

كلية
المستقبل الجامعة

قسم الصيدلة



Human biology

Lab 3: Connective Tissue

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Connective tissue

- **Consists** of two basic elements: **Cells** and **Fibers**

□ **Functions:**

- Provides substance and form to the body and organs.
- Bind and support other tissues.
- Defends against infection.
- Aids in injury repair.
- Stores lipids.
- Provides a medium for diffusion of nutrients and wastes.
- Attaches muscle to bone and bone to bone.

True Connective Tissue Cells

Fibroblasts: Secrete both fibers and ground substance of the matrix (wandering)

Macrophages: Phagocytes cell that develop from Monocytes (wandering or fixed)

Plasma Cells: Antibody secreting cells that develop from B Lymphocytes (wandering)

Mast Cells: Produce histamine that help dilate small blood vessels in reaction to injury (wandering)

Adipocytes: Fat cells that store triglycerides, support, protect and insulate (fixed)

Fibers: there are three

Collagen Fibers: Large fibers made of the protein collagen and are typically the most abundant fibers. Promote tissue flexibility, it keeps the muscle from tearing away from the bone.

Elastic Fibers: Intermediate fibers made of the protein elastin. Branching fibers that allow for stretch and recoil

Reticular Fibers: Small delicate, branched fibers that have same chemical composition of collagen. Forms structural framework for organs such as spleen, liver and lymph nodes.



