HISTOLOGY

CONNECTIVE TISSUE

CONNECTIVE TISSUE (C.T.)

Objectives:

By the end of this lecture, the student should be able to:

1.Enumerate the general characteristics of C.T.

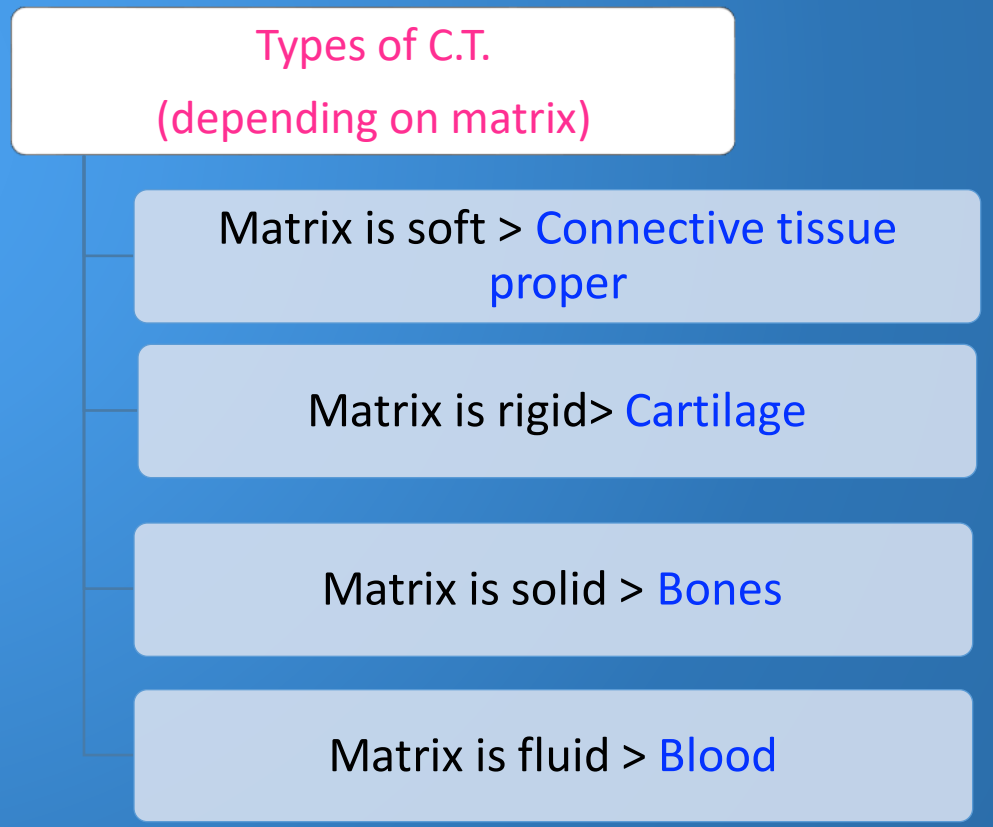
2.Classify C.T into C.T. proper and special types of C.T.

3.Classify C.T. proper (C.T.P.)

4.Describe the structure (components) and distribution of different types of C.T.P.

Connective Tissue

- It is a basic type of tissue, of mesodermal origin, It provides *structural* and *metabolic* support for other tissues and organs. (Jelly like, soft)
- Characteristics:
  - Formed of widely *separated* few cells, with abundant *extracellular matrix*.
  - Most C.T. are *Vascular*.



C.T. Proper Types

Loose (Areolar)

Most common type.

Contains all of C.T.P components in equal amounts.

(No predominant element)

Site :

Subcutaneous tissue (Under skin)

Dense Collagenous

Predominance :

Collagen fibers , fibroblasts

Site:

1-Dense irregular

(dermis, capsule)

2-Dense regular

(tendons, ligaments)

Function:

Resists stretch, tough tissue

Elastic

Predominance:

Elastic fibers (sheet or membrane), fibroblasts

Site:

Large arteries (Aorta)

Function:

Stretchable, elastic tissue

Reticular

Predominance:

reticular fibers + reticular cells (specialized fibroblasts).

