

Almaaqaal University
College of Health and Medical Techniques
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Lectures in Histology laboratories for 2nd year students

By
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Lecture 3

Connective tissue

Connective tissue

- It is called connective tissues because it connects the tissues and organs in the body. The main characteristic that distinguishes these tissues from other types is that they consist of cells separated from each other by an extracellular matrix, this non-living substance is the basis for classifying the connective tissues into subgroups.

- **The connective tissue consists of :**

1- cells : It is the basis that produces the most important substance. There are **two type** of cells in connective tissue:

A) Resident cells (fixed cells)

B) Transient cells (free cells)

- **A) Resident cells (fixed cells)**

- 1. Fibroblasts and fibrocyte
- 2. Pericyte
- 3. Macrophages
- 4. Mast cells
- 5. Myofibroblast
- 6. Melanocytes
- 7. Adipocytes

- **B) Transient cells (free cells)**

- 1. Plasma cell
- 2. Lymphocyte
- 3. Leukocyte

- **2- Extracellular Matrix :**

- a- **protein fibers.**
- b- **Ground substance** : It consists of non-fibrous proteins and other molecules (cartilage & bone).
- c- **Fluid (blood).**

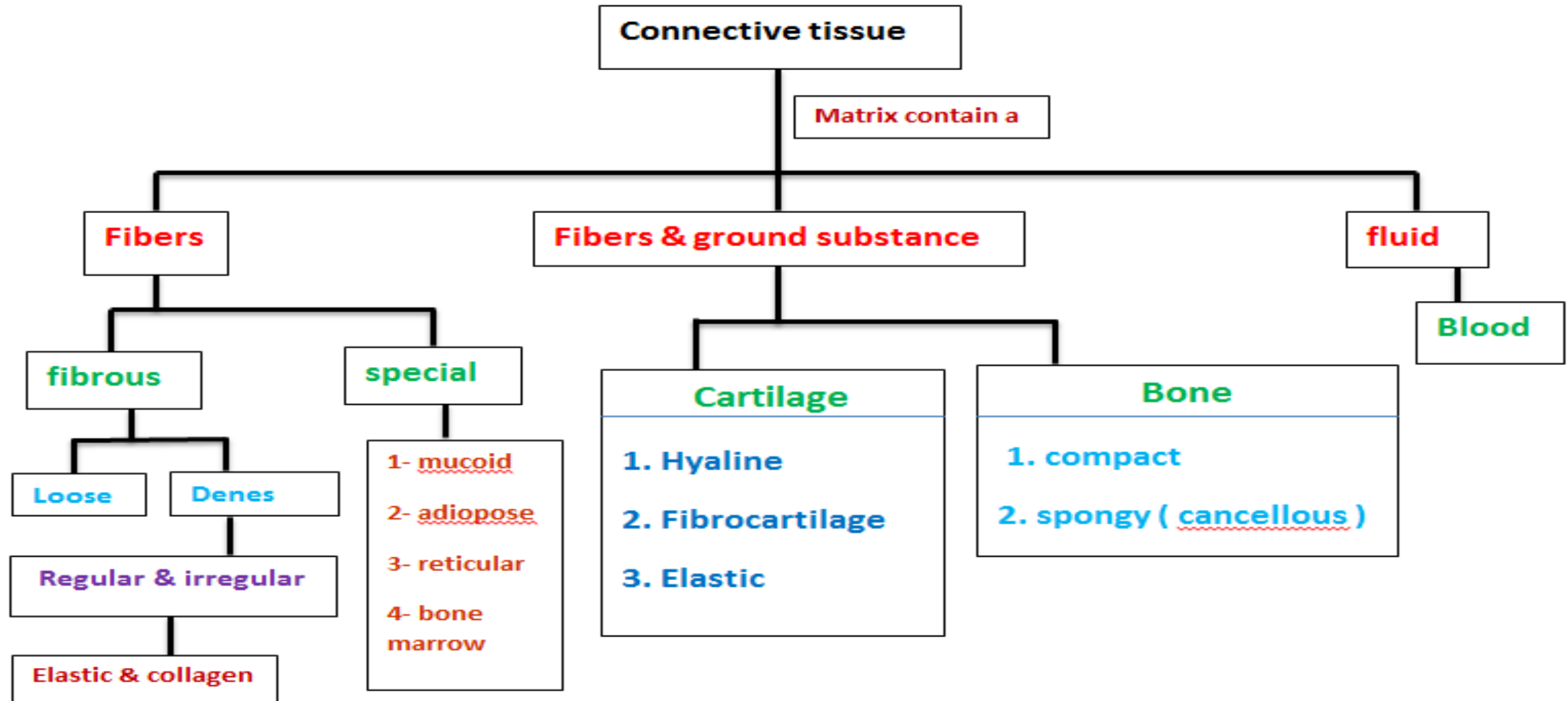
a- **Protein fibers** : There are three types :

1- collagen fibers : They appear in very strong, flexible, but not stretchy bundles, and they may sometimes be called white fiber.

