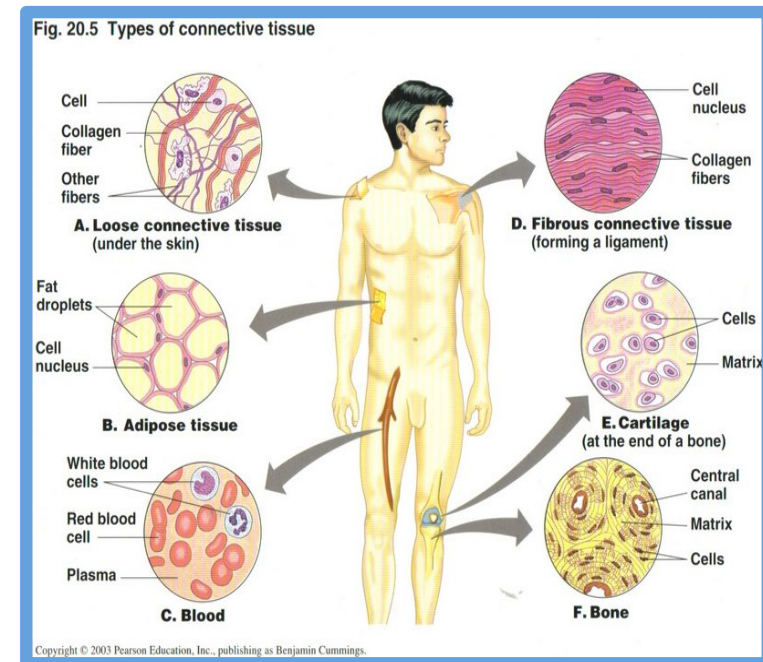


CONNECTIVE TISSUE (C.T.)

OBJECTIVES

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



Color Index:

Red = Important Notes Orange = Further Explanation Purple = Additional Notes

DEFINITION OF C.T., GENERAL CHARACTERISTICS & C.T. TYPES

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

▣ GENERAL CHARACTERISTICS

1. Formed of widely separated. (few cells with abundant extracellular matrix)
2. Most C.T. are **vascular** (have blood vessels going through it) _

▣ TYPES OF C.T.

1. C.T. Proper. (C.T.P)
2. Cartilage.
3. Bone.
4. Blood.

COMPONENTS & TYPES OF C.T.P

▣ TYPES OF C.T. PROPER

- Loose (Areolar) C.T.
- Dense Collagenous C.T.
- Elastic C.T.
- Reticular C.T.
- Adipose Tissue.

▣ COMPONENTS OF C.T.P

- Cells.
- Fibers.
- Ground substance.
- Extracellular matrix. (The major component of C.T.)

❖ Loose C.T.P. is called areolar because before discovering the stains we use now the old stains showed the extracellular matrix as an empty space which made them think that it's air which is not.

CELLS OF C.T.P

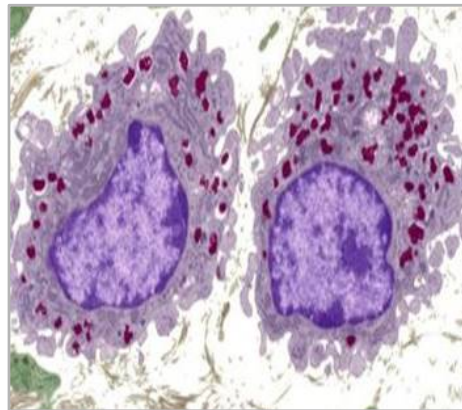
Cells	L/M (under Light Microscope)	Function
Fibroblasts	<ul style="list-style-type: none"> • Flat branched cells (spindle-shaped) • basophilic cytoplasm. • They can divide. • Old fibroblasts are called fibrocytes 	<ul style="list-style-type: none"> • Formation of proteins of extracellular matrix. • Healing of wounds
Macrophages	<ul style="list-style-type: none"> • Basophilic cytoplasm, rich in lysosomes. • Irregular outlines. • They can divide. • They originate from monocytes. 	<ul style="list-style-type: none"> • Phagocytosis.
Mast Cells	<ul style="list-style-type: none"> • Cytoplasm contains numerous cytoplasmic granules 	Secrete heparin & histamine
Plasma Cells	<p>Basophilic cytoplasm with a negative Golgi image.</p> <p>Nucleus: spherical, eccentric with a clock-face appearance of chromatin.</p> <p>Derived from B-lymphocytes.</p>	Secretion of antibodies (immunoglobulins).
Adipose Cells	<p>Large spherical, with a single large fat droplet.</p> <p>Thin rim of cytoplasm at the periphery.</p> <p>Nucleus: flattened, peripheral.</p>	Storage of fat.

