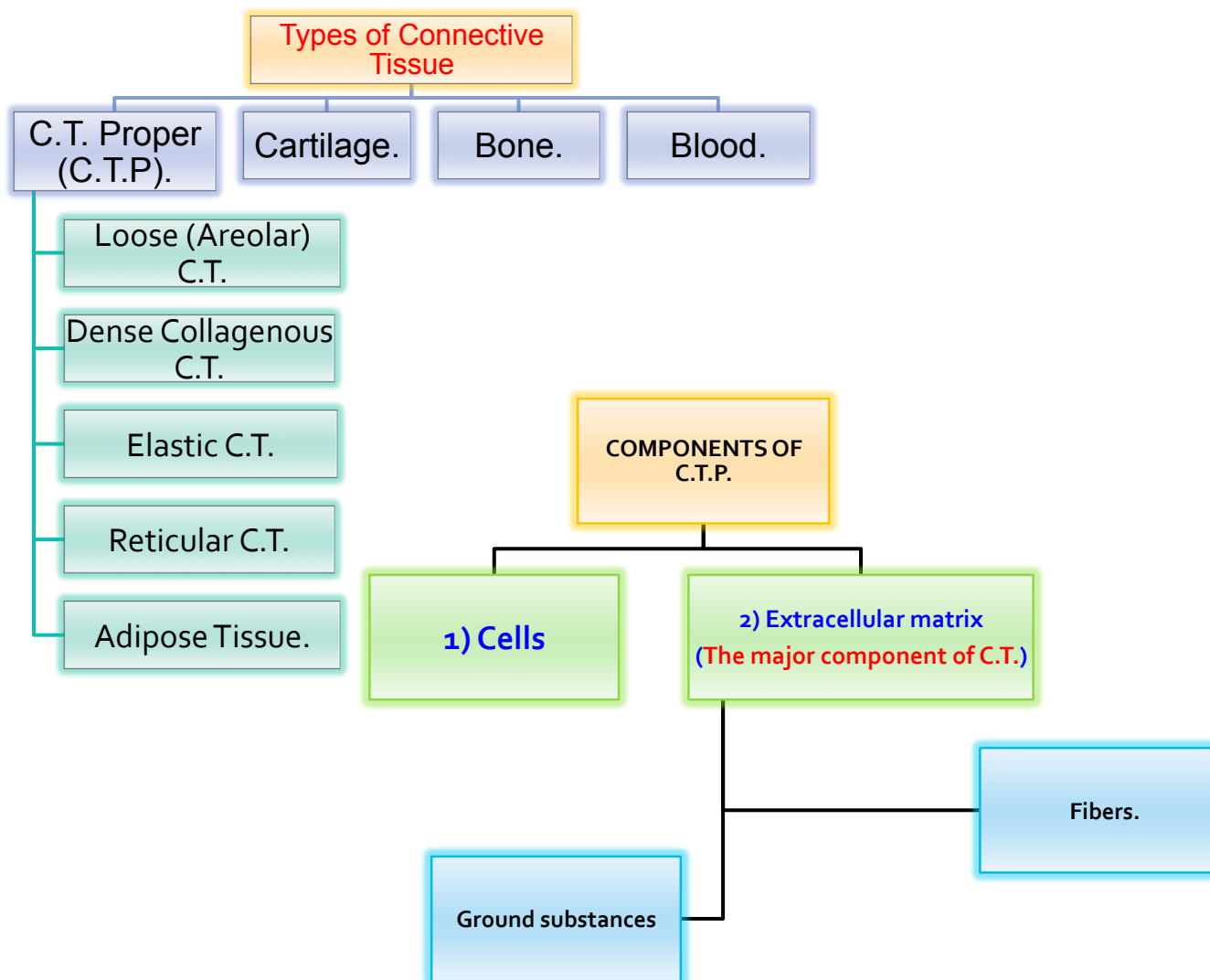
Lecture Objectives:

