Connective Tissue

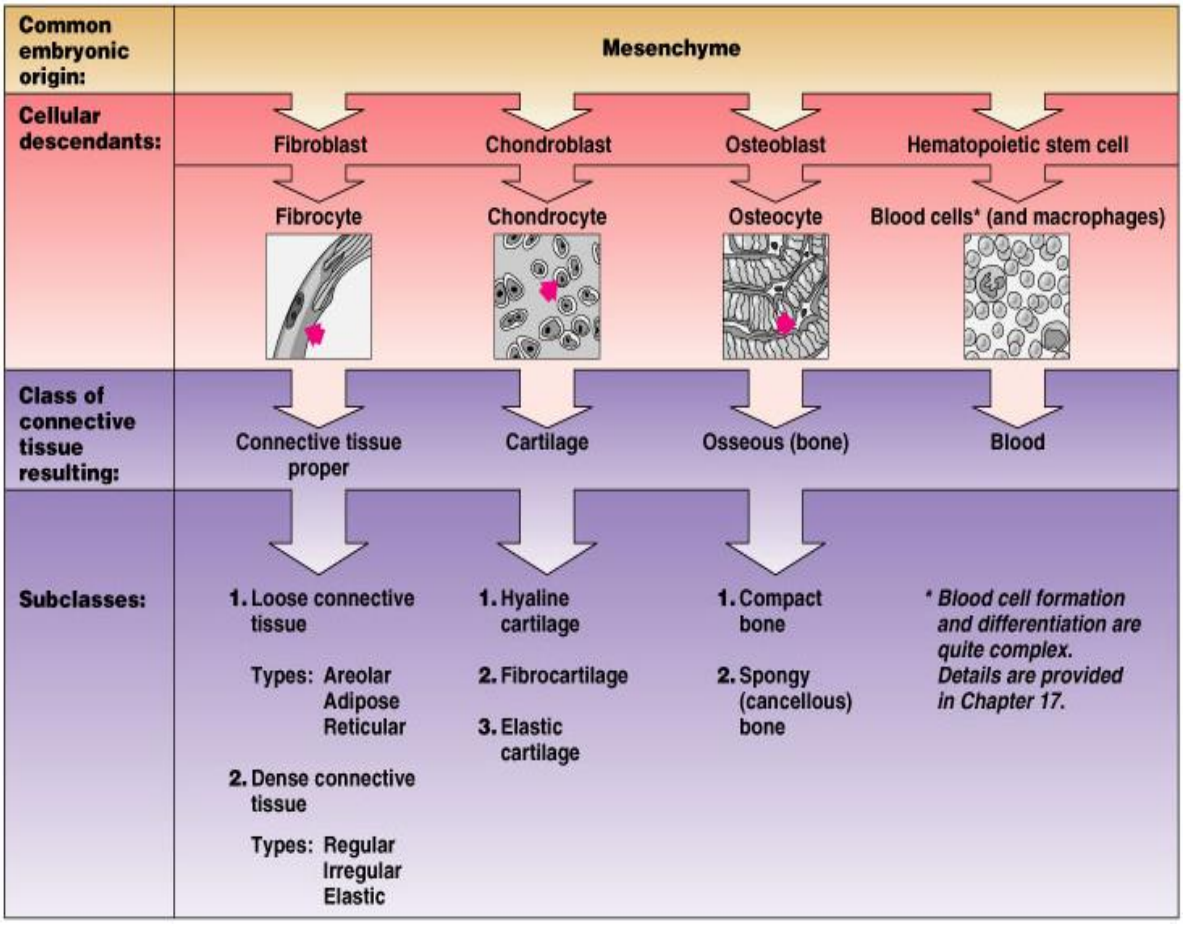
General Description: 1-Composed of many cells types producing fibers and matrix.
2-Originated from mesenchymal tissue of embryo.

3-Many functions such as: connecting, supporting& movement (bone), storage and transporting(blood).