CELLS OF C.T.P



Blood vessel

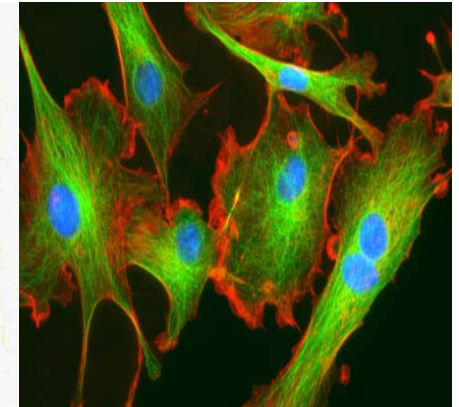
Mast Cells



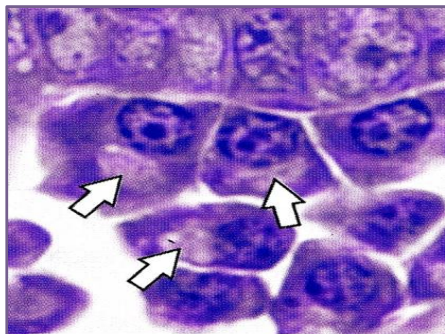
Macrophages



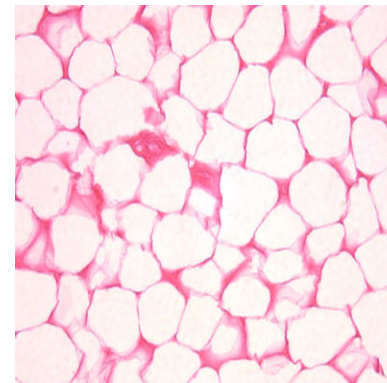
Fibroblasts



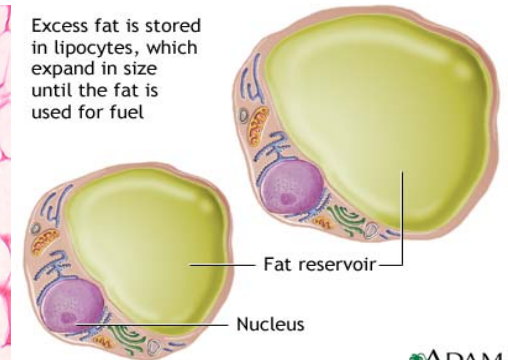
Fibroblasts



Plasma Cells



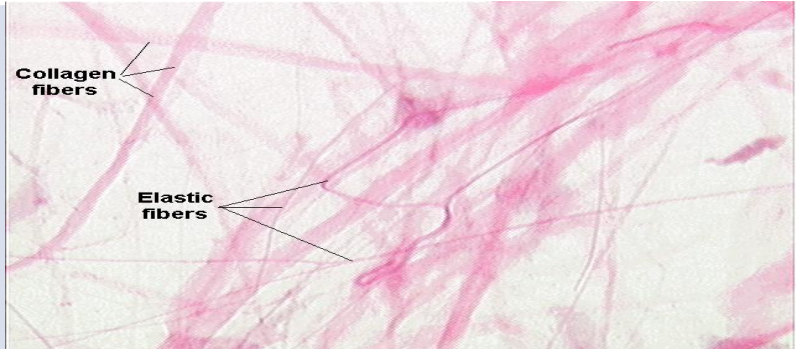
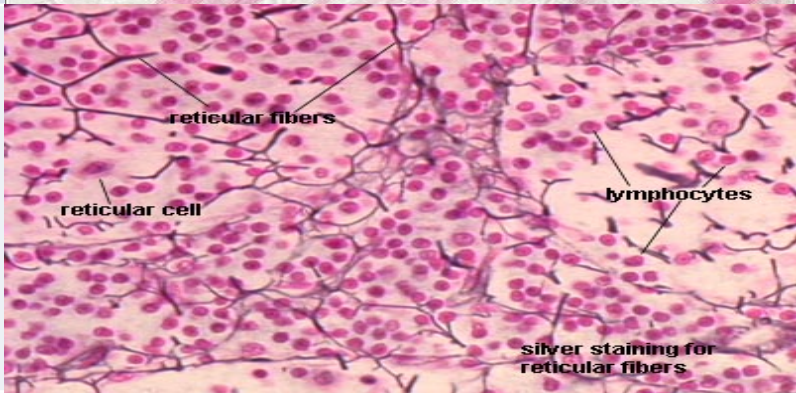
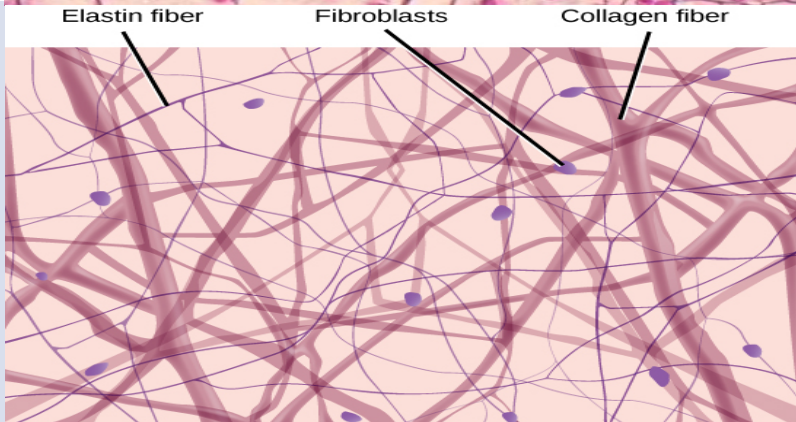
Excess fat is stored in lipocytes, which expand in size until the fat is used for fuel