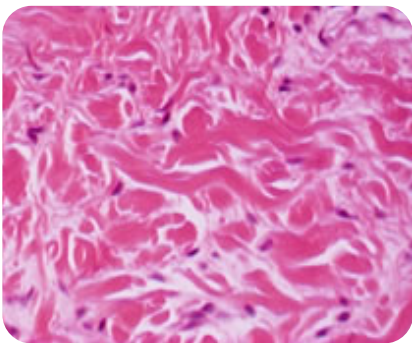
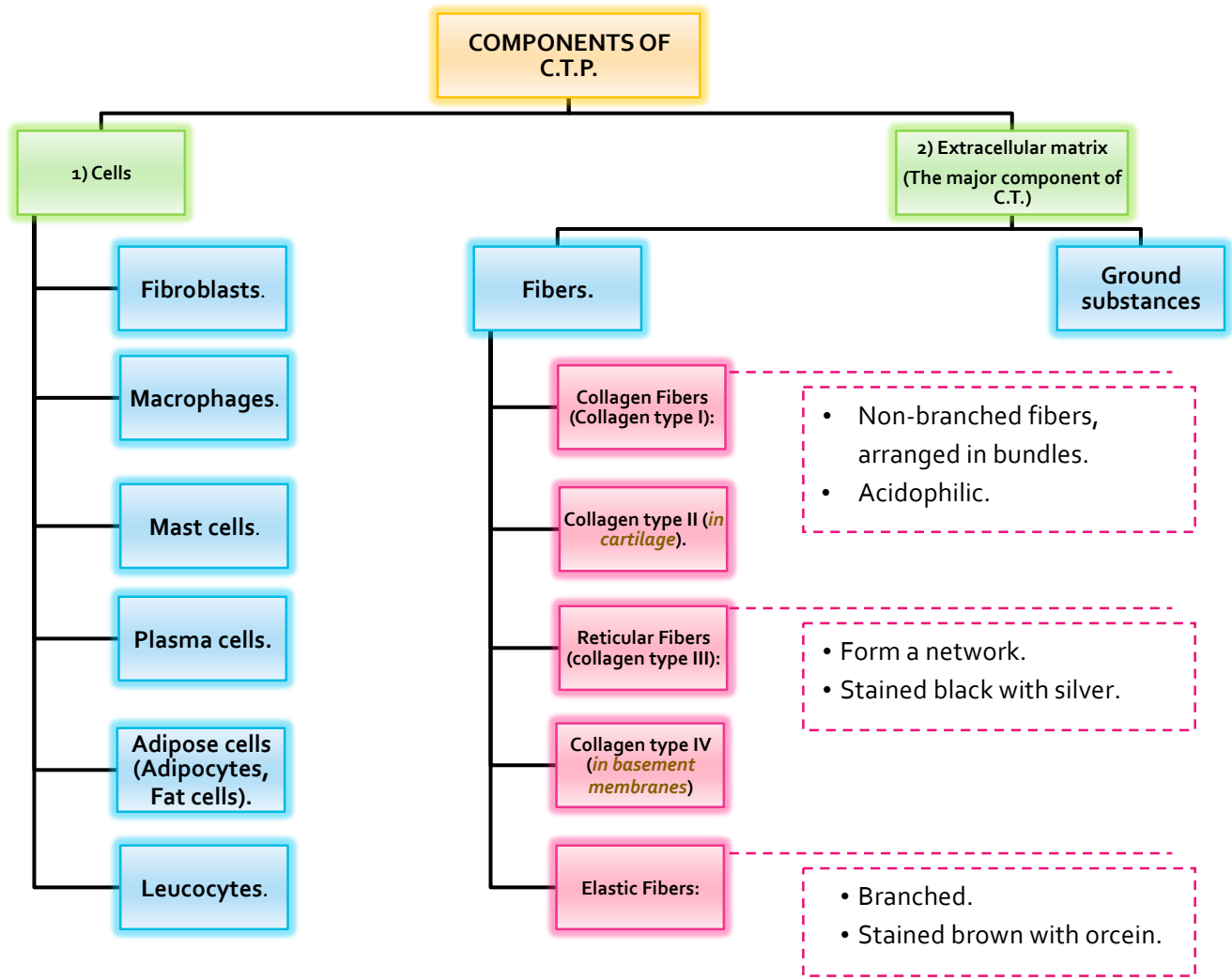
- Enumerate the general characteristics of C.T.
- Classify C.T.
- Classify C.T. proper (C.T.P.)
- Describe the structure (components) and distribution of different types of C.T.P.
- Discuss clinical applications related to C.T.P.

