

# CONNECTIVE TISSUE

\*Connective tissue cells (C.T Cells) divided into :

1-Fixed cells (remain in connective tissue): include :

A.UDMC : have an active nucleus , because it is a mother cell and can divide into other cells.

B.Fibroblast (active) and Fibrocyt (inactive)(mature)

\*Fibroblast makes the connective tissue fibers and is rich in basic substances , because it has a ribosomes and endoplasmic reticulum .

\*Fibroblast can't divide , but if and wound happens , it change into Fibrocyt , then divided and repaired .

C.Fat cells :

1-large cells

2-have a rounded or polyhydral nucleus

3-have a large granule ( the granule contains the fats) or fats storage in multi droplets .

4- have an endocrine function ( secret leptin Hormone )

D.Pigment cells :

- 1- storage the brown pigments (especially melanin )
- 2-Melanocytes (type of pigment cells ) Found in skin and iris of eye

Note : The above 4 types of cells come from UDMC

E.Macrophages : Large irregular cell    **Function : phagocytosis**

- 1- its origin from Blood Monocytes
- 2-if they enter the connective tissue , called Histocytes
- 3-if they Found in the skin , called Langerhans
- 4-if they Found in the Bone , called osteoblasts
- 5-if they found in the Brain , called microglia
- 6-if they found in the lung , called alveolar phagocytes
- 7-have Lysosomes contain digestive enzymes

\* Classified into 3 types according to activity :

A.Resident : rested in the tissue

B.Elicited : called when it moves to the stimulus (infection)

C.Activated : when it works

\*We can differentiate between macrophages and other cells by india ink

F. Mast cells : **Function : Secret Histamine (allergy) and Heparin (anti coagulant)**

1-Origin : Haemopoietic stem cell ( in Bone marrow )

2-have a granules consist of Heparin and Histamine (Acidic substances)

3-when we stain it with Toluidine Blue stain , the color becomes purple , because the Heparin sulfate change the blue into red or purple .

G. Plasma cells : large cells have a cartwheel nucleus **Function : sunthesis of antibodies**

1-Origin : B cells

2-secrete antibodies ( proteins ) so they rich in Golgi apparatus

3-basophilic cytoplasm

**\*\*Classification of C.T**

1-Mucoid C.T (Embryonic C.T)

2-Proper : Ground sub is gelatin

3-Modified type , 3 types :

A.fluid : Blood    B.firm : cartilage    C.Hard : bone

Firstly : Mucoïd C.T :

- 1-abundant Ground substance
- 2- Contain both UDMC and Fibroblasts
- 3- Contain collagen type 2 (very thin)
- 4-Found in umbilical cord and **vitreous of the eyeball**

Secondary : Proper C.T , two types :

A.loose C.T: the cells are widely separated , so there are less fibers and much ground sub.

\*Mucoïd , Reticular and Adipose tissues are examples of loose C.T

B.Dense C.T : two types :

- 1- regular Dense
- 2- irregular Dense

\*Loose Areolar C.T :

- 1-Contains all fibers types , the large amount is collagen type 1
- 2-Contains all cells types , especially macrophages and Fibroblast
- 3-Abundant ground substance
- 4-Highly vascularise , so found under Epithelium , and in Dermis of skin.

\*Reticular C.T :

- 1-High amount of Reticular Fibers , synthesised by Reticular cells.
- 2-Found in Highly cellular organs like bone marrow and liver
- 3-Contains collagen type 3 (Reticular collagen)
- 4-Forms a network , helping this process its fibers

\*Adipose C.T:

1-Contains a lot of Fat cells , 2 types :

A. a cell has multicoular droplets :

1-The fat is brown , why ? because there are a lot of mitochondria and it is rich in blood supply and there is . Found in the shoulder of the newborn

B. a cell has a large single granule :

1-The fat is yellow , rich in blood supply and contains Carotenoids .

2-Found under skin (Subcutaneous tissue ) gives the shape of our body , Also found around vital organs.

**Function of Adipose tissue :**

**1-shock absorber**

**2-Storage of energy**

**3-Thermal insulation**

\*Dense C.T:

A.irreggular Dense C.T :

1-contains all types of Fibers , especially Collagen type 1

2-Contains Fibroblast cells

3-little amount of Ground substance

4-little supply of blood

5-The fibers move in contra direction

Found in Dermis of of Skin and works as a capsule of lymph node

B.regular Dense C.T :

1-appears in a bundles

2-White in color (Fascia and ligaments)

C.Elastic C.T : type of regular C.T

1-it is regular in direction , but in arteries , it becomes irregular , Found in large arteries and vocal cords , when we put H and E stain on it , it becomes purple.