Site:

Stroma of organs (liver, spleen ,lymph node)

Function:

Structural support

Adipose

Predominance :

Unilocular fat cells

Site:

1- Subcutaneous

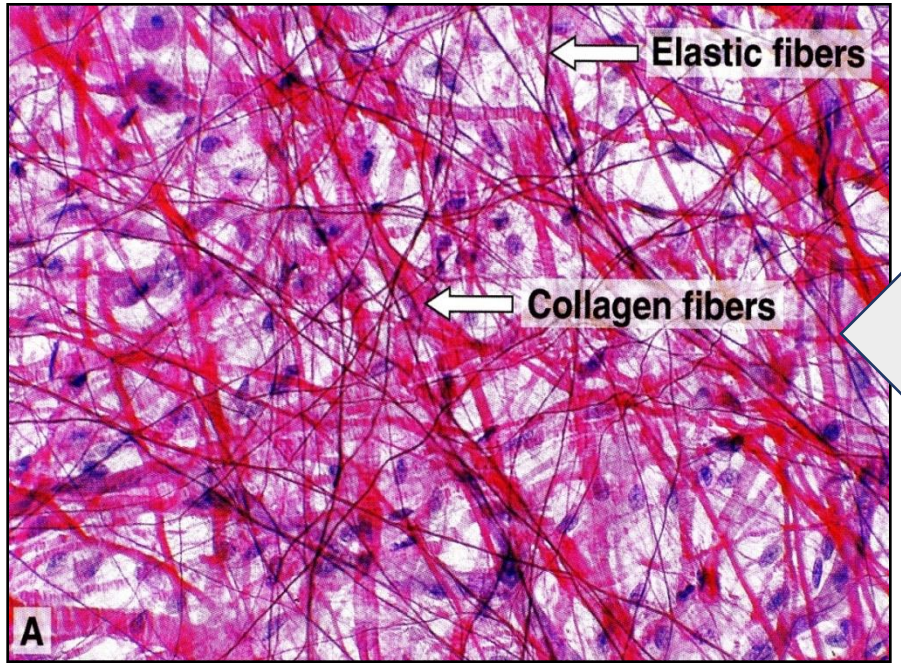
(abdominal wall ,

female breast, buttocks)