DEFINITION OF C.T:

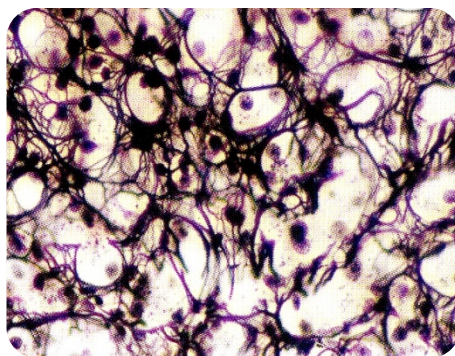
It is a basic type of tissue, of mesodermal origin, which provides structural & metabolic support for tissues & organs.

Comparison: The Characteristics of C.T & Epithelial Tissue		
#	Connective Tissue	Epithelial Tissue
Distance between cells	Are formed of widely separated few cells.	Adjacent cells are tightly joined.
Amount of extracellular matrix	Abundant extracellular matrix.	Little intercellular space.
Presence of vessels	most C.T. are vascular	Avascular; because there is very little space between the cells.
Presence of basement membrane	-----	Rests on a basement membrane.
Regeneration	-----	Regenerates quickly.

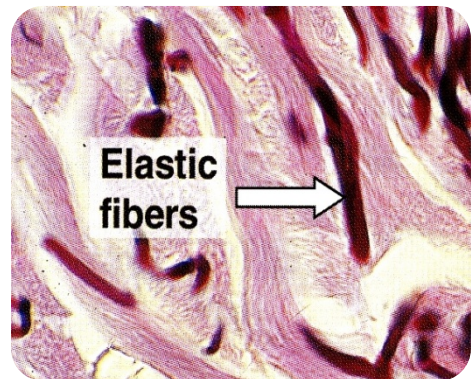




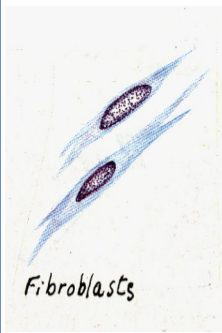
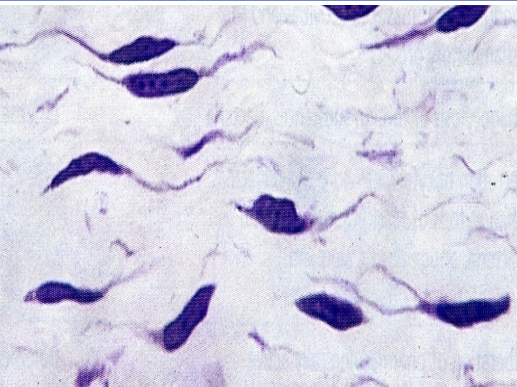
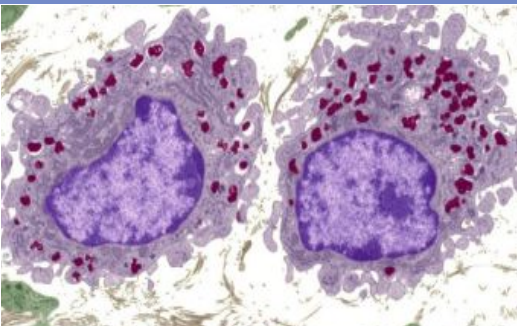


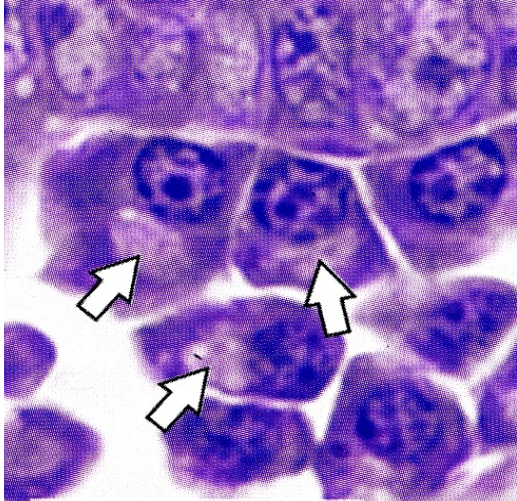
Collagen Fibers
(Collagen type I)