Connective tissue components:

1. **Cells**: fibroblasts, Macrophages, lymphocytes (antibody producing cells), adipocytes (fat cells), mast cells and stem cell.
2. **Ground substance/matrix**: (space filler) non-cellular, separates cells, varies in consistency (solid, semifluid, or fluid). Composed of proteoglycans =protein +glycosaminoglycan (GAG)
3. **Protein fibers**: a balance between strength and flexibility include:
   a) Collagen: *flexibility* and *strength- high tensile strength* (can resist pulling force). Made up of thick bundles of collagen fibers (white).
   b) Reticular fibers: *delicate support* networks made of thin, branching collagen fibers (e.g. Spleen & liver)
   c) Elastic fibers: made of yellow elastin fibers (not collagen) which are flexible but weak.

Classes of connective tissue



Embryonic connective tissue:

Mesenchyma	Mucoid
Many undifferentiated Mesenchyma cells, many fiber with uniform matrix	Random fibroblasts and collagen fibers in viscous matrix
Contains stem/progenitor cells for all adult C.T. cells	Supports and cushions large blood vessels
Mesodermal layer of early embryo	Fetal umbilical cord

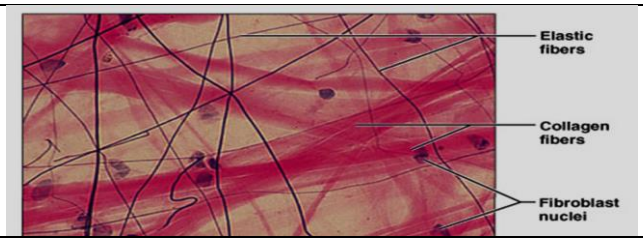
Connective tissue proper:

1-Loose Connective Tissue

A-Areolar Tissue

- Loose arrangement of collagenous and elastic fibers; scattered cell types; abundant ground substance

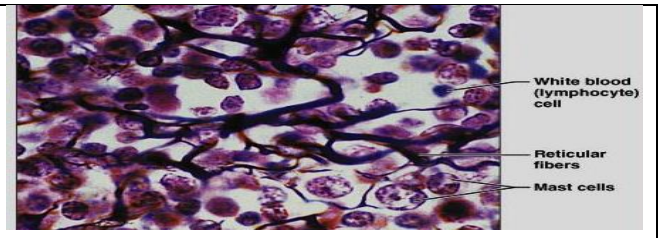
Locations- Underlying all epithelia; surrounding nerves, blood vessels.



B- Reticular Tissue

- Network of reticular fibers in loose ground substance

Found in lymphoid organs and spleen.



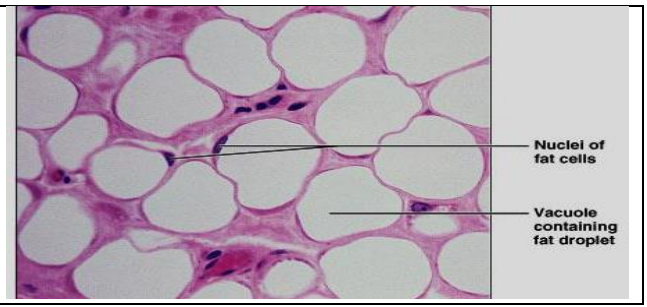
C-Adipose Tissue

- Closely packed adipocytes
- Have nucleus pushed to one side by fat droplet

Function

- Provides reserve food fuel
- Insulates against heat loss
- Supports and protects organs

Found: Under skin, around kidneys, in breasts.



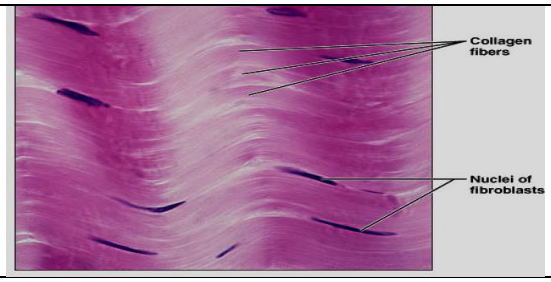
2-Dense Connective Tissue:

a- Dense Regular CT

- Consist of parallel collagen fibers
- Contain fibroblasts and some elastic fibers.

➢ **Function**

Attaches muscle to bone (Tendons).
Attaches bone to bone (ligaments).



b- Dense Irregular CT

- Primarily irregularly arranged collagen fibers
- Contain some elastic fibers and fibroblasts

Function: Provides structural strength

Location: Dermis of skin

➢ Fibrous capsules of joints and organs (e.g. Liver, kidney