

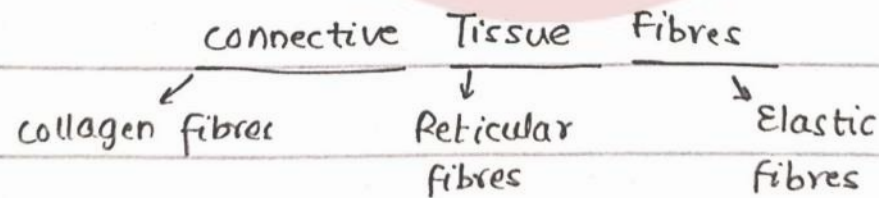
"CONNECTIVE TISSUE"

1. support cells of body/organ
2. medium of exchange
3. Nutrients exchange
4. fats deposition
5. helps the organ in proper differentiation & proliferation.

Connective Tissue Components



1. Ground subs. : i) semi-fluid gel-like with high water
 ii, has GAGS, proteoglycans, glycoproteins (gps)

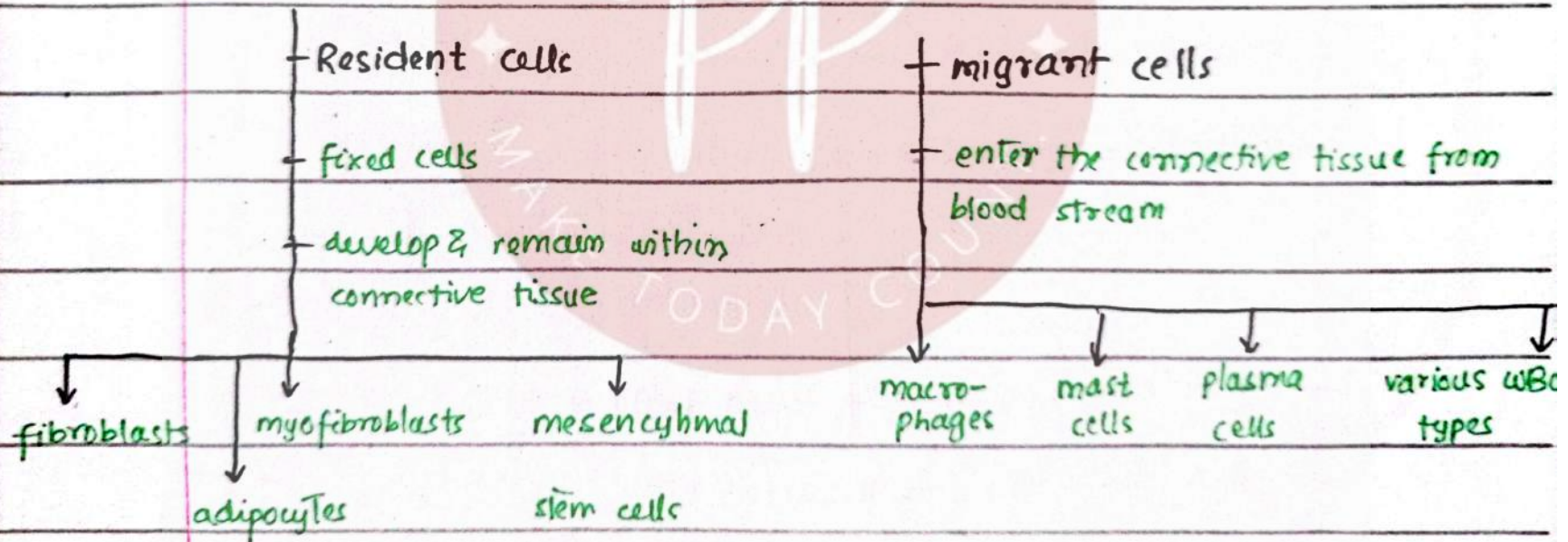


CONNECTIVE TISSUE

Functions :

- structural support
 - medium for exchange
 - Defense & body protection
 - fat storage
- physical barrier
phagocytosis of bacteria
production of Antibodies

Cells :



↓
adipocytes

stem cells

① FIBROBLASTS:

- most abundant

- types: active
inactive

Active

- large, spindle shaped

(large, ovoid, prominent nucleus)

- deeply basophilic

- (↑) amount of RER + free ribosomes

- reside in close proximity to collagen fibres.

Inactive (fibrocytes)

- small ovoid cells
(small, dense rod-shaped nucleus)

- slightly acidophilic
- little/no stain in peripheral cell region

- too thin cell memb.

Function of fibroblast:

- secrete proteins
 - collagen
 - elastin } polymerizes to various connective tissue
- secrete various comp. of ground subs.
 - proteoglycans
 - gps.

② MYOFIBROBLASTS

- not easily distinguished from fibroblasts in ordinary H&E sections under LM.
- contractile apparatus:
 - + in cytoplasm
 - + similar to smooth muscles cells (actin filaments bundles & dense bodies)
- Abundance: areas of wound healing
- chief function: wound contraction

③ MESENCHYMAL STEM CELLS

- loose connective tissue → niches of adult stem cells called "mesenchymal stem cells."
- pericytes:
 - + special cells found around capillaries
 - + have capability to serve as mesenchymal stem cell.
- differentiation ability into:
 - smooth muscle cell
 - fibroblasts
 - adipocytes
 - chondrocytes

such differentiation is stimulated by injury.

④ ADIPOCYTES :

- characterized by presence of fat in cytoplasm → (fat cells)
- adipocytes accumulate in large number → (adipose tissue) - connective tissue

white adipocytes

(fat cells)

- occur singly / in groups
- unilocular (single large fat droplet)
- more abundant
- stores energy (fat)
- single ring appearance
- peripherally displaced flattened nucleus

brown adipocytes

- multilocular (has multiple small fat droplets)
- less abundant
- produces heat (thermogenesis)
- eccentric nucleus

MIGRANT CELLS

1. macrophages

- in blood (monocytes)
- in tissue (macrophages)
- ingest bacteria
- Antigen representing cells (MHC-I)

- types

1. skin epidermic (Langerhan's cells)
2. Brain (microglia)
3. Liver (Kupffer cells)
4. Alveoli (dust cells)
5. Bone (osteocytes)
6. Blood (monocyte)

5. Mast - Cells

- closely associated with blood vessels
- found in skin, resp. & GI tract CT.
- spherical cells with fine, regular basophilic granules.
- Release histamine & vasoactive chemicals when exposed to allergens (causing allergic rxn).

2. Lymphocytes

- most numerous in loose CT of resp. and GI tract.
- produce antibodies and kill virus infected cells.

3. Plasma cells

- derived from lymphocytes
- Antibody production.

4. Neutrophils

- Active phagocytes.

6. Eosinophils

- inc^l after parasitic infect
- phagocytose antigen-anti complexes during allergic rxns.

1. Collagen fibres

Type-I

- most common & very strong.
- ligaments, tendons, bone and skin

Type-II

- elastic & hyaline cartilage
- vitreous body of eye
- provide resistance to pressure

Type-III

- forms meshwork in liver, lymph node, spleen & hemopoietic organs

Type-IV

- found in basal lamina of basement memb.
↓
associated with hemidesmosomes

2. Reticular fibres

- comp. of type-III collagen.
- forms delicate net-like framework in diff. organs.

3. Elastic fibres

- thin, branching fibres that allow stretch
- comp. (microfibrils and elastin protein)
- found in
 - skin
 - lungs
 - gall bladder
 - walls of large blood vessels
- In large blood vessel walls, smooth muscles synthesize elastic fibres.