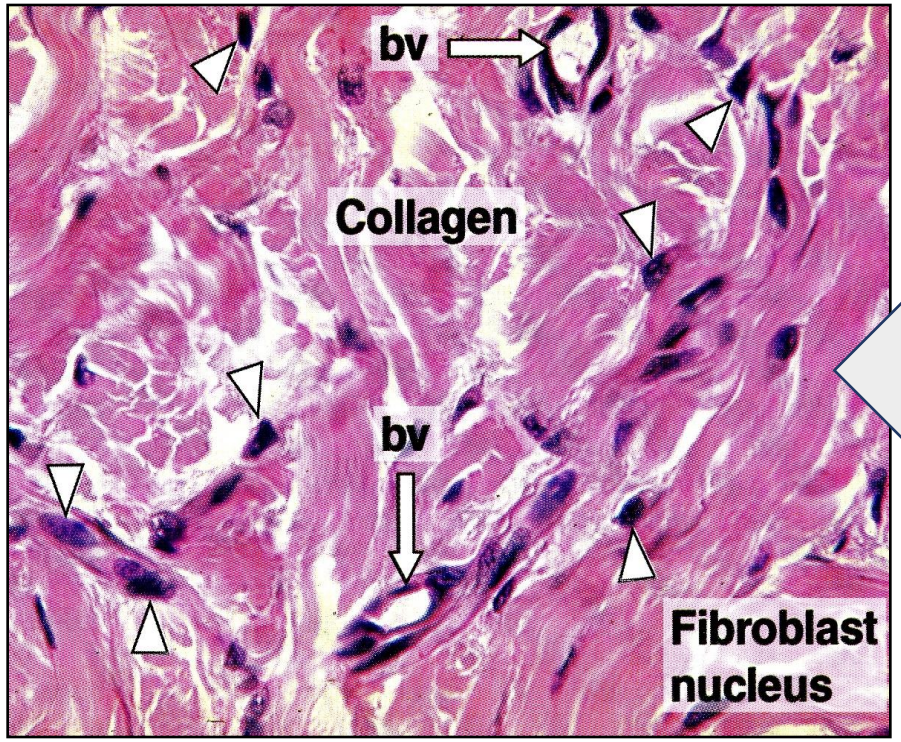
2- Around kidney

Function:

Storage of fat, heat insulation, supports organs (Kidney)

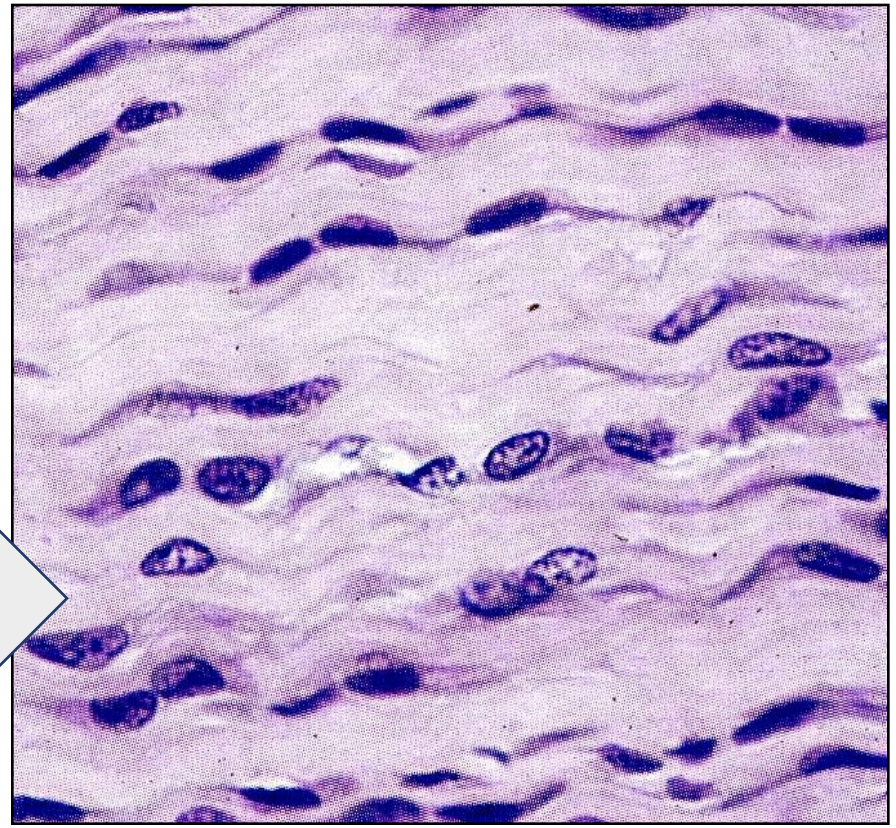


Areolar C.T.