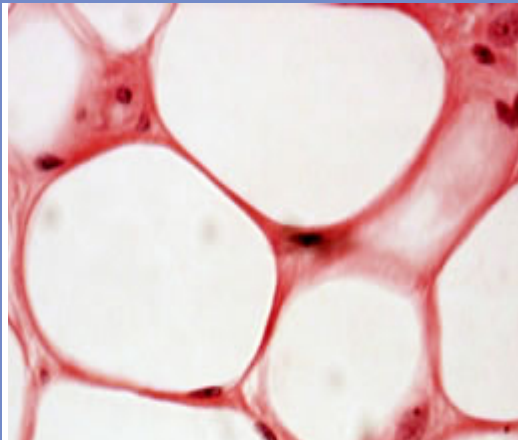


Reticular Fibers
(collagen type III)

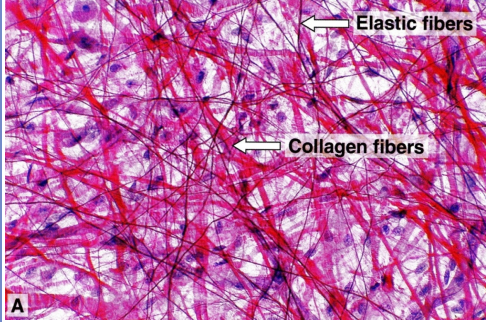
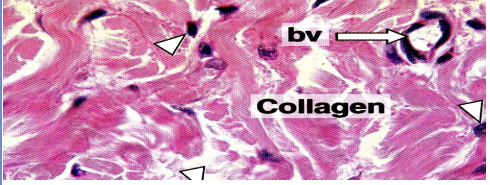
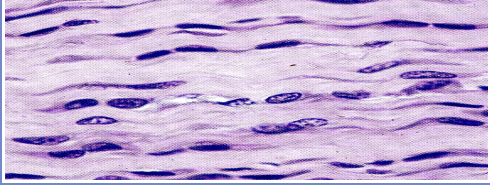
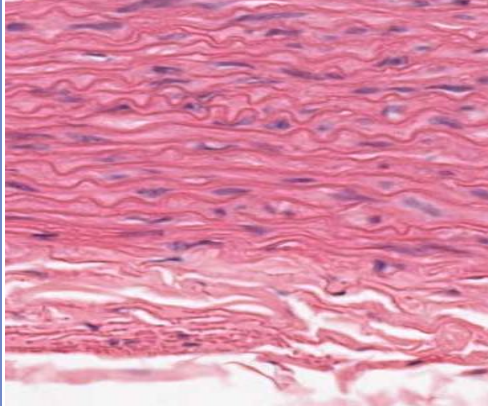
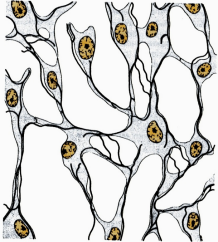
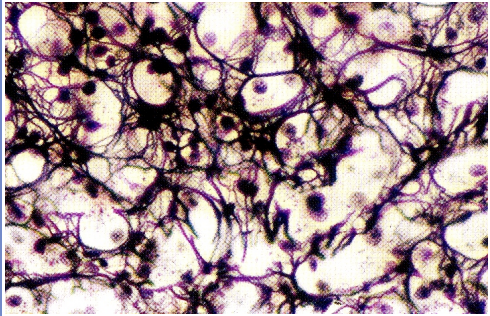