TYPES OF CONNECTIVE TISSUE

1. True Connective Tissue

- a. Loose Connective Tissue**
- b. Dense Connective Tissue**

2. Supportive Connective Tissue

- a. Cartilage**
- b. Bone**

3. Liquid Connective Tissue

- a. Blood**
- b. lymph**



True or Proper Connective Tissue

1. Loose Connective Tissue:

a. Areolar connective tissue

Widely distributed under epithelia

b. Adipose tissue

Hypodermis, within abdomen, breasts

c. Reticular connective tissue

Lymphoid organs such as lymph nodes

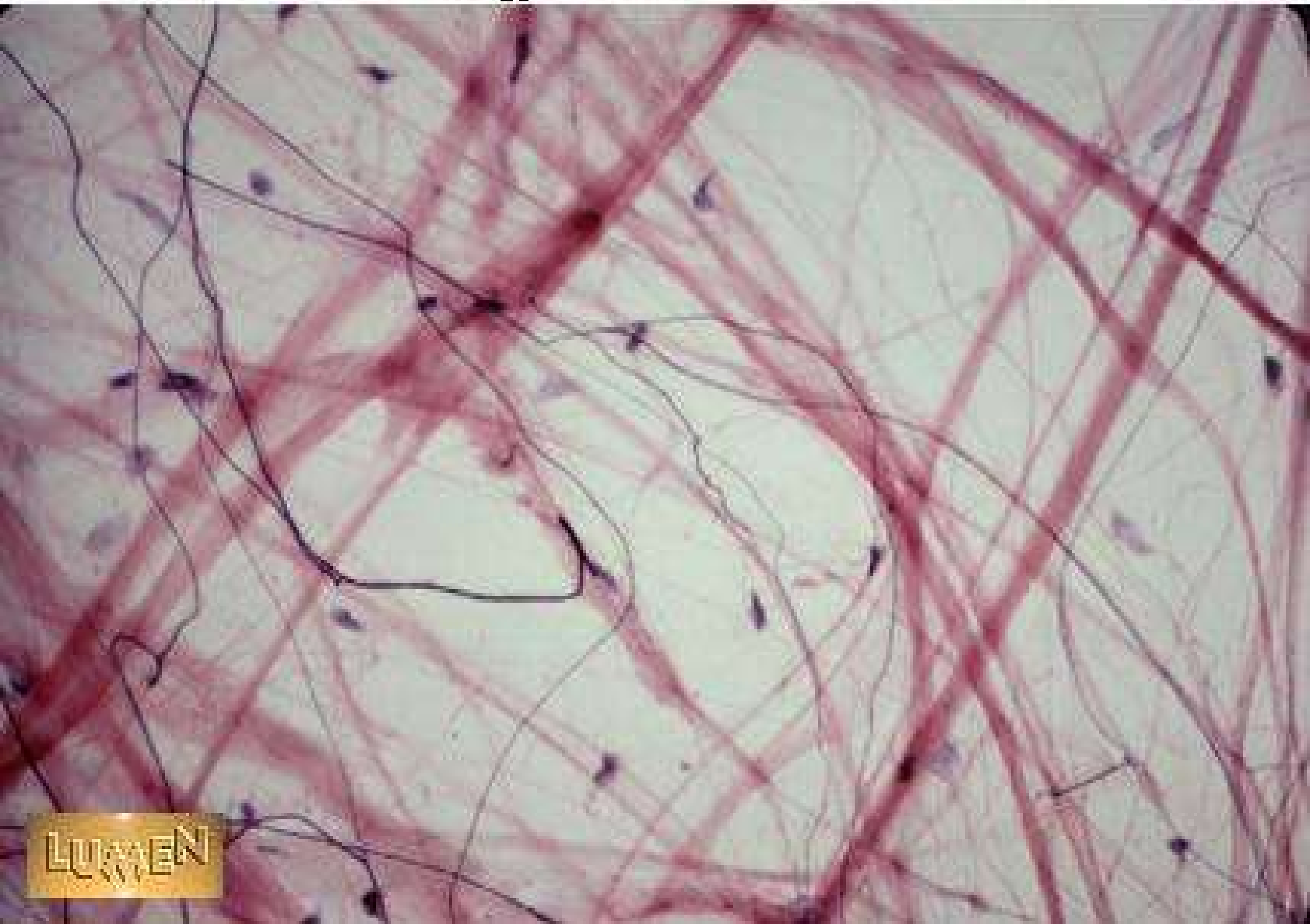


Loose Connective Tissue:

1- Areolar Connective tissue:

- Consists of all 3 types of fibers, several types of cells, and semi-fluid ground substance**
- Found in subcutaneous layer and mucous membranes, and around blood vessels, nerves and organs**
- Function = strength, support and elasticity, it binds epithelia to underlying tissues and holding organs in place.**

Histology Lab Part 3: Slide 8



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Loose Connective Tissue:

2- Adipose tissue: it is specialized form of loose C. T.

- Consists of adipocytes, each adipose cell contains a large fat vacuole or droplet. They store energy in the form of triglycerides (lipids).**
- Found in subcutaneous layer, around organs and in the yellow marrow of long bones**
- Function = supports, protects and insulates, and serves as an energy reserve**

Histology Lab Part 3: Slide 11



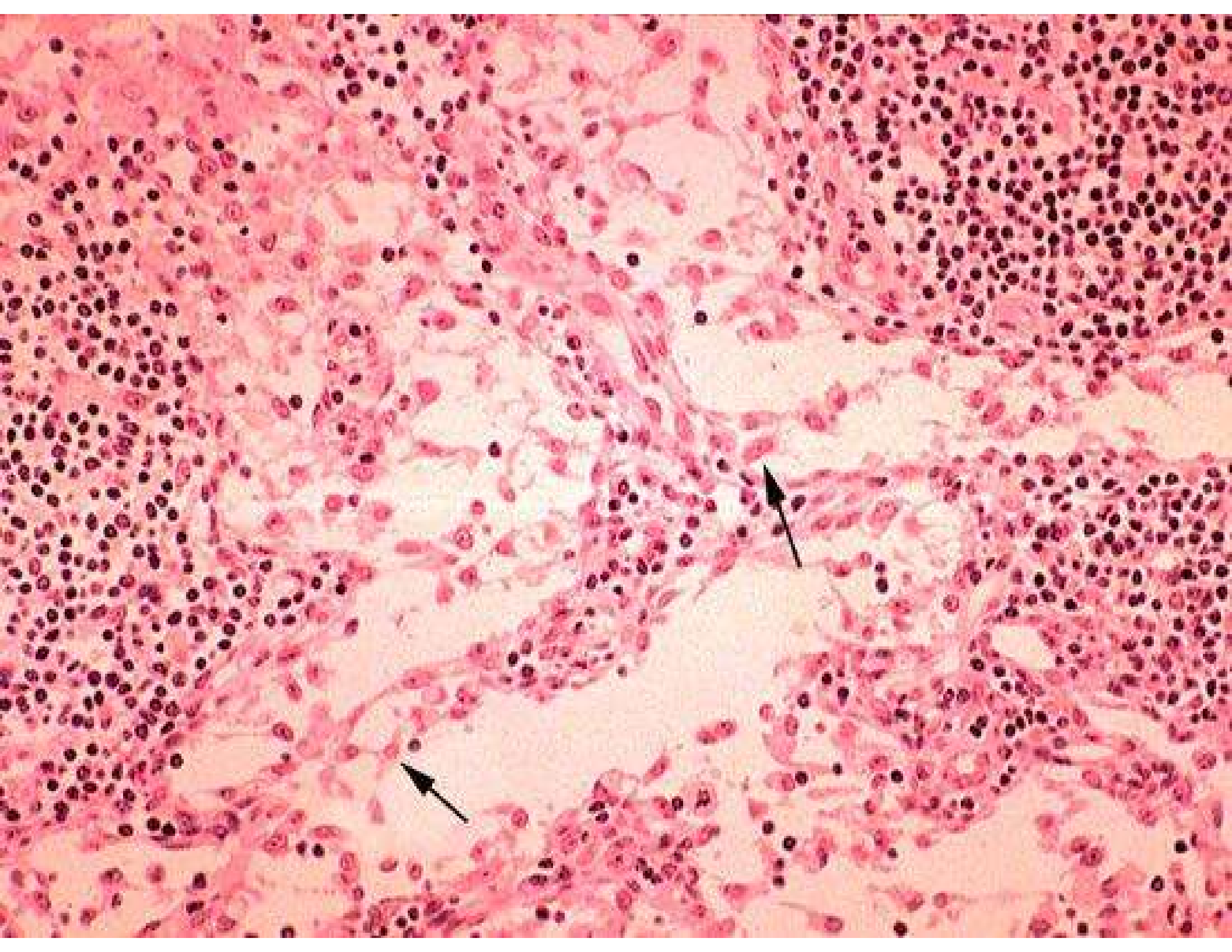
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Loose Connective Tissue:

3- Reticular connective tissue:

- Consists of fine interlacing reticular fibers and reticular cells**
- Found in liver, spleen and lymph nodes**
- Function = forms the framework (stroma) of organs and binds together smooth muscle tissue cells**





True or Proper Connective Tissue

2- Dense Connective Tissue:

Contains more numerous and thicker fibers and far fewer cells than loose C.T.

a. Dense regular connective tissue

Tendons and ligaments

b. Dense irregular connective tissue

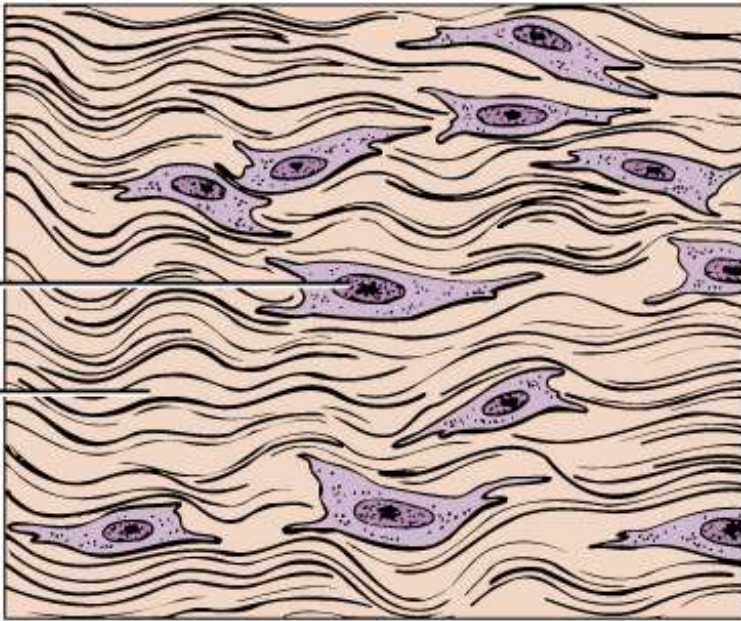
Dermis of skin, submucosa of digestive tract



Dense Connective Tissue:

1- Dense regular Connective Tissue

- Consists of bundles of collagen fibers and fibroblasts
- Forms tendons, ligaments and aponeuroses
- Function = provide strong attachment between various structures