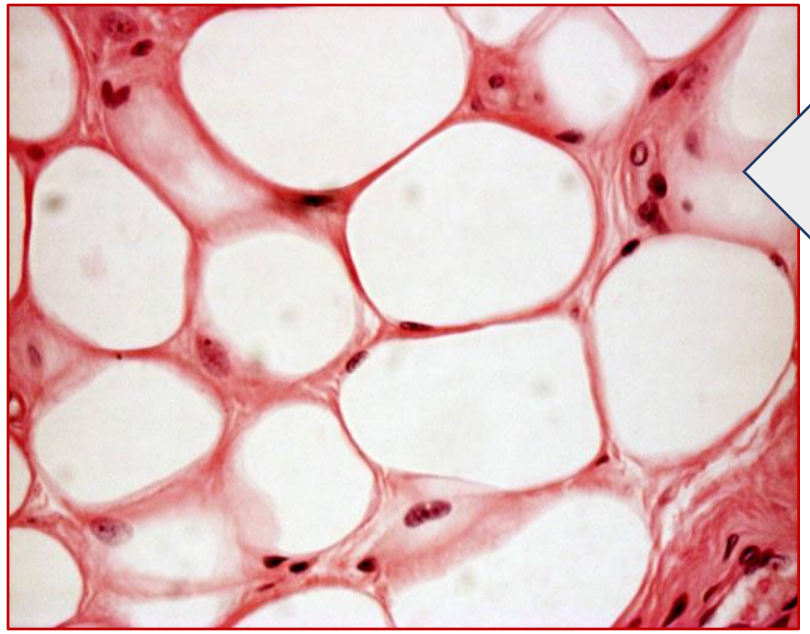
Dense collagenous irregular

Dense collagenous regular



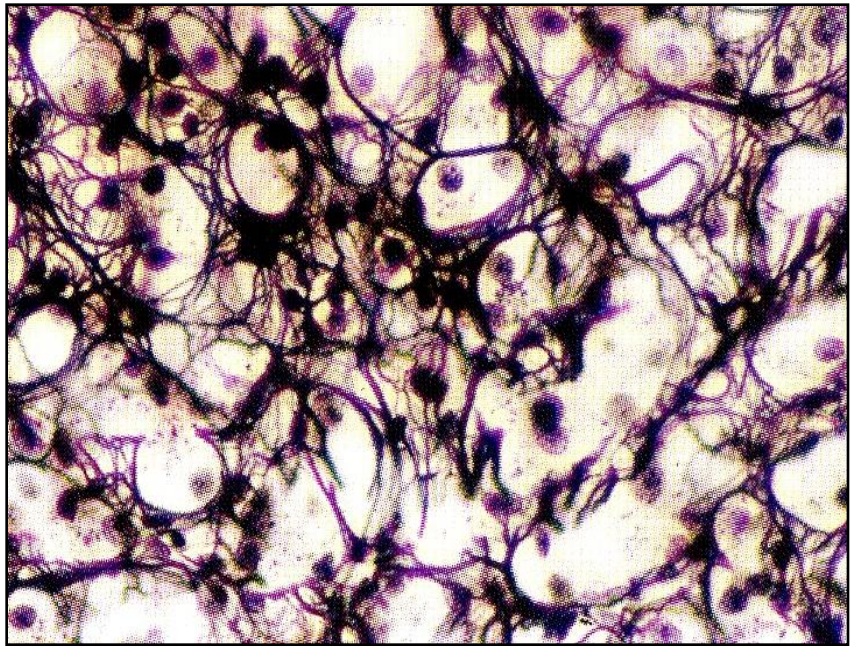
*Note that the dense regular does not have blood vessels (Avascular) unlike dense irregular (Vascular)

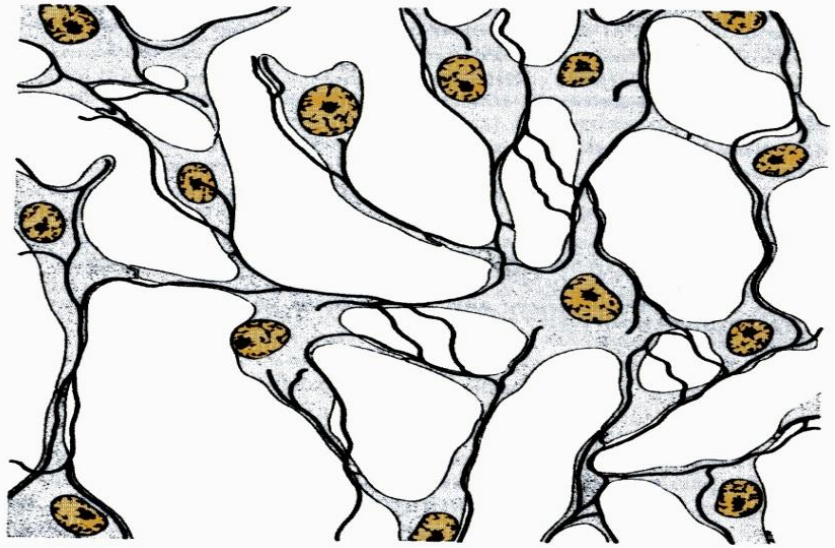
So when we have an injury in our tendon the healing duration is slower comparing to an injury in the dermis (skin).