2- Reticular fibers: The fibers are very short, thin and branch off to form a reticular .

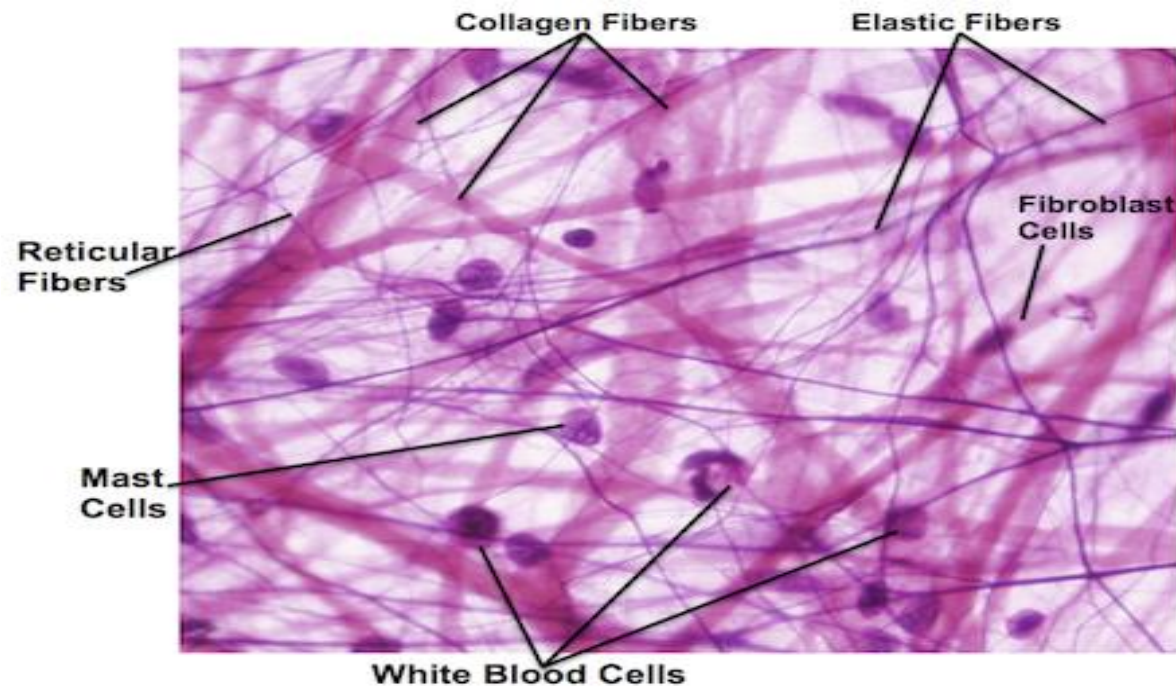
3- Elastin fiber : The spiral fibers are tiny coiled and are shown by microscopic examination in the form of branched also called yellow fiber .