ADAM.

Adipose Cells

FIBERS OF C.T.P.

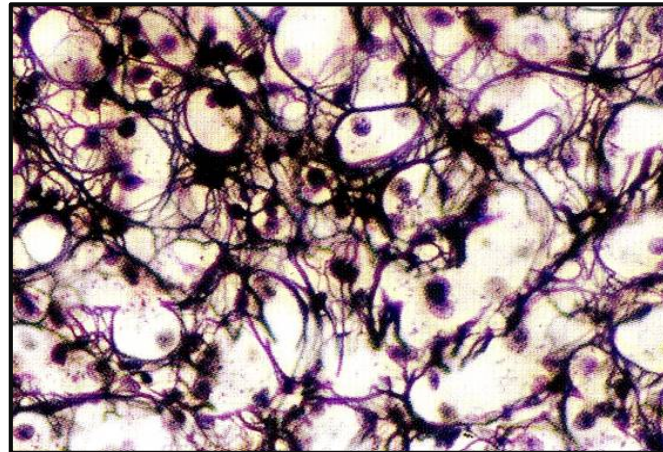
Fibbers	Characteristics	picture
Collagen Fibers	<ul style="list-style-type: none"> • Contain Collagen type I • Non-branched fibers and arranged in bundles • Acidophilic 	 <p>Collagen fibers</p> <p>Elastic fibers</p>
Reticular Fibers	<ul style="list-style-type: none"> • Contain collagen type III • Forms a network • Can only be seen Stained in black with silver 	 <p>reticular fibers</p> <p>reticular cell</p> <p>lymphocytes</p> <p>silver staining for reticular fibers</p>
Elastic Fibers	<ul style="list-style-type: none"> • Forms in Branches • Stained brown with orcein stain 	 <p>Elastin fiber</p> <p>Fibroblasts</p> <p>Collagen fiber</p>

TYPES OF C.T.

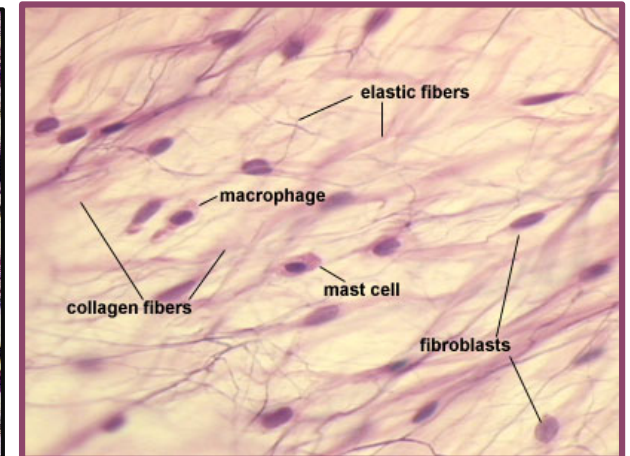
FIBERS	UNDER LIGHT MICROSCOPE	SITES
LOOSE (AREOLAR) C.T.	Contains all the main components of C.T.P	Subcutaneous tissue
DENSE COLLAGENOUS C.T.	Predominance of collagen fibers and Fibroblasts	Dense irregular: <ul style="list-style-type: none"> • dermis of the skin • capsule
		Dense regular: <ul style="list-style-type: none"> • Tendons • ligaments
ELASTIC TISSUE	Branching Elastic fibers and Fibroblasts	Aorta
RETICULAR TISSUE	Reticular fibers + Reticular cells (specialized fibroblasts).	Stroma of organs <ul style="list-style-type: none"> • liver • lymph node • spleen
WHITE ADIPOSE TISSUE	Is formed of lobules of unilocular adipose cells.	<ul style="list-style-type: none"> • in buttocks & hips. • Abdominal wall. • Female breast. • Around the kidney.



