

**Connective Tissue Proper- Part 1**  
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**The main function of (C.T) is maintaining form of the body.**

**-Functioning in a mechanical role; its provide a matrix that connects and binds cells with organs and gives support to the body.**

**1-Binding and Support.**

**2-Protection.**

**3-Movement.**

**4-Immune Defense.**

**5-Energy storage.**

**6- Mineral Storage.7- Heat Production.8-Transport.**

**Connective tissue is formed by three classes of components, cells, fibers and ground substance.**

**The greatest part of C.T is an intercellular material, which can be fluid a in the case of blood or hard (bone), which are responsible for the remarkable structural, functional and pathological diversity of C.T.**

## Connective Tissue Classification

Common origin (mesenchyme)

Connective tissue proper

Loose connective tissue (fewer fibers, more ground substance)

1. Areolar
2. Adipose
3. Reticular

Dense connective tissue (more fibers, less ground substance)

1. Regular
2. Irregular
3. Elastic

Supporting connective tissue

Cartilage (semisolid matrix)

1. Hyaline
2. Fibrocartilage
3. Elastic

Bone (solid matrix)

1. Compact
2. Spongy

Fluid connective tissue

Blood

## **1. Loose (areolar) connective tissue:**

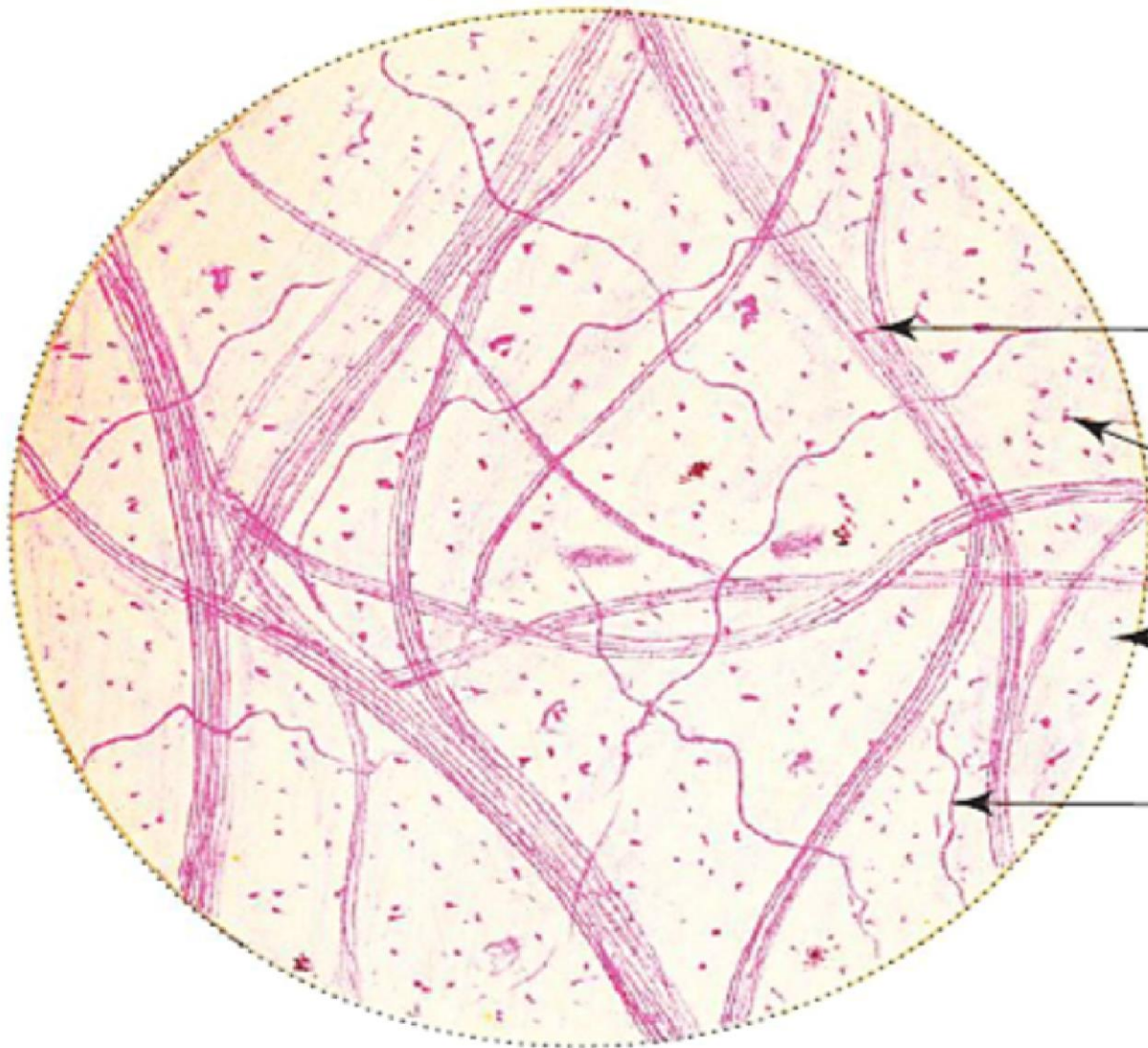
**It is a vascular, delicate, flexible connective tissue, where the fibers are loosely arranged. It serves as a packing material by filling spaces between various tissue components of an organ and giving it a shape, e.g. subperitoneal tissue, endomysium, lamina propria.**