Elastic Fibers

Cells	L\ M	Function	Under LM
<p>(1) Fibroblasts</p>  <p><i>Fibroblasts</i></p>	<ul style="list-style-type: none"> • Flat branched cells (spindle-shaped) with basophilic cytoplasm (thus active). • They can divide. • Old fibroblasts are called fibrocytes (inactive). 	<p>1- Formation of proteins of extracellular matrix.</p> <p>2- Healing of wounds.</p>	
<p>(2) Macrophages</p>	<ul style="list-style-type: none"> • Basophilic cytoplasm, rich in lysosomes. • Irregular outlines. • They can divide. • They originate from monocytes. 	<p>Phagocytosis.</p>	
<p>(3) Mast Cells</p>	<ul style="list-style-type: none"> • Cytoplasm contains numerous cytoplasmic granules. 	<p>Secrete heparin & histamine.</p>	 <p>Blood vessel</p>
<p>(4) Plasma Cells</p> 	<ul style="list-style-type: none"> • Basophilic cytoplasm with a negative Golgi image. • Nucleus: spherical, eccentric with a clock-face appearance of chromatin. • Derived from B-lymphocytes. 	<p>Secretion of antibodies (immunoglobulins).</p>	

(5) Adipose Cells (Adipocytes, Fat Cells)	L/M of Unilocular Adipose Cells: <ul style="list-style-type: none">• Large spherical, with a single large fat droplet.• Thin rim (borderline) of cytoplasm at the periphery.• Nucleus: flattened, peripheral.	<ul style="list-style-type: none">• Storage of fat.	
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- Loose connective tissue → most common.
- Fibroblasts are rich in rough endoplasmic reticulum and ribosomes in order to form the basophilic extracellular matrix.
- Because they are responsible for the formation of antibodies, which are proteins; Plasma cells are rich in rough ER and ribosomes.
- Adipose cells → rich in smooth endoplasmic reticulum → form lipids.
- Adipose cells appear with empty cavities under the microscope because one of the steps of the procedure the tissue undergoes during the preparation of the slide is adding xylene, which yields to the dissolving of the fat.

Types of C.T.P	L\ M	Sites	Under LM
(1) Loose (Areolar) C.T.	Contains all the main components of C.T.P. (no predominant element in loose C.T.)	Subcutaneous tissue.	 <p>Labels: Elastic fibers, Collagen fibers</p>
(2) Dense Collagenous C.T.	Predominance of collagen fibers + Fibroblasts. (collagen bundles separated by fibroblasts). - no nuclei present in collagen fibers, only present in fibroblasts.	1- Dense irregular: e.g. dermis of the skin, capsule.	 <p>Labels: bv, Collagen</p>
		2- Dense regular: e.g. tendons, ligaments.	
(3) Elastic C.T.	Branching elastic fibers (or membranes) + Fibroblasts (or smooth muscle cells).	e.g. Aorta.	
(4) Reticular C.T.	 <p>Reticular fibers + Reticular cells (specialized fibroblasts).</p>	Stroma of organs: e.g. liver, lymph node, spleen.	

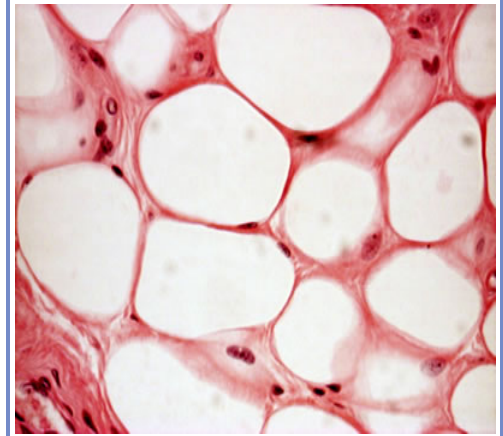
(5) **Unilocular Adipose Tissue** (White Adipose Tissue).

Is formed of lobules of **unilocular adipose cells**.

Function:

Synthesis, storage & release of fat.

- Subcutaneous layers especially in buttocks & hips.
- Abdominal wall.
- Female breast.
- Around the kidney.



Clinical Applications:

Bronchial Asthma

Exposure to allergen will stimulate mast cells in the lungs, which leads to release of histamine and other chemicals that lead to contraction of the smooth muscle fibers in the wall of the bronchioles (bronchospasm) leading to dyspnea (difficulty in breathing).

Obesity

1- Hypertrophic obesity:

It results from the accumulation and storage of fat in the unilocular fat cells (white adipocytes). These cells may increase in size up to four times.

2- Hypercellular obesity:

It results from an increase in number of adipocytes, which may be attributed to increased number of adipocyte precursors in infancy.