Foundation Block | Histology

Connective tissue

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Main text
Important
Female slide
Male slide
DR.Notes
extra

Revised & Reviewed by:
Abdulaziz & Bahammam
Faye Wael Sendi

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Editing File

Objectives :

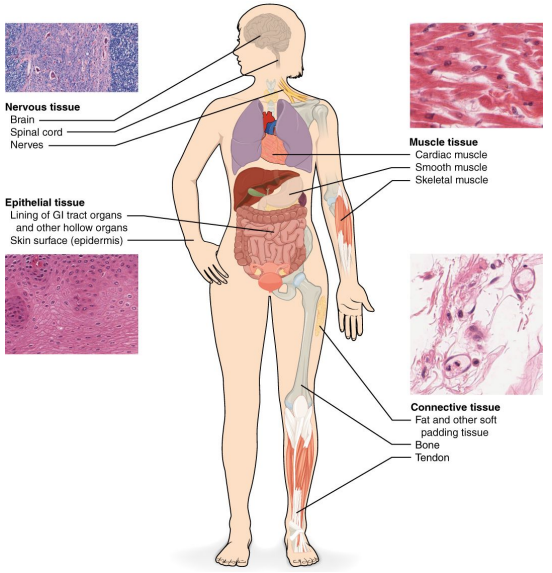
In this lecture you are expected to learn :

- Enumerate the general characteristics of C.T
- Classify C.T into C.T proper (C.T.P) and special types of C.T
- Describe components of C.T.P
- Classify C.T.P and know the distribution and function of each type

Connective tissue C.T

Definition :

- It is one of the 4 basic tissues.
- It is mesodermal in origin. (remember the trilaminar embryonic disc , Embryology)
- Functions :
  - It supports, binds, and connects other tissues and organs
  - provides structural and metabolic support for them.

