جامعة المستقبل
كلية العلوم
علوم التقانة الاحيائية الطبية

GENERAL BIOLOGY

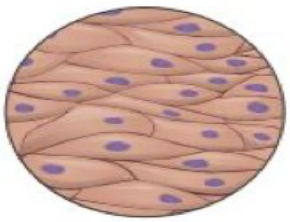
1St. Stage

Lec. 6

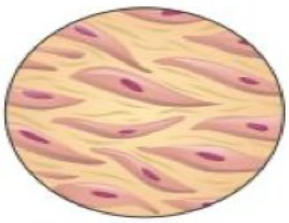
2nd. course

CONNECTIVE TISSUE

BY
DR. MOHAMMED AL-MURIB

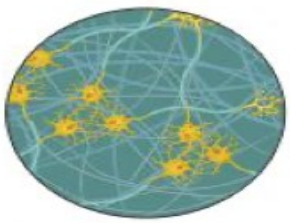


Epithelial tissue covers the body surface and lines body cavities.



Connective tissue supports and protects organs.

Muscle tissue generates force to allow movement.



Nervous tissue uses electrical signals for communication.

Connective tissues

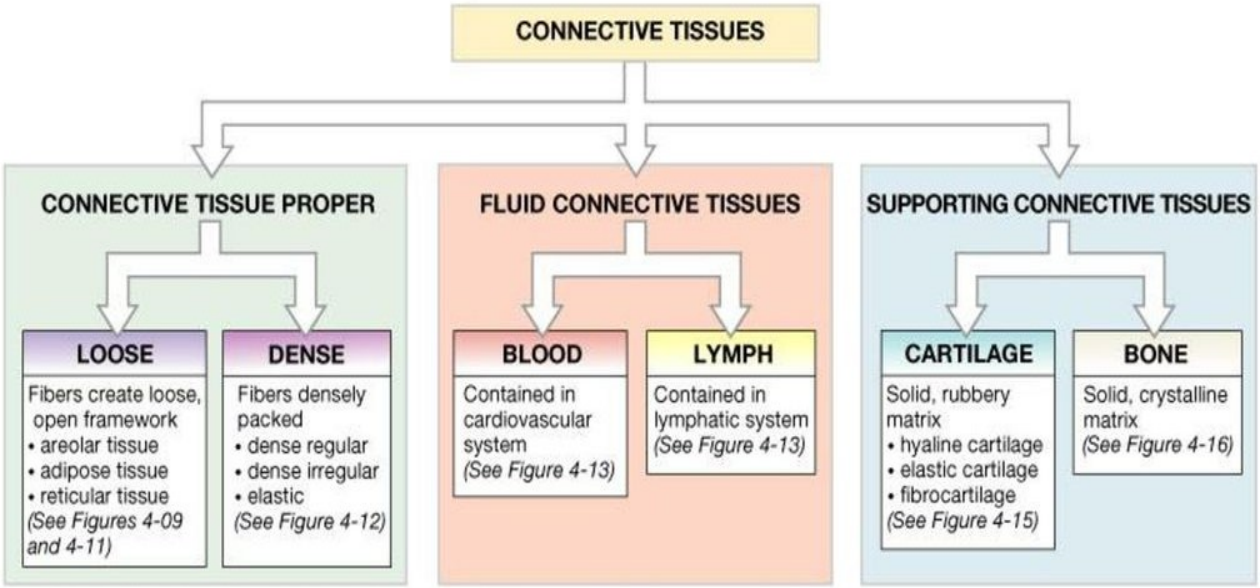
- Connective tissue is the most abundant and widely distributed tissue in the body .

- Connective tissue has three main components: cells, fibers, and ground substance. Together the ground substance and fibers make up the extracellular matrix.

