



**Department of biology**



***Department of Biology***

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**((Theoretical Histology))**

**Stage (-3-)**

**LEC- ( 7 )**

**Types Connective Tissue**

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## Department of biology



**Connective tissue is classified into**

**Four types:**

**I. proper connective tissue:**

A) loose connective tissue

Example: areolar tissue

B) Dense connective tissue

Example: Dense regular and irregular

\*terms that refer to amounts of collagen fibers present.

**II. Connective tissue with special features:**

A) Reticular tissue

B) Adipose tissue

**III. Embryonic connective tissue:**

Mucous connective tissue

**IV. Supporting connective tissue:**

A) Cartilage

B) Bone



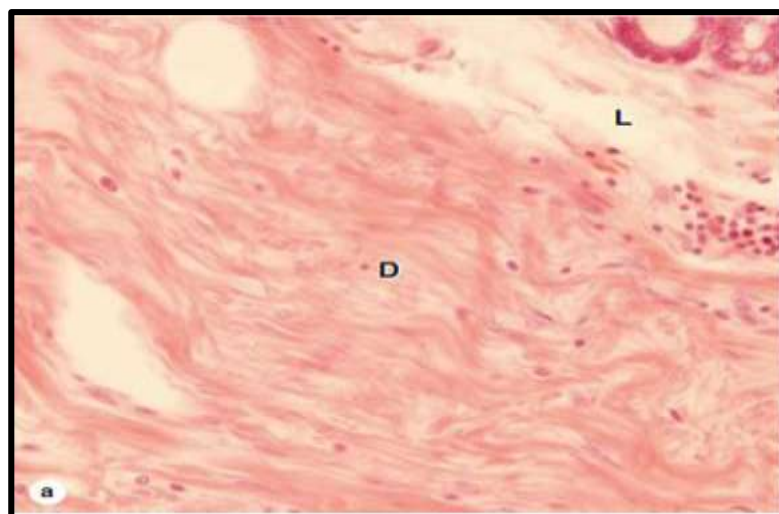
### **I. Proper connective tissue:**

#### **A) Loose connective tissue (areolar tissue)**

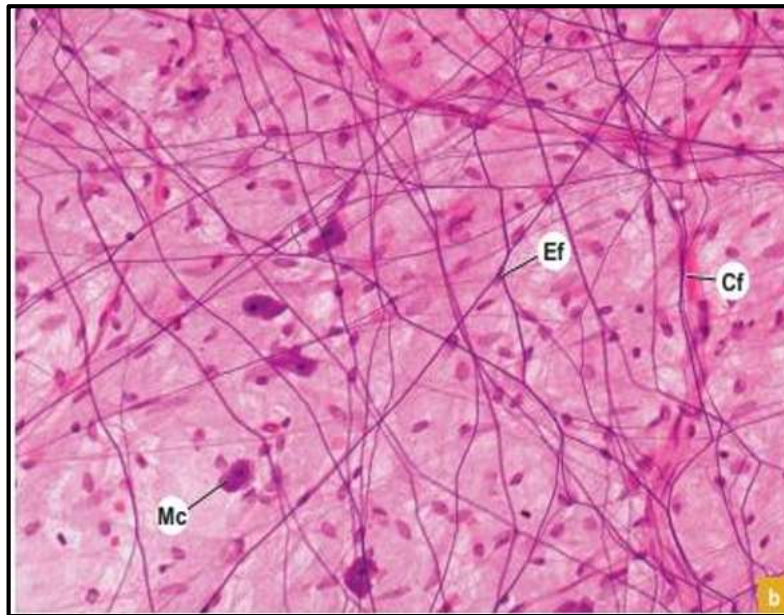
1- It is a vascular, delicate, flexible C.T where the fibers are loosely arranged.

2- It serves as a packing material by filling spaces between various tissue components of an organ and giving it a shape in (**endomysium** – loose connective tissue composed of reticular fibres supporting individual muscle fibre), lamina propria, Subcutaneous region, along nerves, blood and lymphatic vessels, and in glands and mucous membrane, in Mesentery and serous linings.

- 1. support and binding of other tissues**
- 2. Forms the stroma of most organs.**
- 3. composed of: (Cells, Fibers, Ground substance)**



Loose and dense connective tissue



**Loose (areolar) connective tissue**

### **B- Dense Connective Tissue: -**

**this type of connective tissue is characterized by:**

A - It is a tough tensile connective tissue where the collagen fibers are densely packed giving strength and resistance to traction forces

B - large number of **fibers** and small amount of **ground substance** and few cells.