### **General Microscopical features :**

**(i) Few loosely arranged collagen and elastic fibers.**

**(ii) large number of connective tissue cells (fibroblasts, fibrocytes, mast cells, etc.).**

**(iii) large amount of ground substance.**



Collagen Fibres

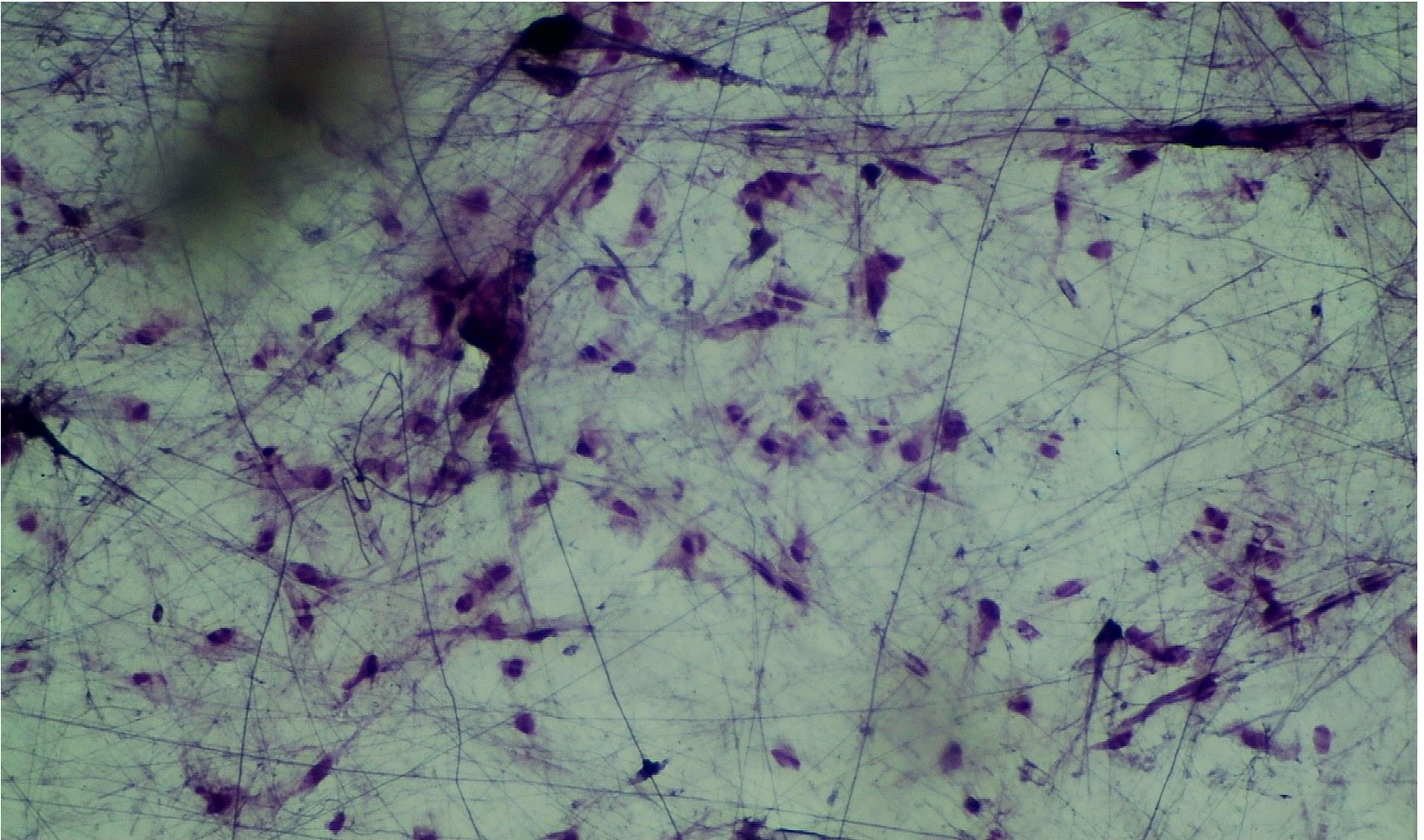