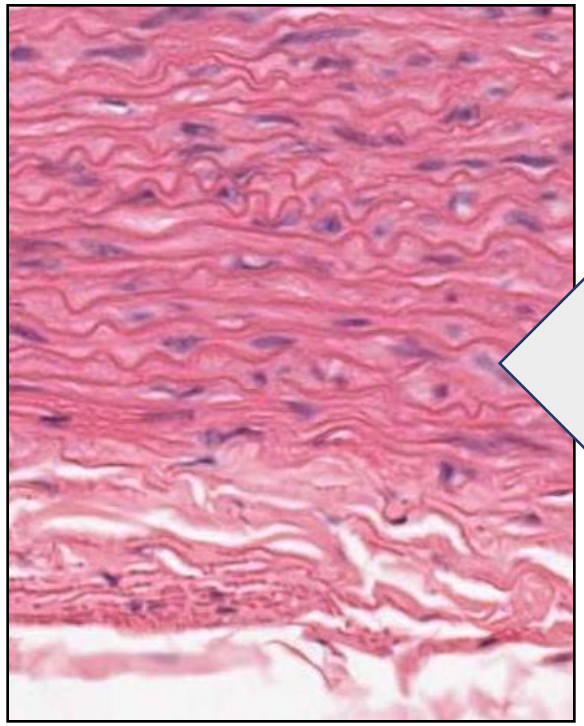


Adipose C.T.

Reticular C.T.



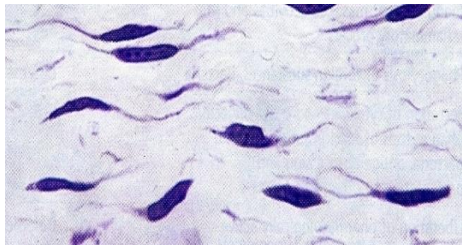


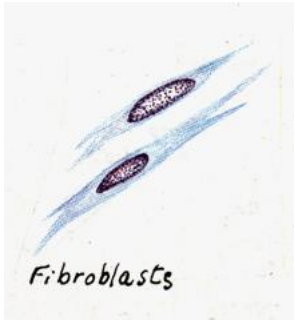


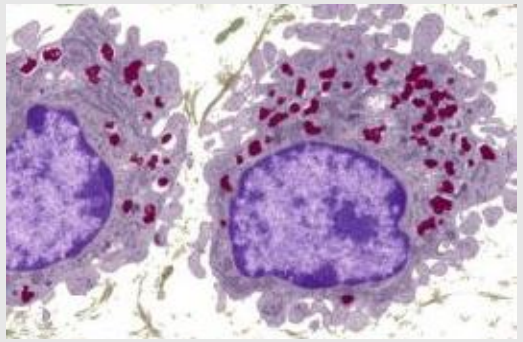
Elastic C.T.