♥ According to the type of fibers, dense connective tissue classified into:

#### **1- Dense White Fibrous connective tissue: two type**

**A) Dense regular white fibrous C.T**

**B) Dense irregular white fibrous C.T**

#### **2- Dense Yellow elastic connective tissue.**





### A) Dense regular white fibrous C.T

It is **whitish in color** this type of tissue provides strong connection between different tissues. In dense regular connective tissue, the collagen fibers are bundled in a parallel fashion. **found in tendons, aponeuroses, ligaments, joint capsules and fibrous coat of the eye.**

**Function:** supporting and withstanding mechanical stress.



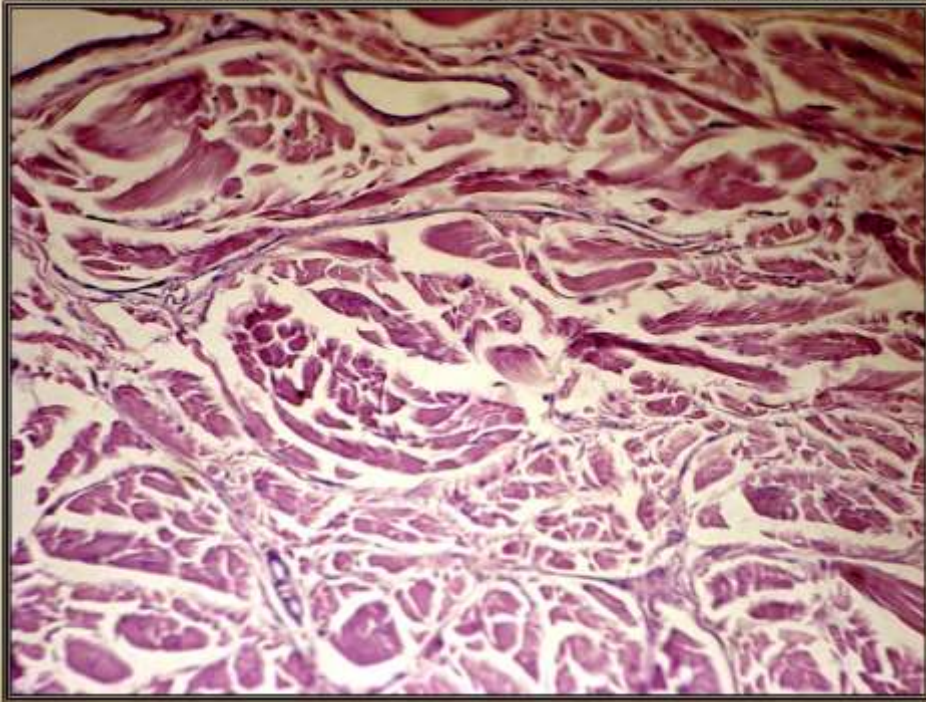
### B) Dense irregular white fibrous C.T

This tissue has fibers that are not arranged in parallel bundles as in dense regular connective tissue. This type of connective tissue produces the tough coverings that package organs, such as the **dermis of the skin and capsules of the kidneys and adrenal glands.**

**Function:** this tissue offers resistance to stress from all directions



White fibrous dense irregular C.T.(Dermis of skin)