Classification of connective tissues



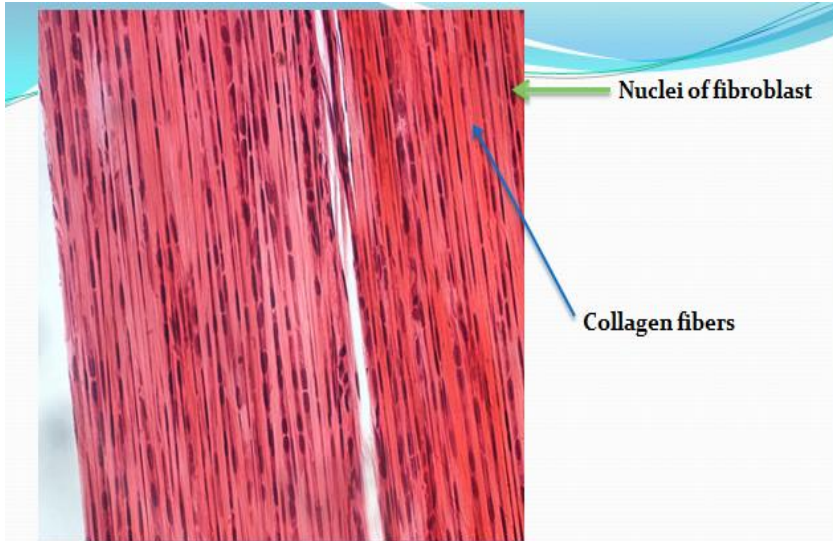
- **A) Fibrous connective tissue;**

- **1- loose or areolar fibers C.T.** Gel-like matrix with all three fiber types; cells: fibroblasts, macrophages, mast cells, and some white blood cells.
- **Location:** Widely distributed under epithelia of body.

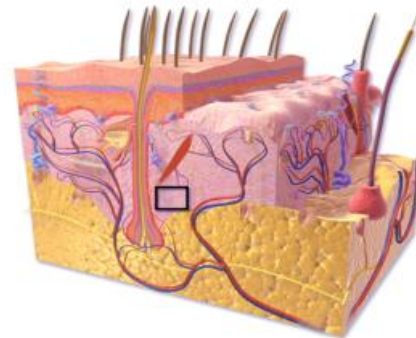


—2- denes or regular fibers C.T.

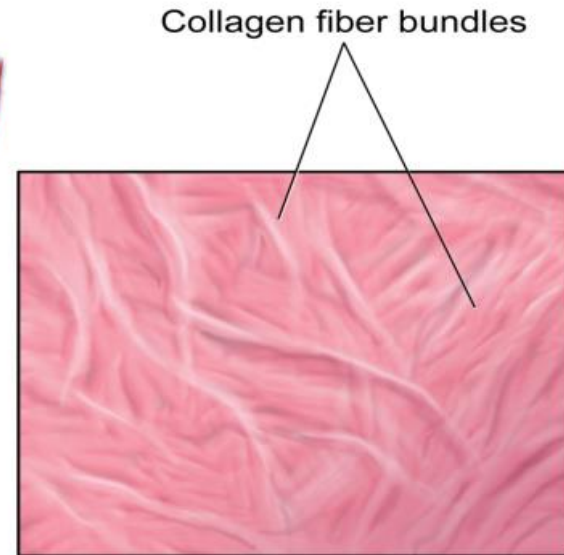
- The arrangement of the fibers is **regular** and is of **two types**:
- 1- **Collagenous (White fibrous)**: Represented by tendon which **connects the bones with the muscles**, the tissue appears as **bundles of collagen fibers parallel to each other** and blocked by the fibroblasts.



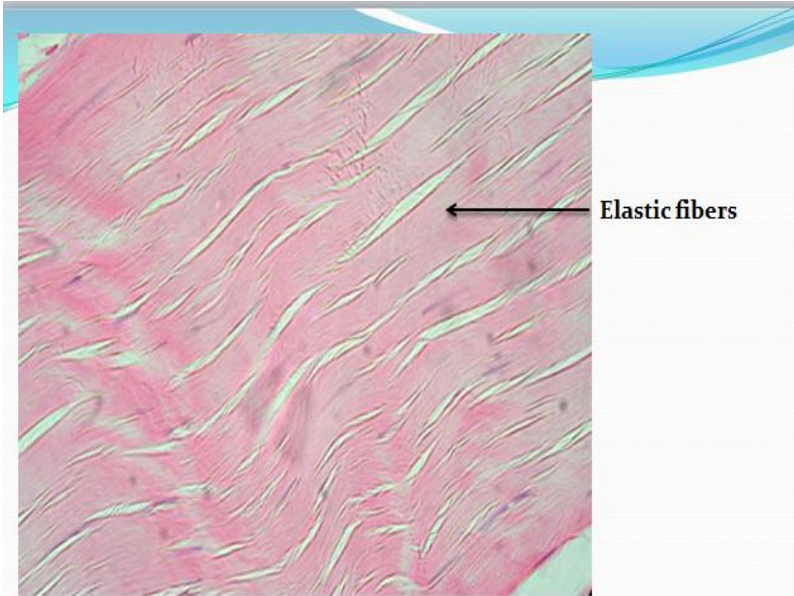
Dense regular collagenous connective tissue