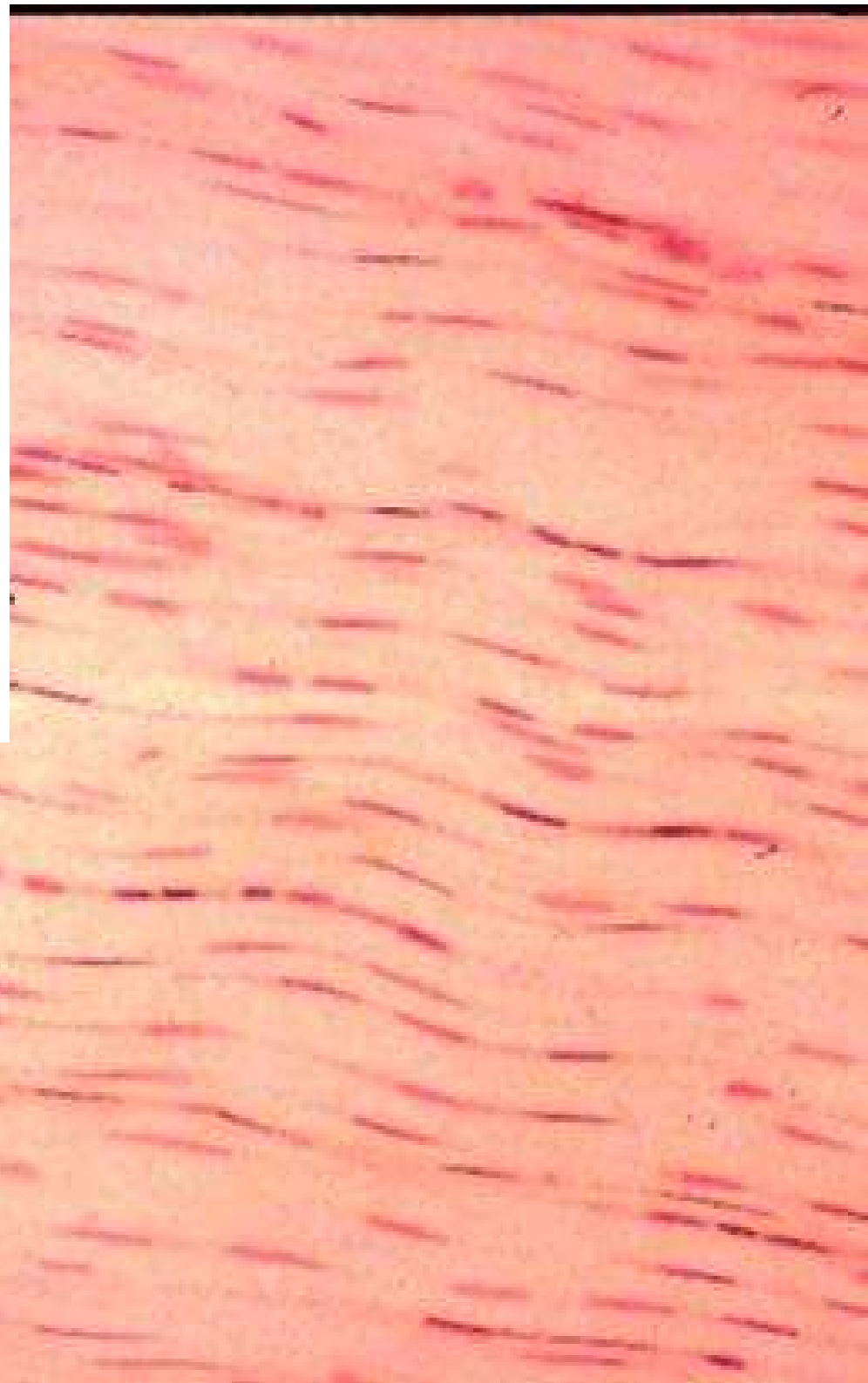


Nucleus of fibroblast

Collagen fiber

Dense regular connective tissue

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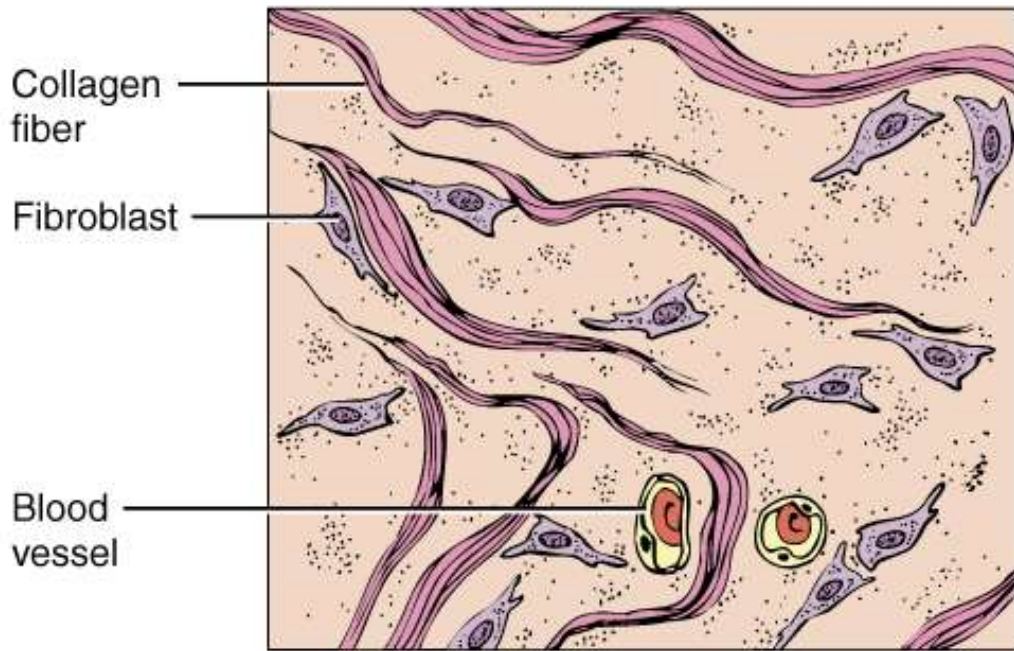




Dense Connective Tissue:

2- Dense Irregular Connective Tissue:

- Consists of randomly-arranged collagen fibers and a few fibroblasts
- Found in fasciae, dermis of skin, joint capsules, and heart valves
- Function = provide strength



Dense irregular connective tissue

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