Functions of connective tissues

1. Pending and supporting
2. Protecting
3. Insulating
4. Transporting substances within the body.

Types of Connective Tissues



❖ *Proper connective tissue*

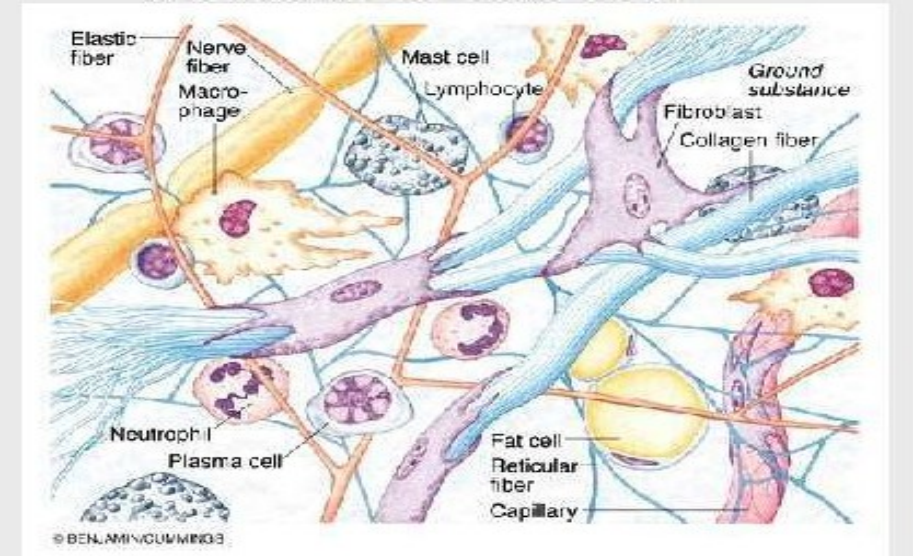
A. Loose connective tissue

1. Areolar Connective tissue

- They forms a loose network in intracellular material .
- It consists of collagen, elastic fibers, reticular fibers and several kinds of cells.
- **Location:** Below the skin, fill space between muscles.
- **Functions:** It gives strength, elasticity and support to tissue.

❖ *Proper connective tissue*

A. Loose Connective Tissue \ 1. Areolar Connective tissue



❖ *Proper connective tissue*

A. Loose connective tissue

2. Adipose Connective tissue

It consists of adipocytes which stores fat.

Location:

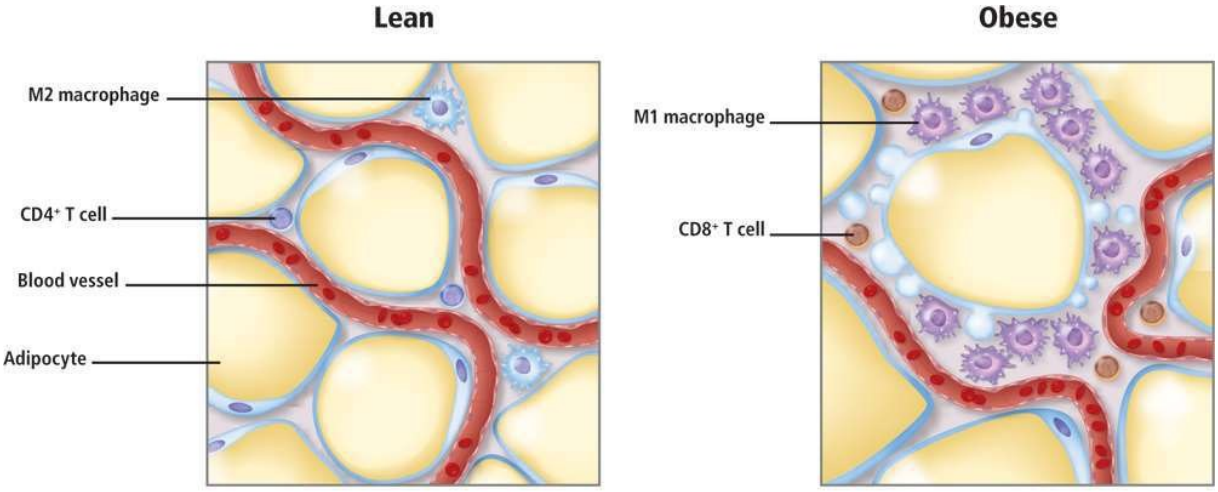
It is present in subcutaneous layer deep in the skin, around the heart and kidneys

Functions :

- Prevents heat loose from body.
- Energy supply.
- Protects organ from injury.