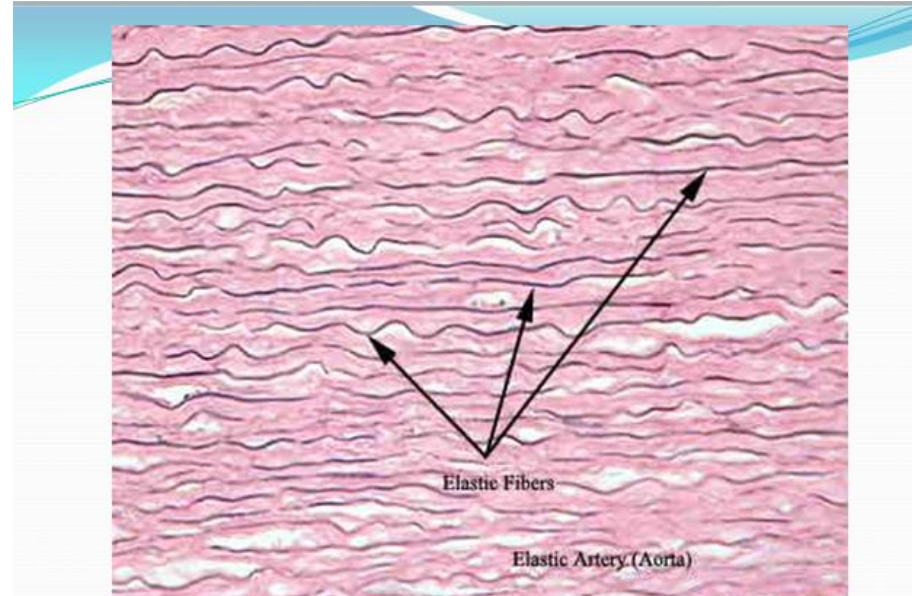
Dense Irregular
Connective Tissue
Deep Dermis



- **2- Elastic (Yellow fibrous):** Represented by **ligaments Connecting bones to each other** is made up of elastic fibers, between which the fiber-generating cells appear as the ligaments between the vertebrae.