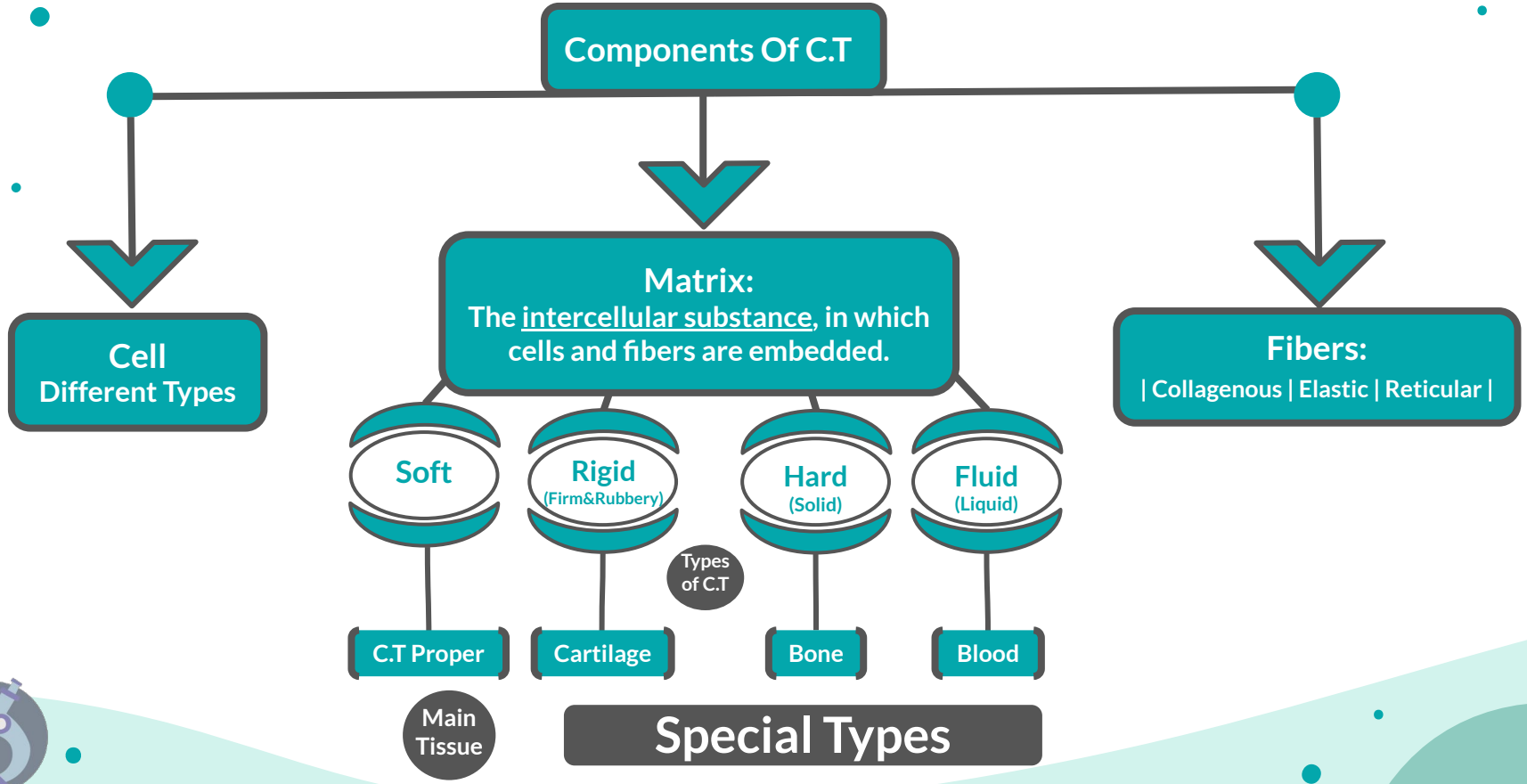


General characteristics of C.T:

- C.T. is formed of widely separated, few cells with abundant extracellular matrix.
- Most C.T. are vascular. (have blood vessel)

  (remember : Epithelial tissue is avascular)

COMPONENTS & TYPES OF CONNECTIVE TISSUE



MED441
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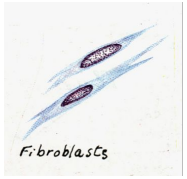
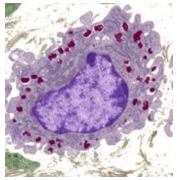
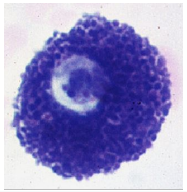
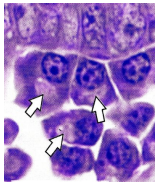
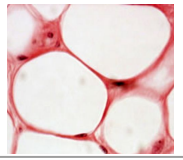
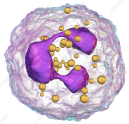
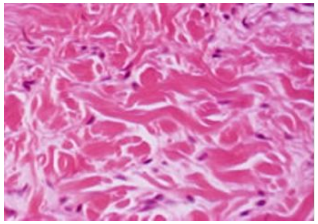
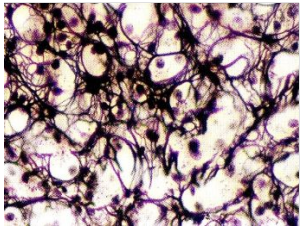
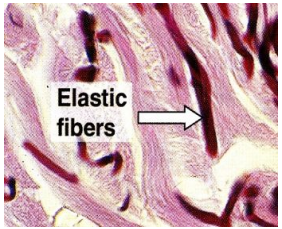
Cells

	Fibroblasts	Macrophages	Mast cells	Plasma cells	Unilocular Adipose cells (Adipocytes, fat cells)	Leucocytes (white blood cells)
						
L/M	• Most common cell, found nearly in all types of C.T. proper. • **Flat branched** cells (spindle-shaped) with **basophilic** cytoplasm. (rich in ribosomes) • They can divide. • old fibroblasts are called fibrocytes .	• **Basophilic** cytoplasm, rich in lysosomes. • Irregular outline. • They can divide. • They originate from blood **monocytes.** Monocytes: a type of white blood cells.	• Cytoplasm contains numerous **basophilic** cytoplasmic granules.	• **Basophilic** cytoplasm with **negative golgi image** (the pale area). • Nucleus: **spherical**, **eccentric** with a clock-face appearance of chromatin. • Derived from B-lymphocytes.	• **Large spherical**, with a single large fat droplet. • Thin rim of cytoplasm at periphery. Rim: حافة • Nucleus: **flattened, peripheral.**	• Appear normally in C.T. proper. • **Neutrophils**: increase in acute inflammation. • **Lymphocytes and monocytes**: increase in chronic inflammation. • **Eosinophils and basophils:** increase in allergic inflammation
FUNCTION	1. Formation of **proteins** of C.T. fibers. 2. Formation of C.T. **matrix** 3. **Healing** of wounds.	• **Phagocytosis.** The ingestion of bacteria or other material	1. Secrete **heparin** (anticoagulant). 2. Secrete **Histamine** (allergic reactions).	• Secretion of **antibodies** (immunoglobulins)	• **Storage of fat.**	

Fibers

Collagen Fibers (Made of collagen type I)	**Reticular Fibers** (made of collagen type III)	**Elastic Fibers** (Made of Elastin)
		
• Non-branched fibers, arranged in bundles. • **Acidophilic**.	• Branched and form a network. • **Stained black** with silver.	• Branched. • **Stained brown** with orcein.