Fibroblasts

Ground Substance

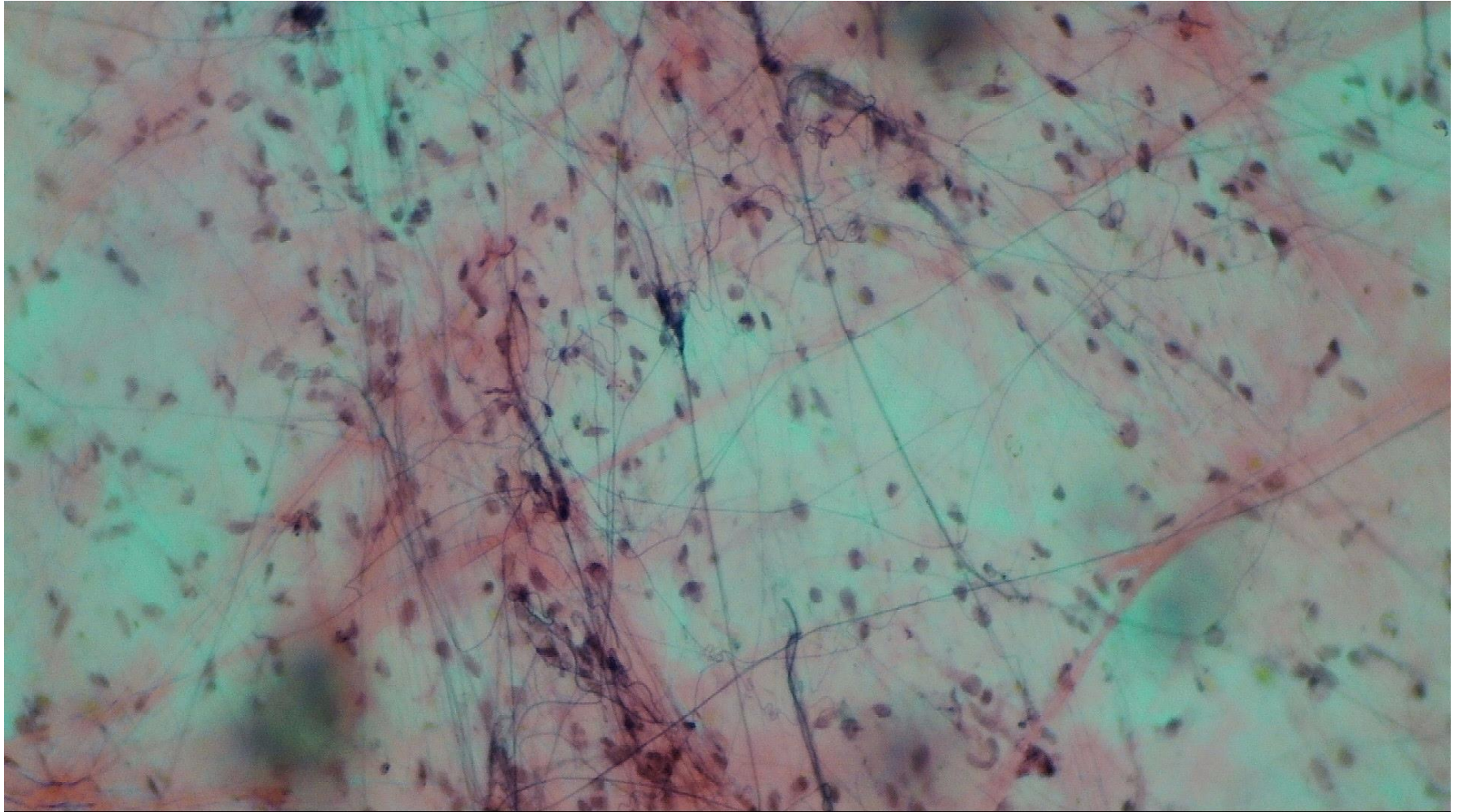
Elastic Fibre

**Loose areolar connective tissue**

## Loose Areolar Connective Tissue



## Loose Areolar Connective Tissue

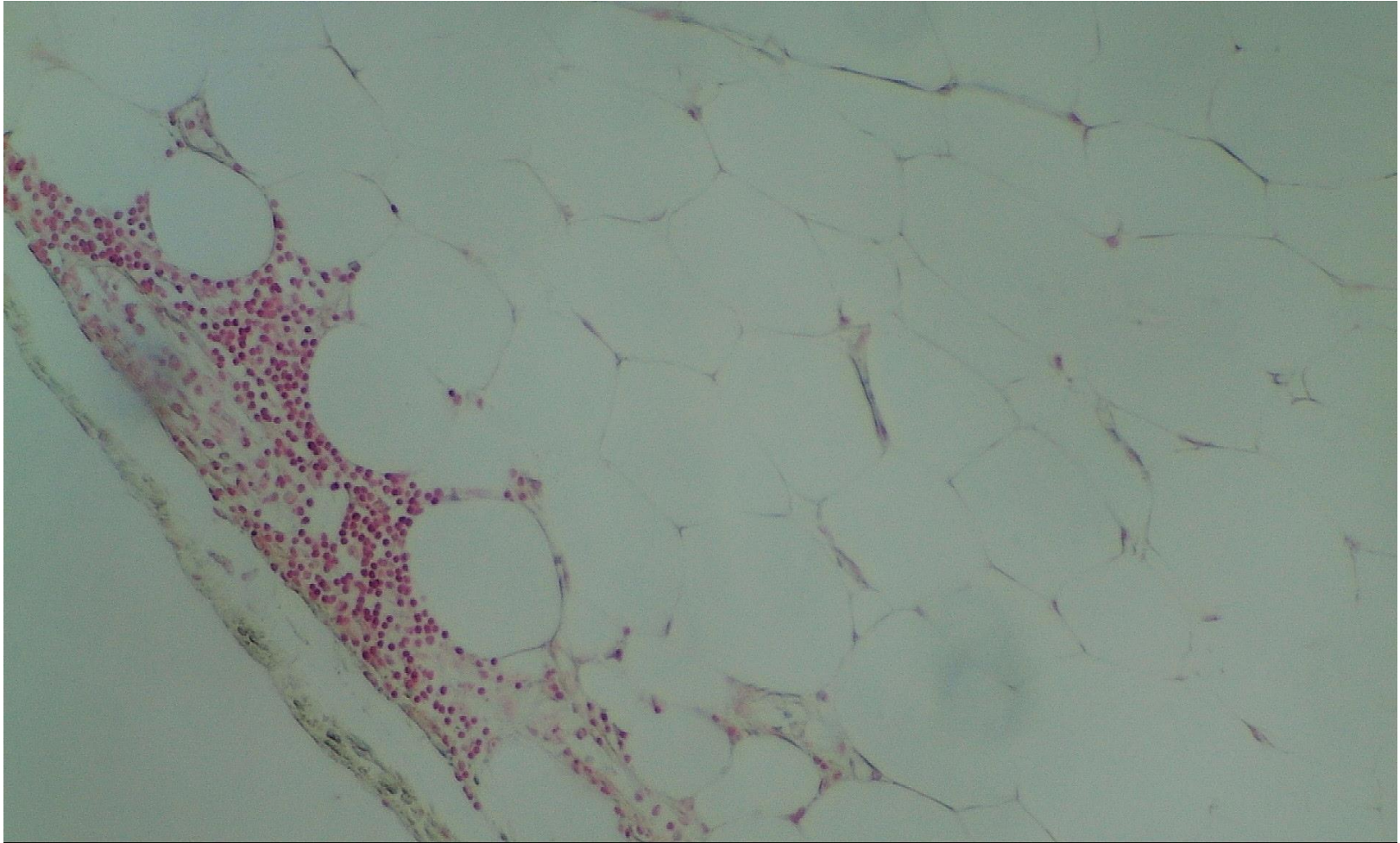