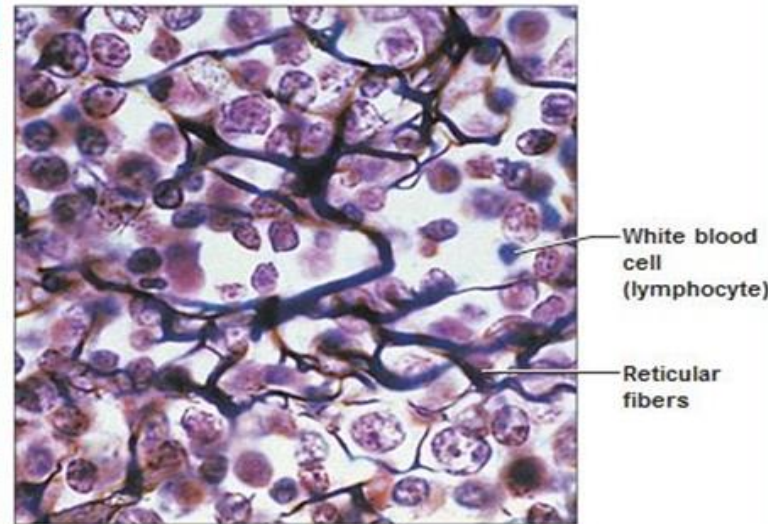


dense regular Elastic connective tissue



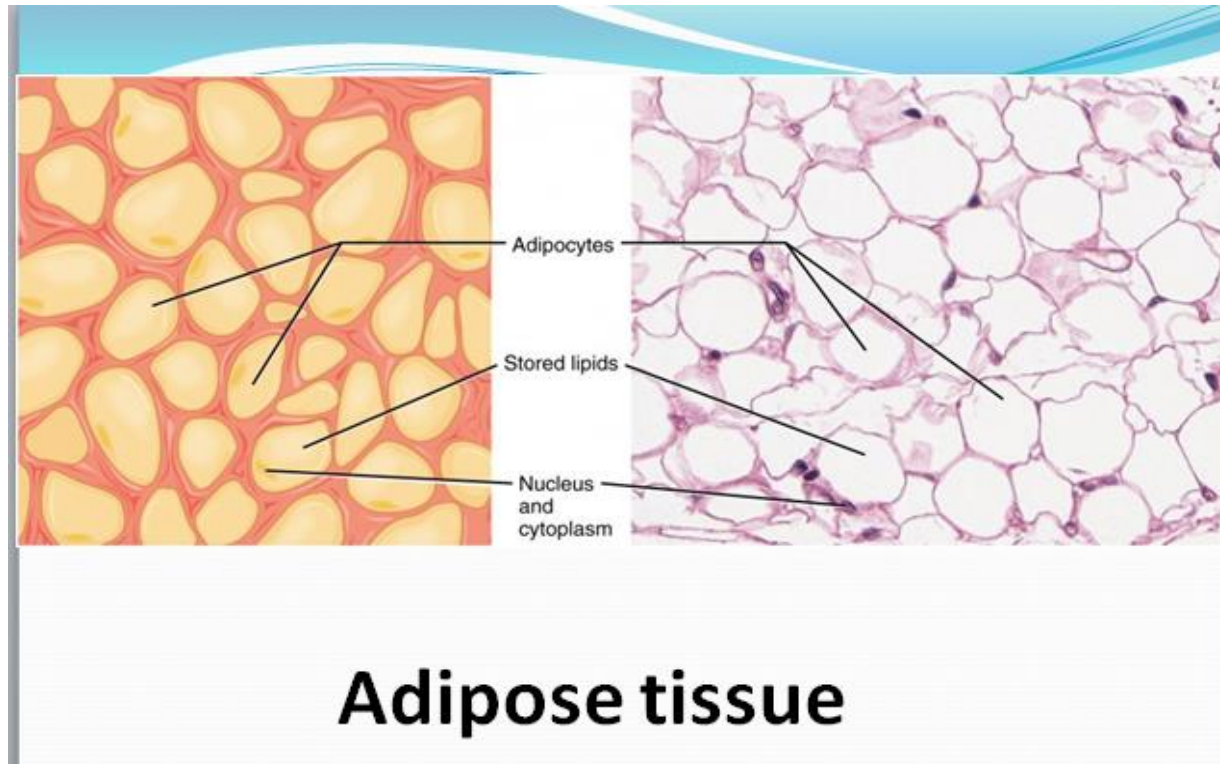
dense irregular Elastic connective tissue

- **Special fibers connective tissue**
- **1-Reticular Tissue:** Network of reticular fibers in a typical loose ground
- **substance;** reticular cells lie on the network.
- **Location:** Lymphoid organs (lymph nodes, bone marrow, and spleen).