Other important types of **Collagen** include:

- **type II** (in cartilage)
- **type IV** (in basement membrane)

Types of Connective Tissue Proper

The names are after the predominant component

1- Loose (areolar) C.T.

The most common type of C.T. proper.

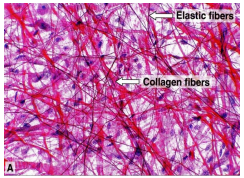
L/M

-Contains all the main components of C.T.P: all types of C.T. cells & fibers + abundant matrix.

-No predominant element in loose C.T.

Site

E.g. Subcutaneous tissue



2- Dense collagenous C.T.

L/M

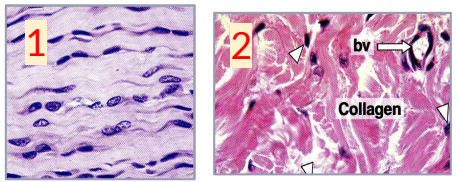
-Predominance of collagen fibers + fibroblasts.

Site

1- Dense regular:
e.g. tendons, ligaments (Avascular)
2-Dense irregular:
e.g . dermis of the skin, capsules

Function

Tough tissue; **resistance to stretch**.



3- Elastic C.T.

L/M

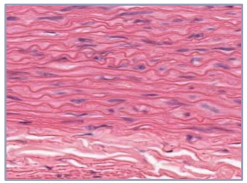
-Predominance of elastic fibers (sheets or membrane) + fibroblasts

Site

Large arteries:
e.g. aorta.

Function

Elastic tissue; **stretchable**



4- Reticular C.T.

L/M

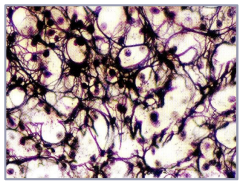
-Predominance of reticular fibers + reticular cells (specialized fibroblasts)

Site

Stroma of organs:
e.g. liver, lymph node, spleen.

Function

Structural support.



5- Unilocular adipose tissue.

(white adipose cells)

L/M

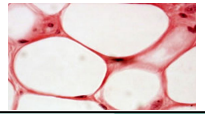
-Predominance of unilocular fat cells.

Site

Subcutaneous tissue, especially in:
-buttocks, abdominal wall, female breast, around the kidney.

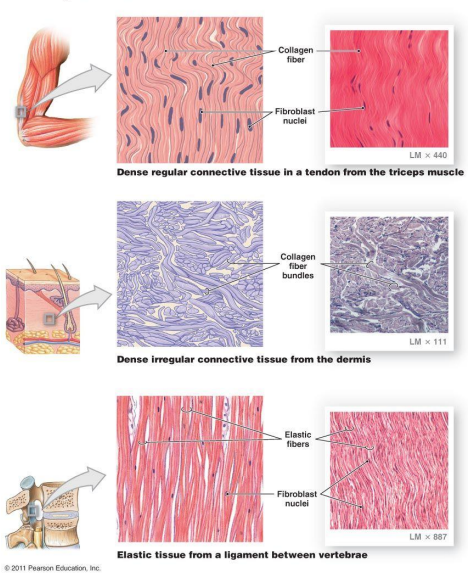
Function

1) **synthesis, storage, release of fat**.
2)**support organs**
Eg.kidney
3)**heat insulation**