## **Loose Adipose Connective Tissue**

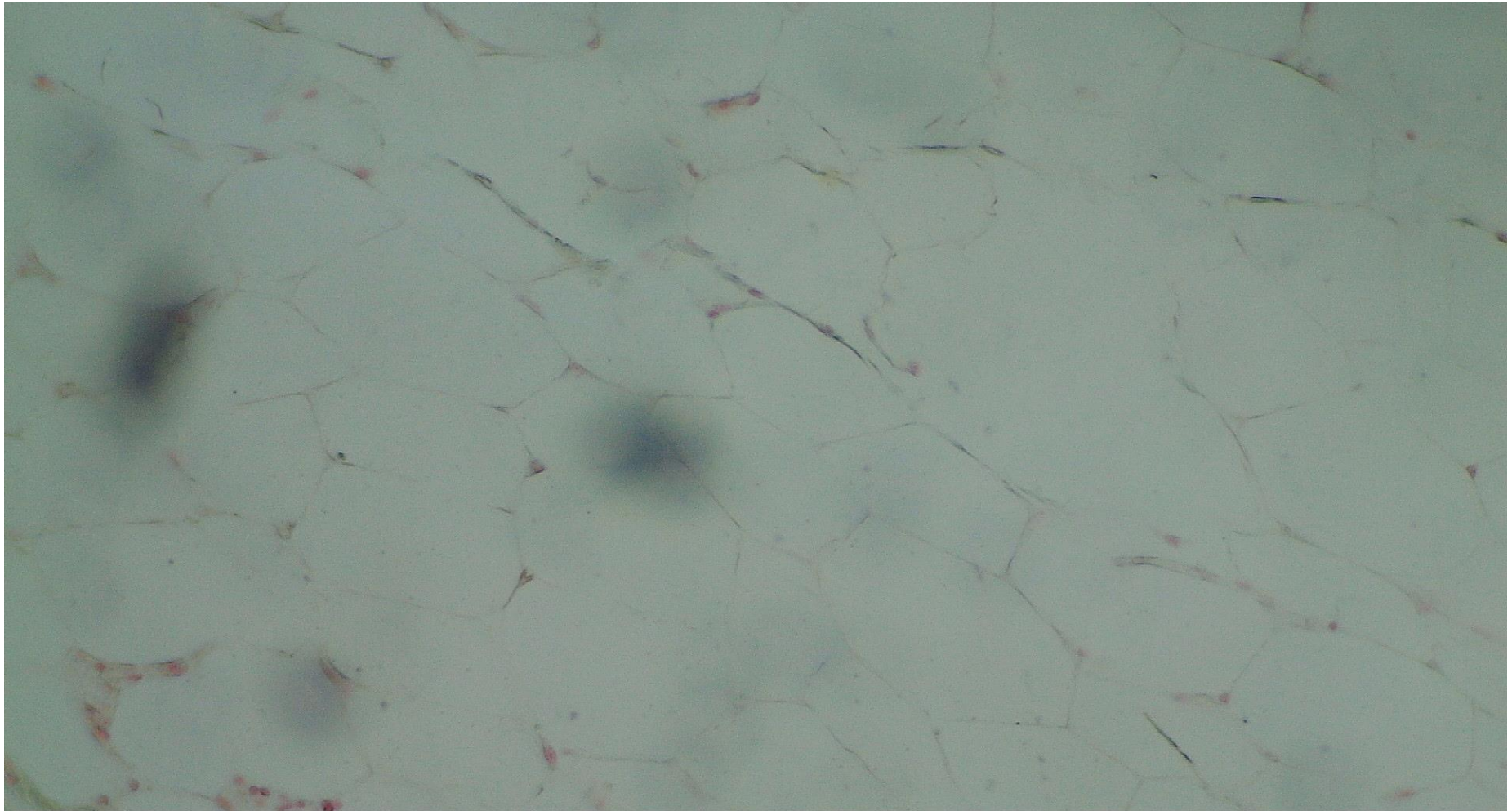
Connective tissue such as **adipose** (*fat*) **tissue** serves as a **storage site for lipids** (*fats & oils*), surrounds and protects internal organs, and provides an insulating layer to aid in body temperature regulation.