❖ *Proper connective tissue*

A. Loose Connective Tissue \ 2. Adipose Connective tissue



❖ *Proper connective tissue*

A. Loose connective tissue

3. Reticular Connective tissue

It contains reticular fibers and reticular cells.

• Location:

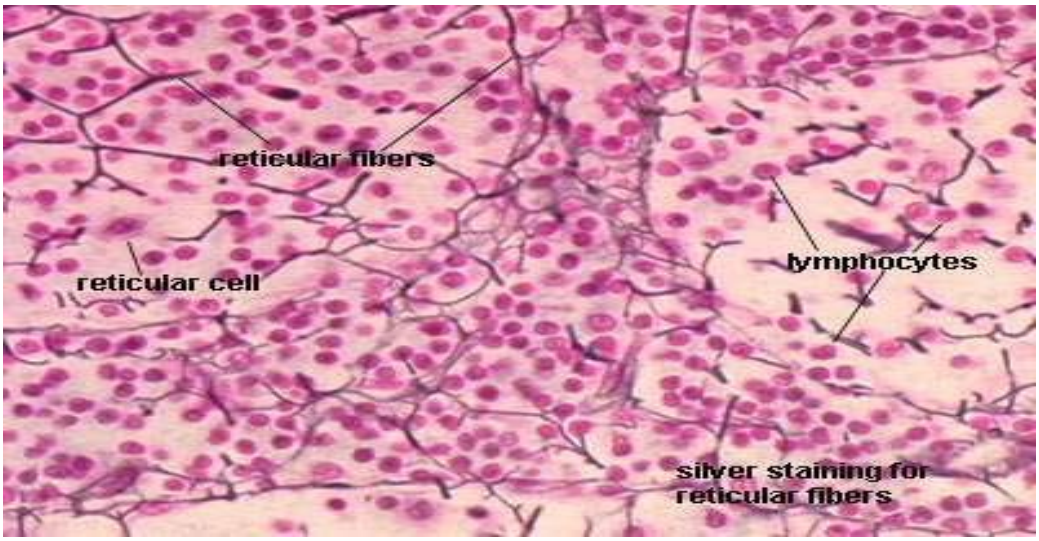
It is present in the supporting framework of liver, spleen, lymph nodes, red bone marrow and it is also found around blood vessels and muscles.

• Functions:

It binds together smooth muscle tissue cells, filters and removes microbes in the lymph node.

❖ *Proper connective tissue*

A. Loose Connective Tissue \ 3. Reticular Connective tissue



❖ *Proper connective tissue*

B. DENSE connective tissue

1. Fibrous regular Connective tissue

Bundles of collagen fibers are arranged in parallel patterns to provide strength to tissue.

- Fibroblast are appear in rows between the fibers.
- It is tough in nature.

Location:

It forms tendons (attach muscle bone) and ligaments(attach bone to bone).

Functions:

It provides strong attachment to structure.

❖ *Proper connective tissue*

B. DENSE connective tissue

2. Fibrous Irregular Connective tissue

It contains collagen fibers which are irregular arranged and a few fibroblasts are appear in rows between the fibers.

Location:

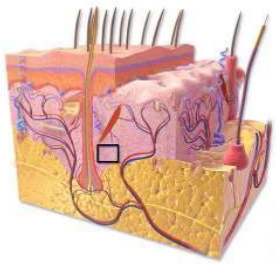
It present in dermis layer of skin, membrane capsules around kidneys, liver, testes and lymph node, heart valves.

Functions:

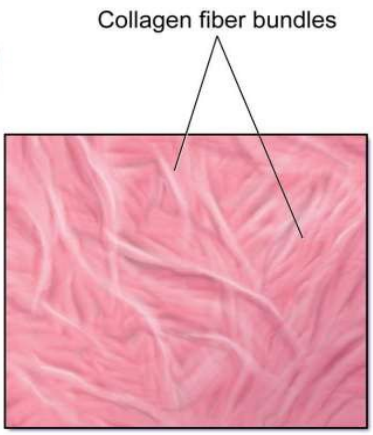
It provides strength to different organs.