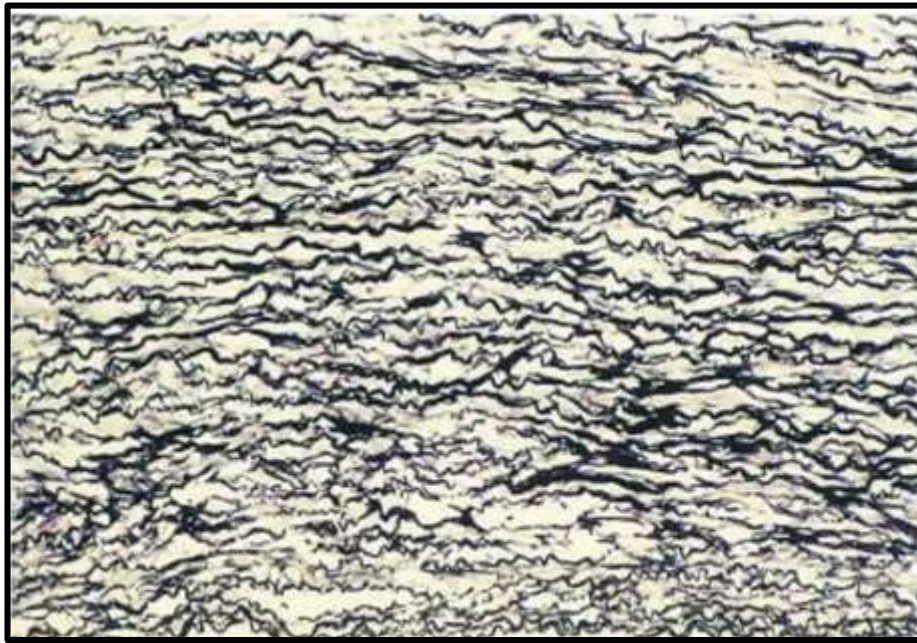


### 2) Dense yellow elastic connective tissue

1. It is composed of elastic fibers which, run in thick parallel bundles with fibrocytes in between.
2. Each elastic bundle is surrounded by small amount of loose connective tissue of fine collagen fibers and fibroblasts.
3. Elastic tissue presents in **ligament nuchae, fenestrated membranes of large elastic arteries and suspensory ligament of penis.**

**Function:** this type of tissue has the ability to **stretch** and **elastic recoil**.

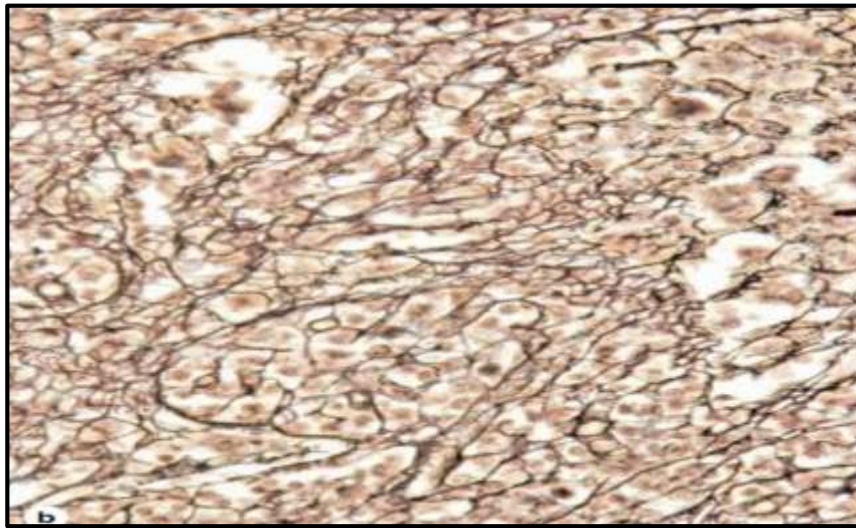




## II. Connective tissue with special features:

### A- Reticular connective tissue

1. It is a specialized type of loose connective tissue providing a framework for lymphoid and endocrine glands.
2. It consists of reticular fibers secreted by reticular cells which are modified fibroblasts.
3. Reticular connective tissue also contains phagocytic cells which monitor the materials passing through sinuses and removes micro-organisms.
4. This connective tissue forms the stroma of many lymphatic organs such as the **spleen, thymus, lymph nodes, and bone marrow.**



### **B- Adipose tissue:**

1. Adipose tissue is one variety of connective tissue with special feature being made up mostly of **fat cells or adipocytes**.
2. **15 – 20%** in males and **20 – 25%** in females is made up of adipose tissue.
3. It is found subcutaneously (in the hypodermis) throughout the body except over the eyelid, penis, scrotum.
4. Male and female fat distribution depends on the sex hormones and adrenocortical hormones.
5. Is a reservoir of energy.
6. Gives shape to the body and keeps some organs in position.
7. Acts as a shock absorber
8. Gives thermal insulation to the body because it is a bad conductor of heat.