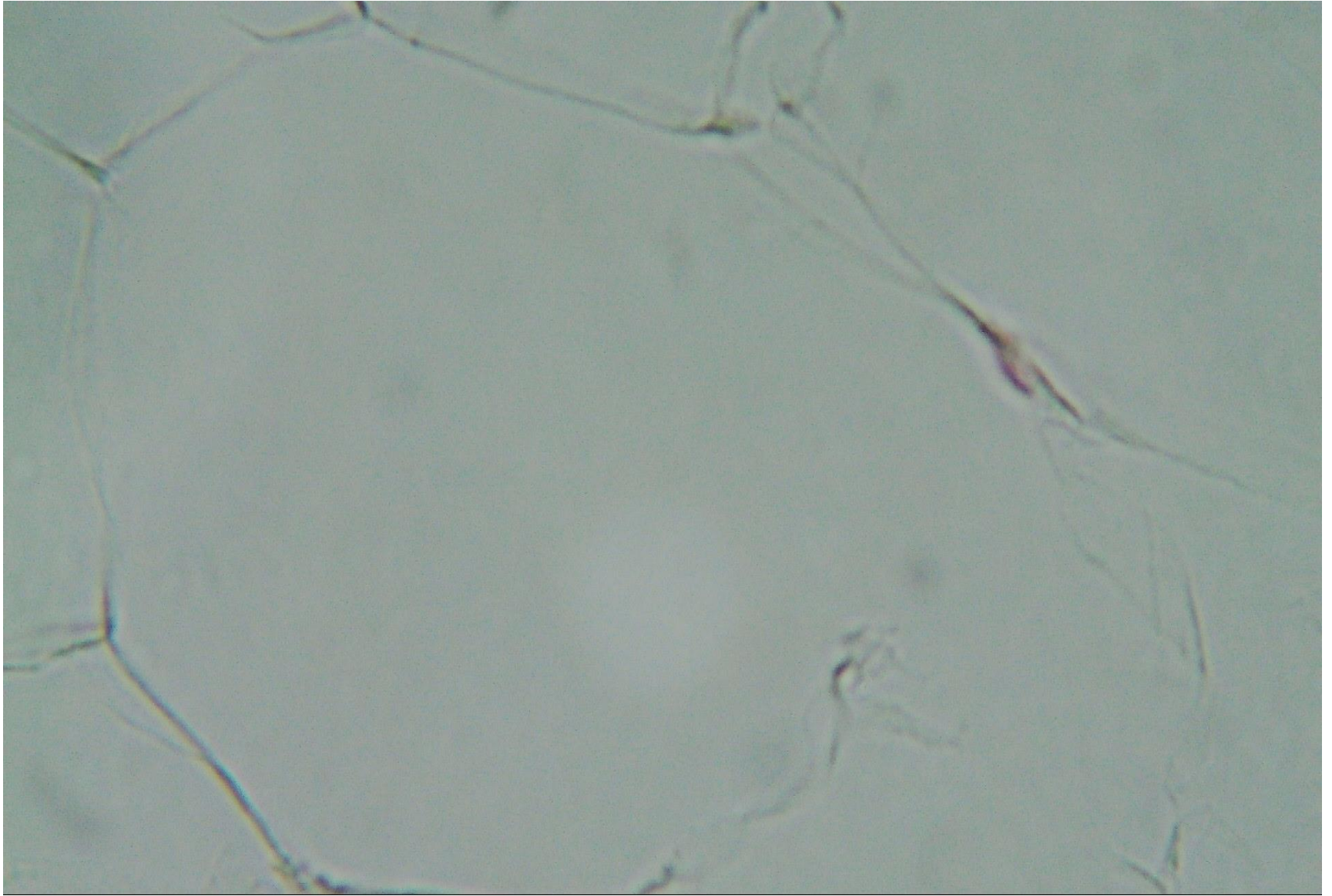
# Loose (Adipose) Connective Tissue (4x)