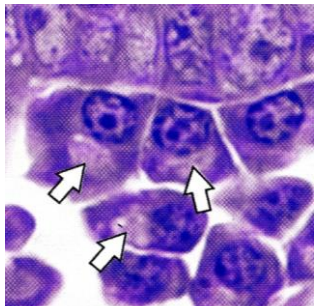
Cells of C.T Proper

NAME	L/M	Function
1) Fibroblasts	○ Most common cell, nearly found in all types of C.T.P. ○ Flat, branched, spindle shaped. ○ Basophilic cytoplasm. ○ Can divide. ○ Old fibroblasts are called Fibrocytes (They're activated during growing and wound healing)	✓ Forms proteins of C.T. fibers. ✓ Forms the C.T. matrix. ✓ Healing of wounds.
2) Macrophages	○ Basophilic cytoplasm that is rich in lysosomes. ○ Irregular outline. (Because of its movement) ○ Can divide. ○ Originate from blood monocytes (WBC)	✓ Phagocytosis.
3) Plasma cells	○ Basophilic cytoplasm with a *negative* Golgi image. ○ Spherical nucleus eccentric with a *clock-face* appearance of chromatin. ○ Derived from B-lymphocytes.	✓ Secretion of antibodies (immunoglobulins).





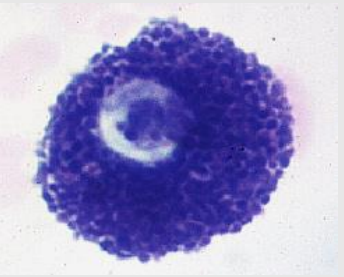


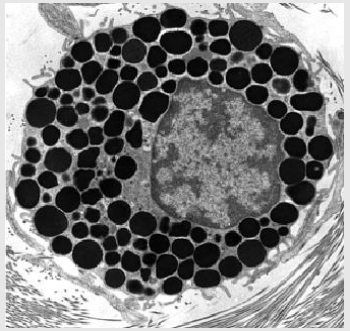


4) Mast cells

- Cytoplasm contains numerous basophilic cytoplasmic granules.

✓ Secretes heparin (anticoagulant).
✓ Secretes histamine (allergic reactions).

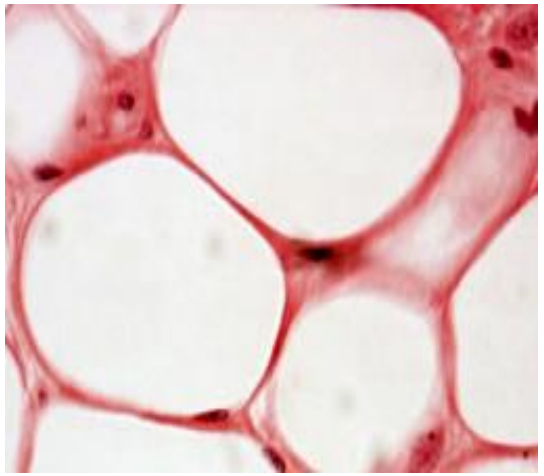




5) Adipose Cells

- Large spherical, with a single large fat droplet.
- Thin rim of cytoplasm at the periphery.
- Nucleus: flattened, peripheral.

✓ Storage of fat.



6) Leucocytes (WBC) for immunity.

Fibers of C.T Proper

- Collagen Fibers (Collagen Type I)
  -*Non Branched*, arranged in bundles (The bundles may branch)
  -Acidophilic
- Reticular Fibers (Collagen Type III)
  -*Branched*, forming a network
  -Stained with *Silver* so it appears *black*
- Elastic Fibers (Elastin)
  -*Branched*
  -Stained with *Orcein* so it appears *brown*

Functions of C.T Proper:

- *Supports* and *connects* *tissues* together and *organs.*
- *Nourishes* the surrounding structures through it's *blood vessels.*
- The cells provide different functions:
  - ✓ Healing injured tissues
  - ✓ Producing Heparin and Histamine
  - ✓ Producing antibodies
  - ✓ Storing Fat
  - ✓ Preserving body temperature
  - ✓ Protection against microorganisms
- The Fibers provide *rigidity or elasticity*.

THANK YOU !

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