**Types of Adipose tissue is of following two types:**

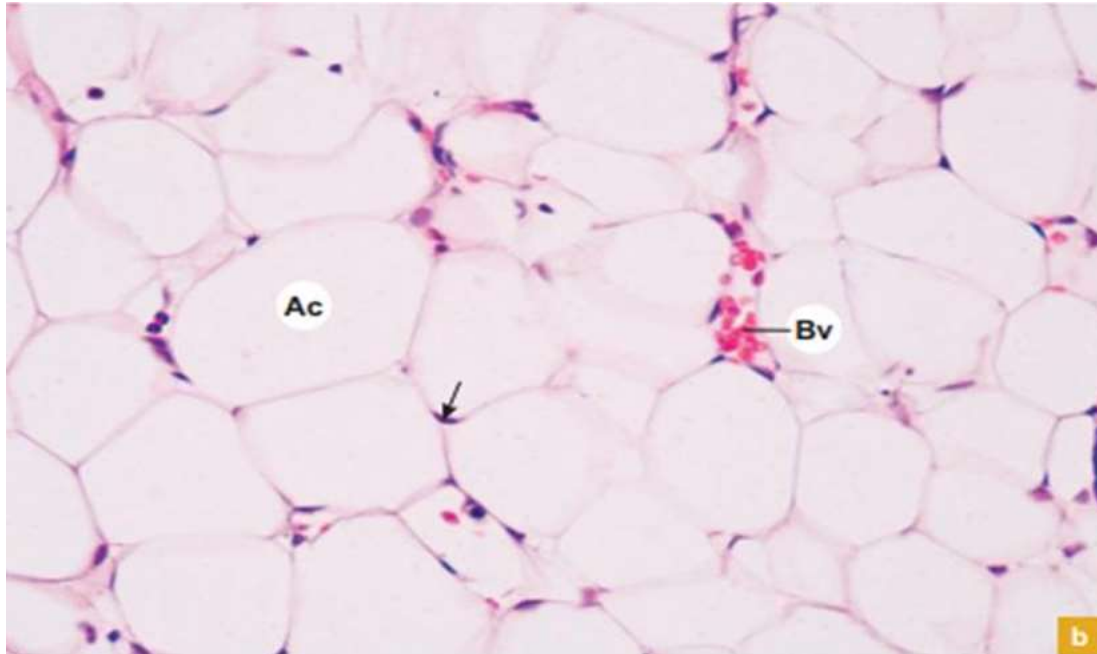
**A-Yellow (white) or unilocular adipose tissue (adult type)**  
around the kidneys, in mesentery, in mediastinum, in axilla and inguinal region.





### **B-Brown or multilocular adipose tissue (embryonic type)**

In new born in the back of neck and around the kidneys to produce heat.



### **Comparative between yellow adipocyte and brown adipocyte**

<b>Characteristics</b>	<b>Yellow adipocyte</b>	<b>Brown adipocyte</b>
<b>Size and shape</b>	Big rounded cell	Small polygonal cell
<b>Number of lipid droplets</b>	Single and unilocular	Many and multilocular
<b>Shape and position nucleus</b>	Flat peripheral nucleus	Spherical central nucleus
<b>Mitochondria</b>	Few and less vascular	Many with long cristae and highly vascular

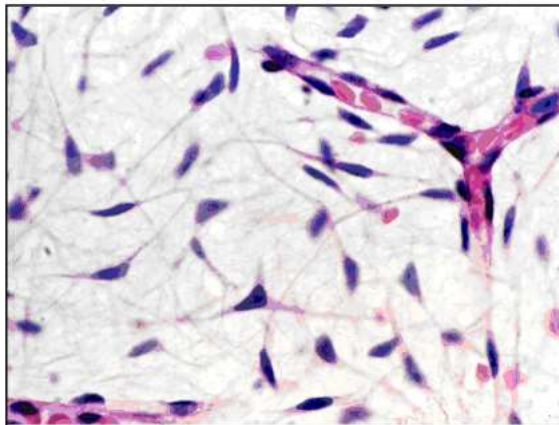


<b>distribution</b>	Widespread and found in adult	Limited found in fetuses and newborn
<b>Function</b>	Store house of energy	Production of heat ( that protects newborn against cold

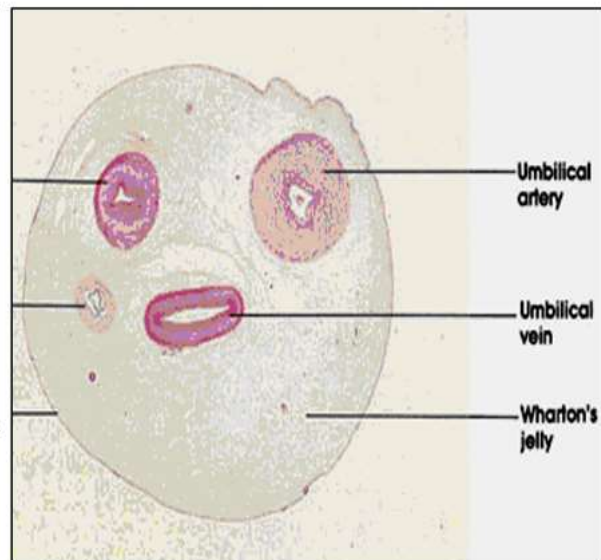
### III. Embryonic connective tissue:

#### Mucous connective tissue:

- 1- It is composed of **stellate-shape fibroblasts** & abundant ground substance (mainly hyaluronic acid) and few fine collagen fibers.
- 2- It is present in **umbilical cord** and called **Wharton`s jelly** and also present in the **pulps of young teeth**.
- 3- It originates from **mesoderm** and has **few cells** and **fibers** and **large amount of intercellular substance**.



*Mucous connective tissue with few cells and fibers*



*The umbilical cord (Wharton's jelly), an example of mucous CT*