# Loose (Adipose) Connective Tissue (10x)

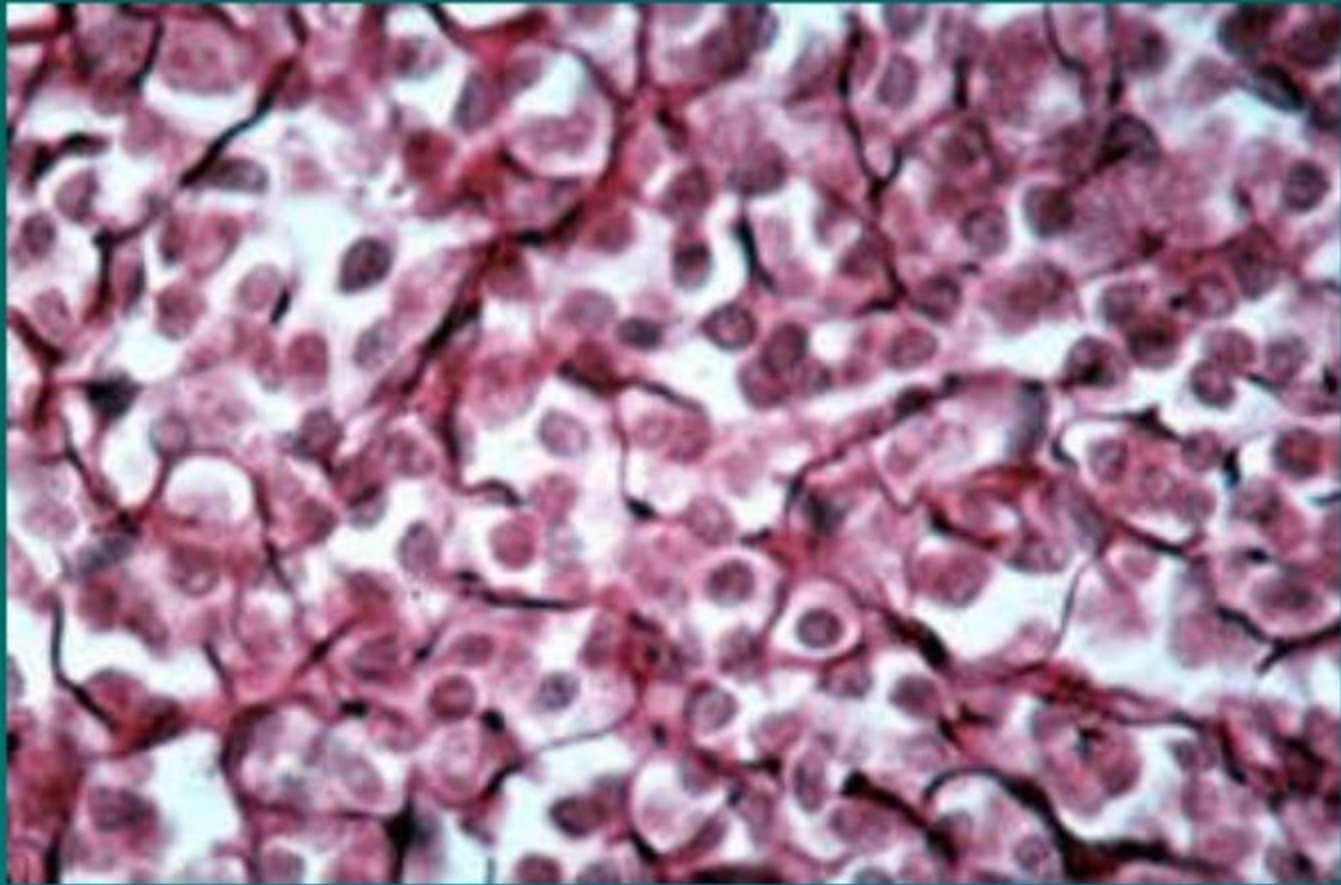


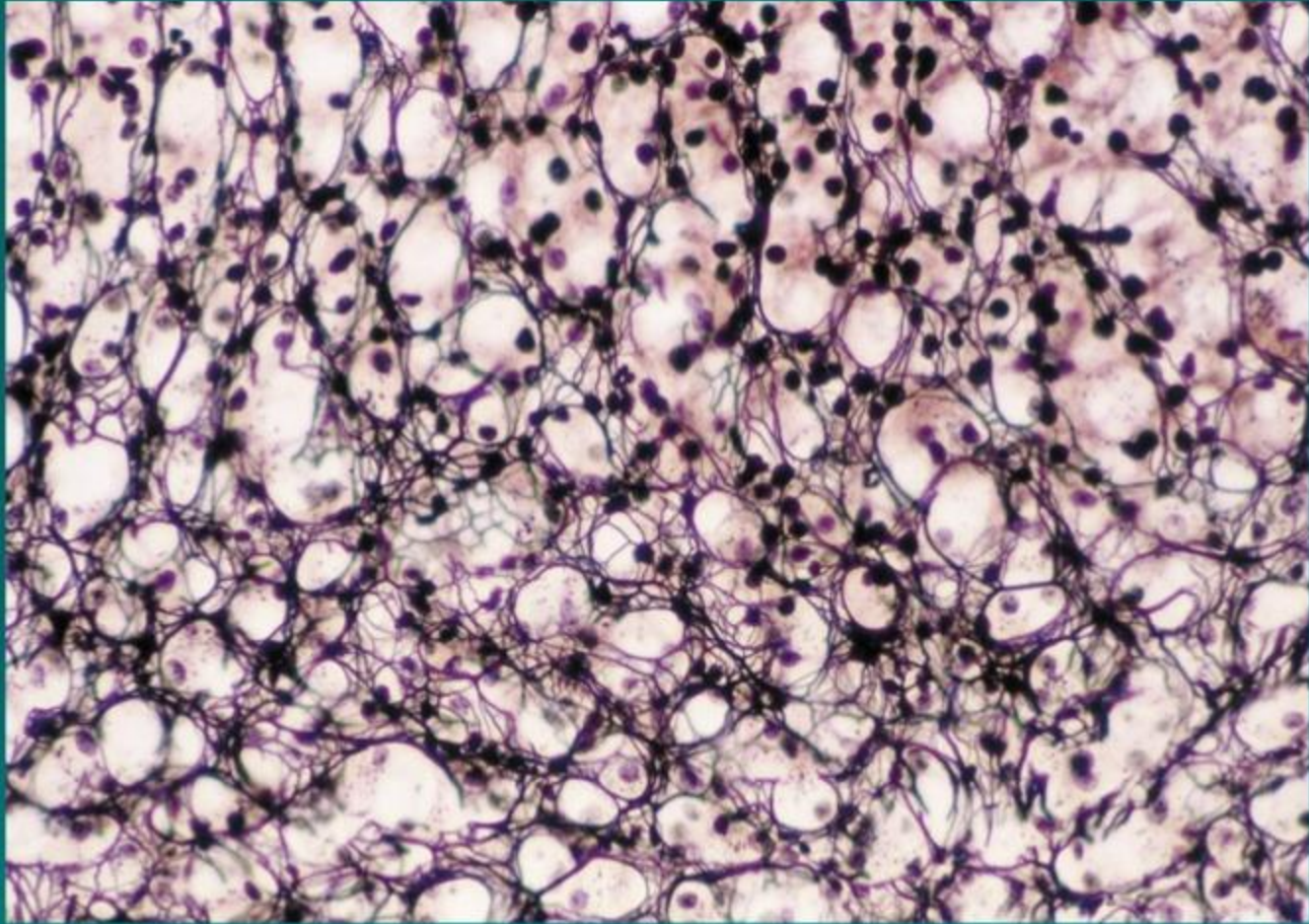
# Loose (Adipose) Connective Tissue (40x)