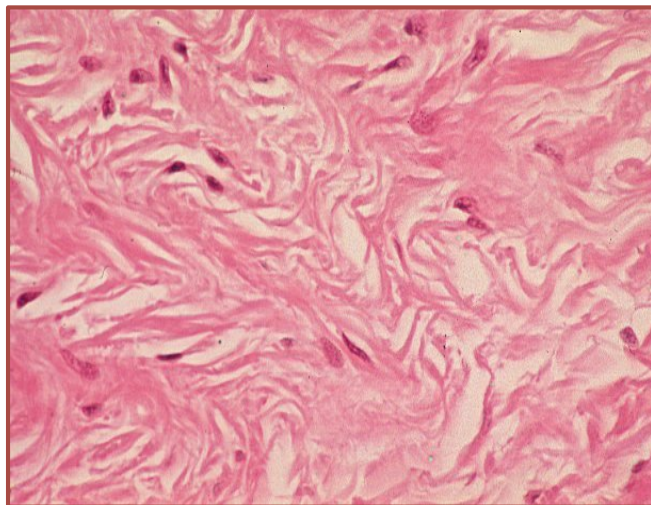
Dense collagenous C.T.
regular



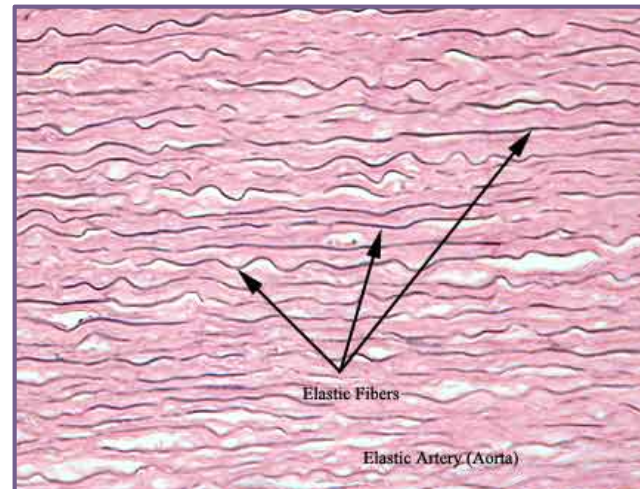
Reticular tissue



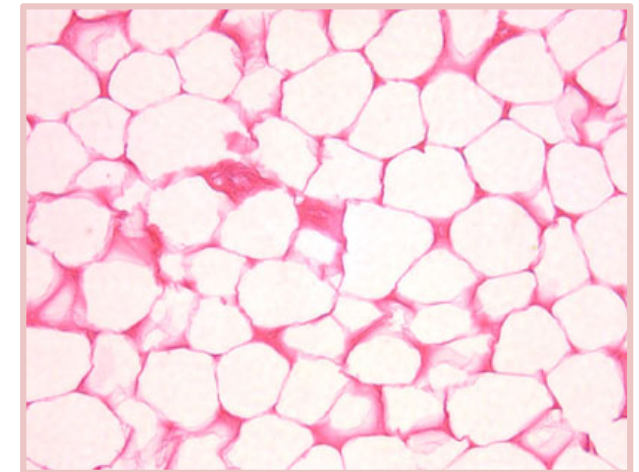
Loose (areolar) C.T.



Dense collagenous C.T.
irregular



Elastic tissue



White adipose tissue

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

Hypercellular obesity

an increase in number of adipocytes, which is a request of increased adipocytes during childhood.

Hypertrophic obesity

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

MCQ's

1. All are characteristics of the connective tissue EXCEPT ?

- A. widely separated cells
- B. Have extracellular matrix.
- C. Tightly joined cells.
- D. Vascular.

2. What are the major components of the connective tissue ?

- A. Cells.
- B. Intracellular matrix.
- C. Fibers.
- D. Extracellular matrix.

3. Which of the following is Not a type of the connective tissue ?

- A. Blood.
- B. Gland.
- C. Cartilage.
- D. Bone.

4. Which of the following cells may increase in size up to four times ?

- A. Fibroblasts.
- B. Mast cells.
- C. Adipose cells.
- D. Plasma cells.

5. Which of the following cells have a clock-face appearance of chromatin ?

- A. Macrophages.
- B. Plasma cells.
- C. Fibroblast.
- D. Mast cells

5.B
4.C
3.B
2.Acd
1-C

Thank you for checking our work...

Done By:

Hadeel Alsulami

Rawa Al Ohali

Najd Al Omran

MOTIVATION CORNER

الشغف بشيء يجعلك خيرا في مجاله،
و يميزك عن الآخرين ..

اسع بكل طاقتك أن تتميز بشغفك،

و كن ممن يكتبون في التاريخ..

BE PASSIONATE ABOUT MEDICINE

For any correction, suggestion or any useful information do
not hesitate to contact us: **Histology434@gmail.com**