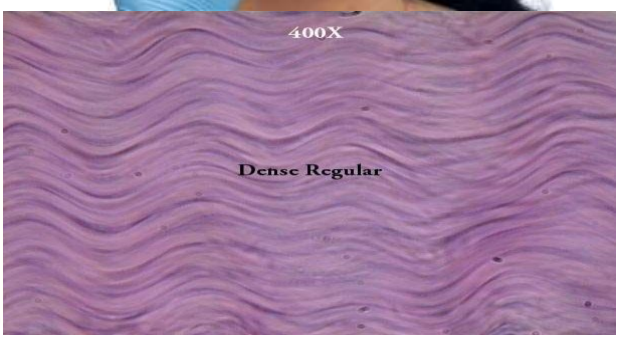
❖ *Proper connective tissue*

B. DENSE connective tissu



Dense Irregular Connective Tissue
Deep Dermis





❖ *Proper connective tissue*

B. DENSE connective tissue

3. Elastic Connective tissue

It consists of freely branching elastic fibers.

- Fibroblast are present in space between fibers.
- It is yellowish in colour.

Location :

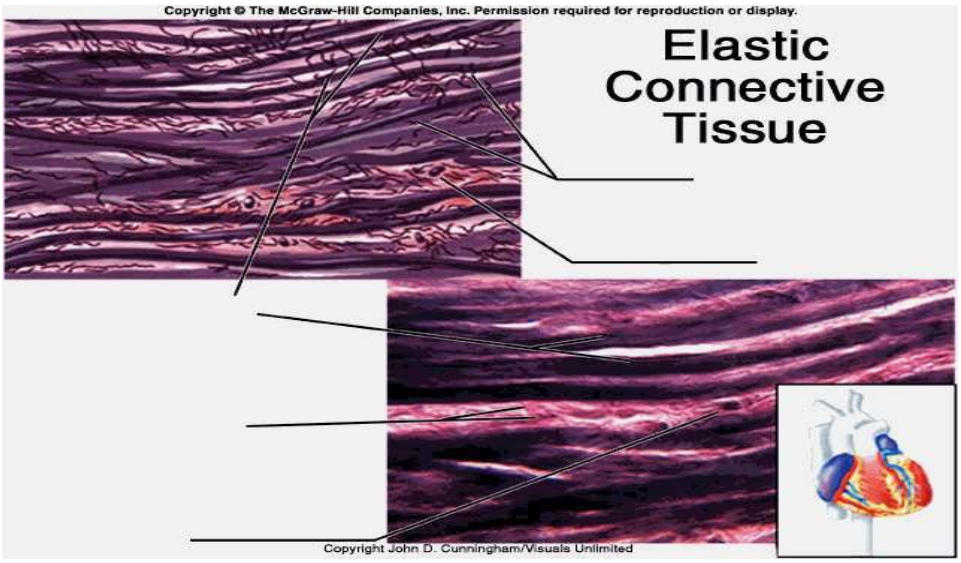
It is present in walls of elastic arteries and trachea.

Functions :

It allows stretching of various organs.

❖ *Proper connective tissue*

B. DENSE connective tissue



❖ *Supporting connective tissue*

A. Cartilage connective tissue

1. Hyaline Cartilage

It is bluish white in color.

•It consists of fine collagen fibers and many chondrocytes.

Location:

It is present at the end of long bones, anterior ends of ribs, nose and parts of larynx ,trachea.