## **Loose (Reticular) Connective Tissue**

**Reticular fibers are thin and form a delicate net-like frame network in the liver, lymph nodes, spleen, hemopoietic organs and other organs with function to filter blood and lymph. Reticular fibers also support capillaries , nerves and muscle cells .**





# Dense connective tissue

- Dense connective tissue consists of densely packed fibers with relatively little space between the fibers.
- Has proportionately high protein fiber than ground substance.
- Also called collagenous connective tissue because of abundance of collagen fibers.
- Further divided into three categories.
  - Dense regular connective tissue
  - Dense irregular connective tissue
  - Elastic connective tissue.

## Dense regular connective tissue

- Has densely packed collagen fibers in the extracellular matrix that are oriented predominantly in one direction which resist stretching and give strength in direction of orientation
- Dense regular connective tissue occurs where strong, flexible support is needed
- Make structures such as tendons, which connect muscles to bones , and most ligaments, which connect bones to bones





(b)



Fibroblast

Collagenous  
fibers

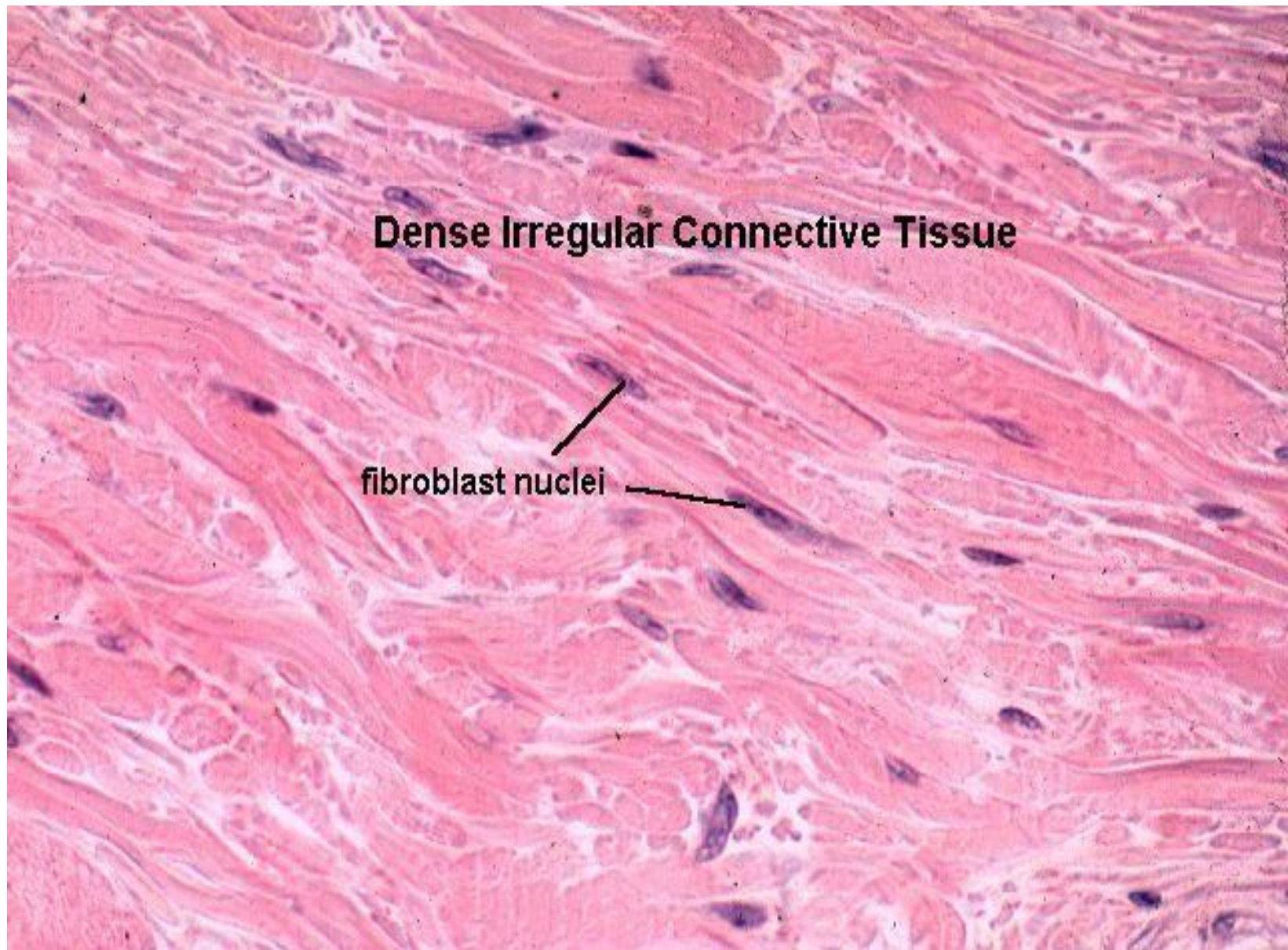
(c)