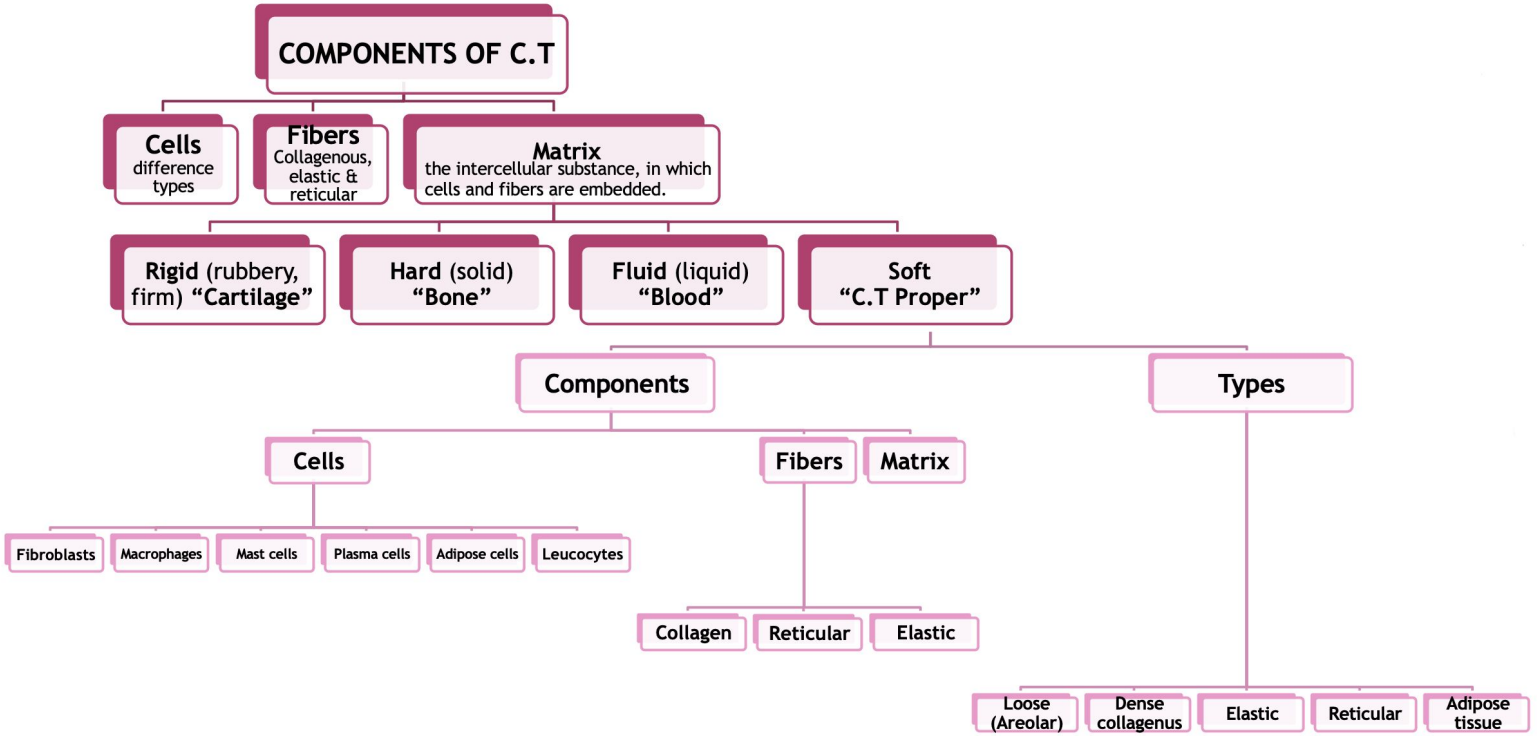


Functions of Connective Tissue Proper:

- Supports, binds and connects other tissues and organs.
- Its **cells** provides **Healing** of injured tissues, **Produce** heparin, histamin & antibodies, **Store** fat & **Preserve** body temperature and **Protect** against microorganisms.
- Nourishes the surrounding structures, through its blood vessels
- Its Fibers provide **Rigidity** or **Elasticity**.



Summary (From 437)



Quiz!

Q(1): The type of matrix in C.T proper?			
A Soft	B Rigid	C Solid	D Fluid
Q(2): Function of plasma cells?			
A Storage of fat	B Secrete antibodies	C Secrete heparin	D Phagocytosis
Q(3): Reticular fibers are made of? (from 437 team)			
A Collagen type I	B Collagen type II	C Collagen type IV	D Collagen type III
Q(4): The predominant component in Elastic tissue is?			
A Fibroblasts	B There is no predominant element	C Elastic fiber	D Both A and C
Q(5): The most common cell in C.T. proper is?			
A Mast cell	B Adipose cell	C Fibroblasts	D Plasma cell
Q(6): Non-branched fibers?			
A Reticular Fibers	B Collagen Fibers	C Fibroblasts	D Elastic Fibers

Answers

1	A
2	B
3	D
4	D
5	C
6	B

Histologyteam441@gmail.com

The Creative Crew!

Foundation Block | Histology Team (441)

Boys Captain

Alwaleed Alnasser

Girls Captain

Norah Alawlah

The Crew

- Abdullah Alqarni
- Abdulrahman Mukhtar
- Abdulmajeed Alharbi
- Mansor Aldoajy
- Mohammed Alhaqbani
- Ziyad Al-Abduljabbar

- Iyah Alhasan
- Hussah Alshareef
- Lubna Altamimi
- Zahraa Alsultan
- Fay Alluhaidan
- Sarah Al-homaydy
- Sarah Al-Majed