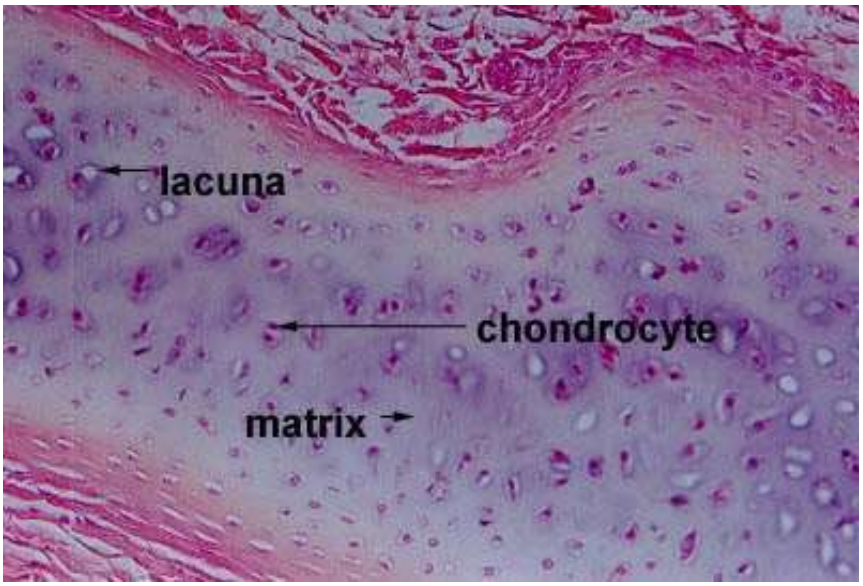
Function:

It provides movement at joints, flexibility and support

❖ *Supporting connective tissue*

A. Cartilage connective tissue

1. Hyaline Cartilage



❖ *Supporting connective tissue*

A. Cartilage connective tissue

2. Fibro Cartilage

It is strongest form of cartilage.

•The chondrocytes are scattered among the bundle collagen fibers.

Location:

It is present in inter-verteblar disc.

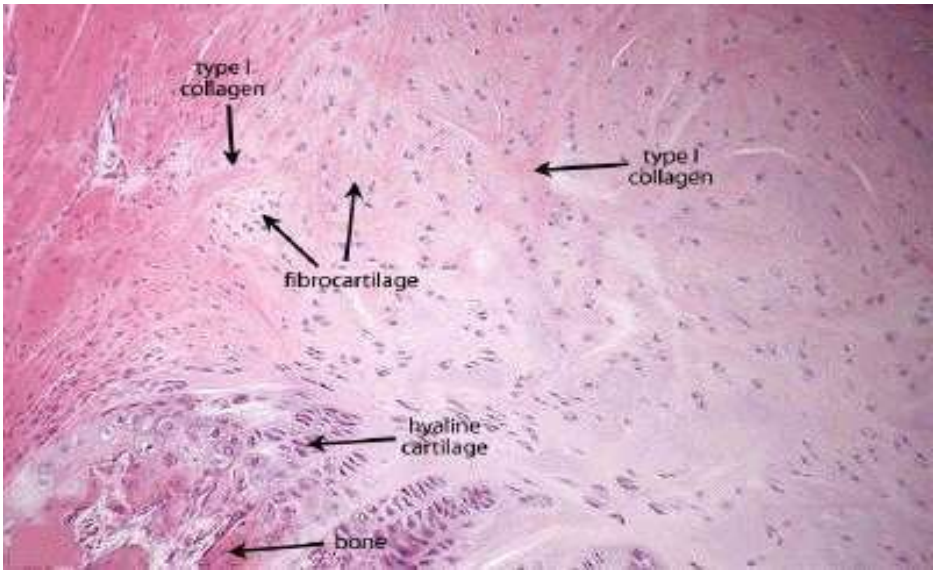
Functions:

It covers and protects bony structures of body.

❖ *Supporting connective tissue*

A. Cartilage connective tissue

2. Fibro Cartilage



❖ *Supporting connective tissue*

A. Cartilage connective tissue

3. Elastic Cartilage

- The chondrocytes are located within a thread like network of elastic fibers.

Location:

It is present in pinna of ear and top of larynx.