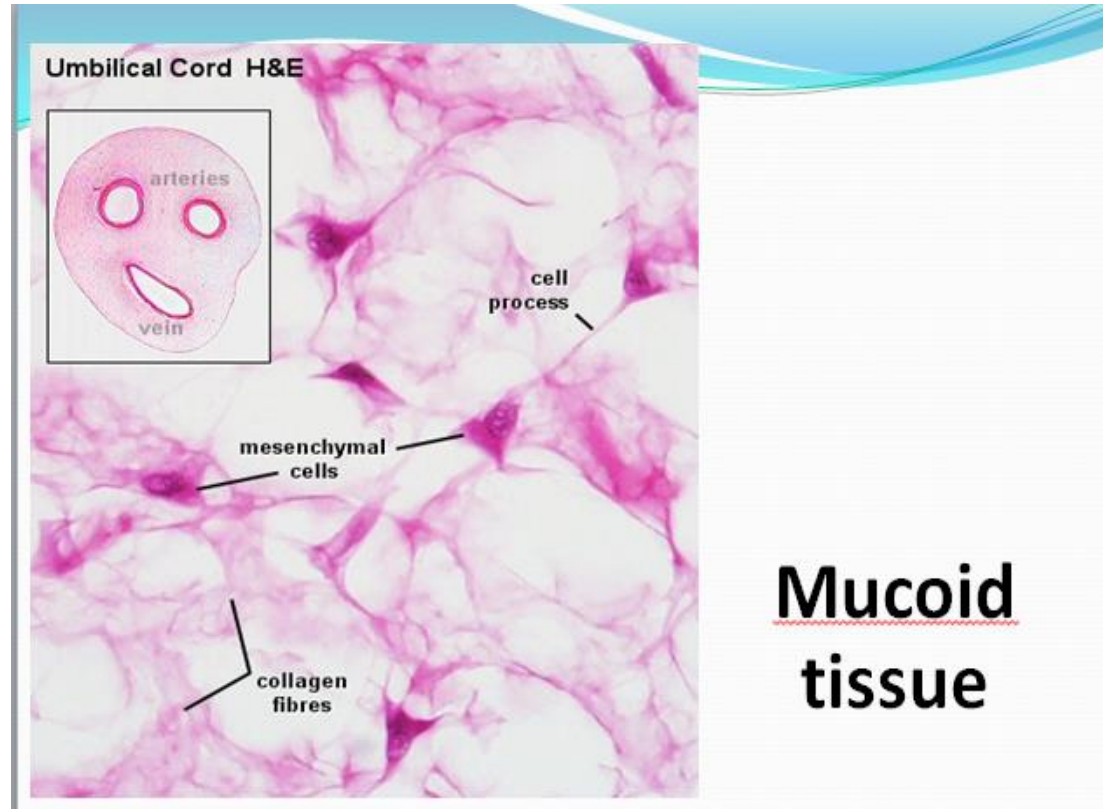


Reticular tissue

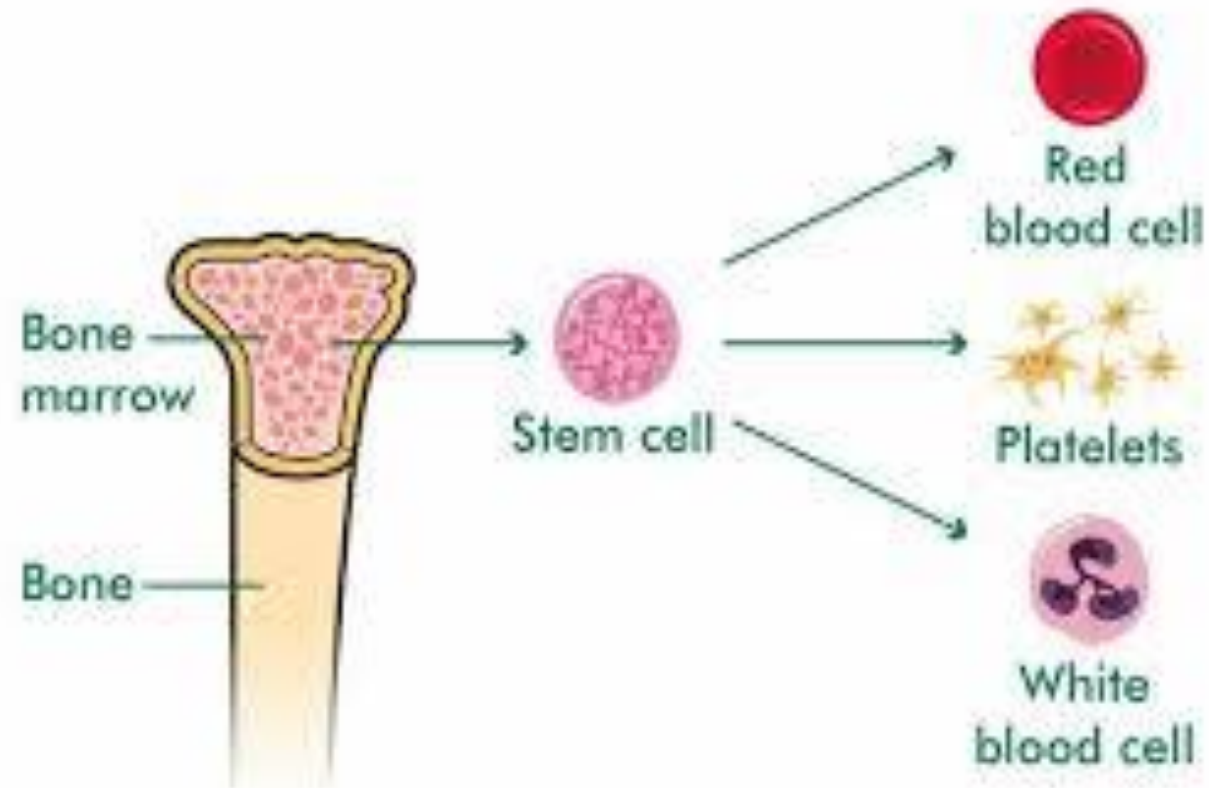
- **2- Adipose tissue** : Matrix as in areolar, but very sparse; closely packed adipocytes, or fat cells, have nucleus pushed to the side by large fat droplet.
- **Location**: Under skin in the hypodermis; around kidneys and eyeballs; within abdomen.



- **3- Muroid tissue:** It is found in **the umbilical cord** The interface material appears transparent and is present in it **fibroblast , lymphocyte, and macrophage.**



- 4. bone marrow:



thankS