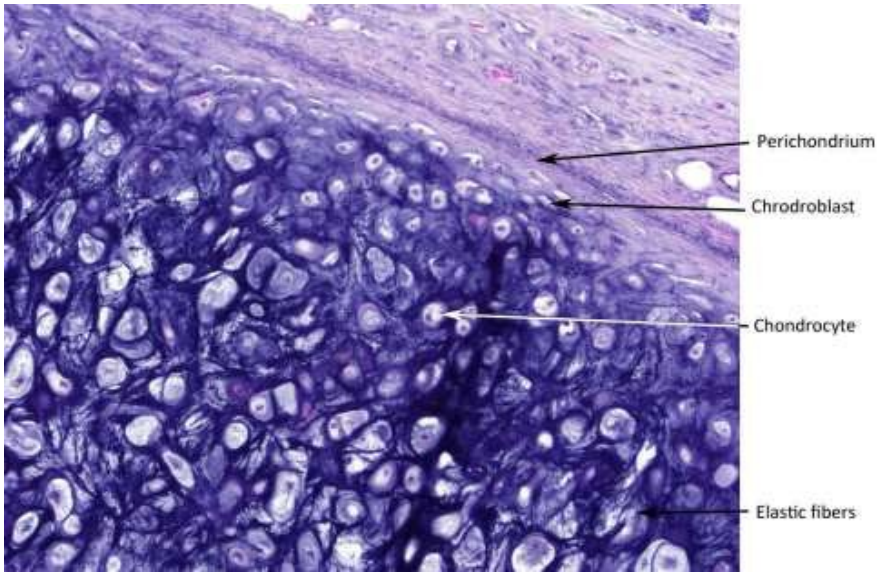
Functions:

It provides strength, elasticity and maintain the shape of certain organs such as the external ear.

❖ *Supporting connective tissue*

A. Cartilage connective tissue

3. Elastic Cartilage



❖ *Supporting connective tissue*

B. Bone connective tissue

1. Compact Bone

- The compact bone is the main structure in the body for support, protection and movement.

Osteons – Functional units of mature compact bone.

Osteocyte – A cell which function to repair bone tissue.

Osteoblast – Cells which form new bone tissue.

Location:

Most of skeleton bones specially long bones.

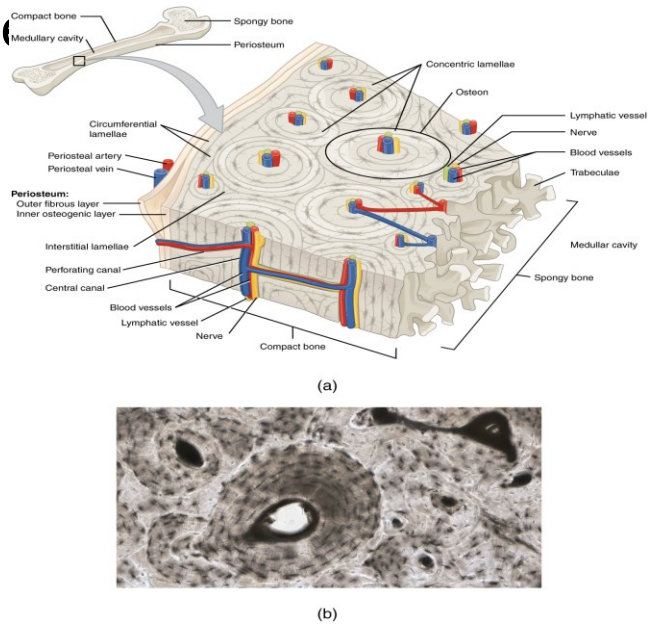
Functions:

storing and releasing calcium, create movement with muscles.

❖ *Supporting connective tissue*

B. Bone connective tissu

1. Compact Bone



❖ *Supporting connective tissue*

B. Bone connective tissue

2. Spongy Bone

•Spongy bone is lighter, weaker, more flexible and less dense than compact bone.

Location:

at the ends of the long bones, inside the vertebrae, in the ribs, in the skull and in the bones of the joints.

Functions:

Storage of Bone Marrow, produced RBC and Mineral Storage.

❖ *Supporting connective tissue*

B. Bone connective tissue

2. Spongy Bone