## Dense Irregular connective tissue

- Dense irregular connective tissue is characterized by large amounts of densely packed collagenous fibers that extend in all directions and are interwoven to provide tensile strength in any direction
- The components of dense irregular c.t are same as that of dense regular c.t they differ in arrangement. The multidirectional interwoven framework of collagen fiber offer tensile strength in all directions
- bundles of collagen fibers appear in clumps throughout the tissue, rather than arranged in parallel as seen in dense regular
- found in the dermis of the skin and the submucosa of the GI tract.

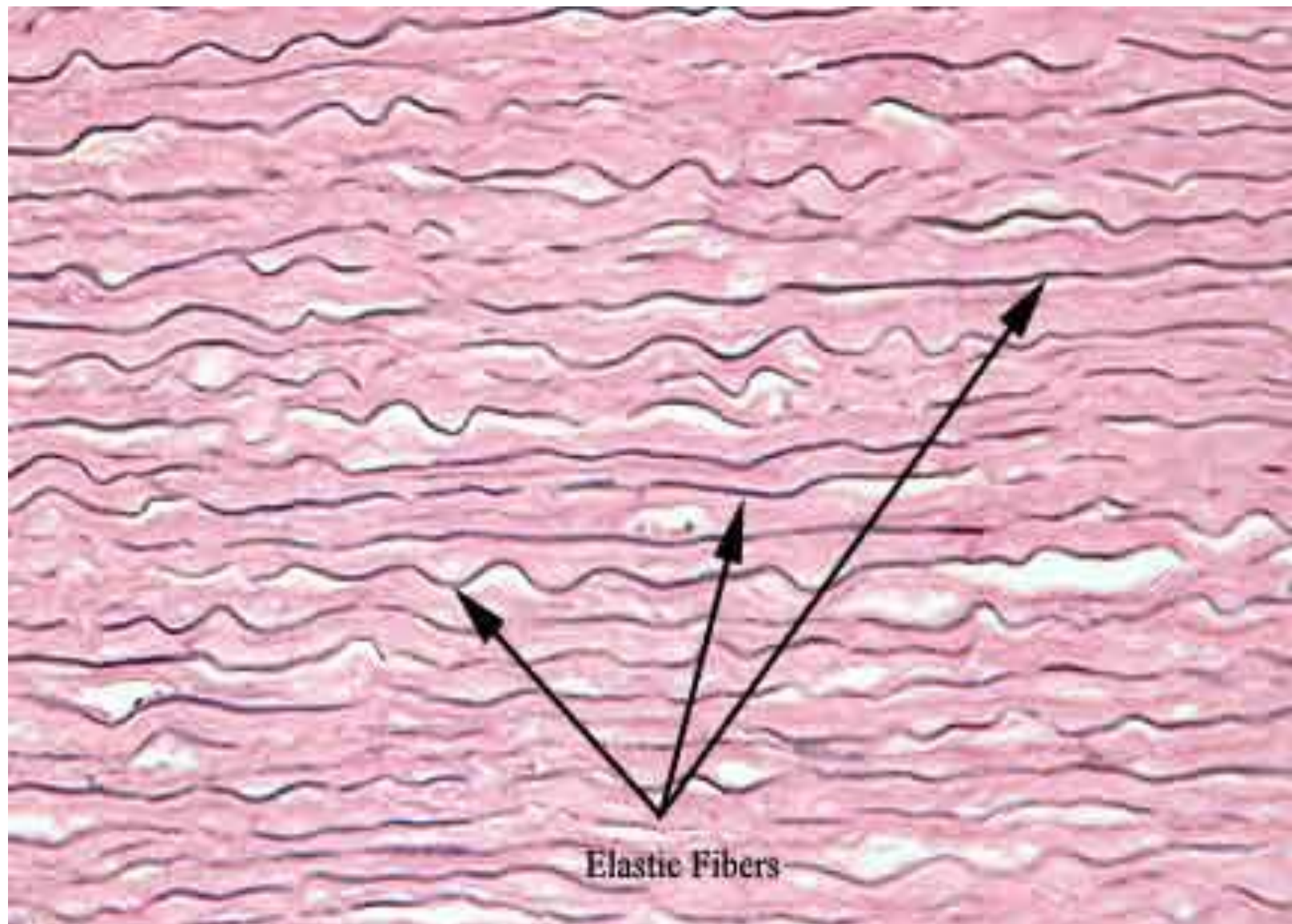
**Dense Irregular Connective Tissue**

fibroblast nuclei



## Elastic connective tissue

- Elastic connective tissue is composed primarily of elastic fibers that are irregularly arranged and yellowish in color .
- They can be stretched to one and a half times their original lengths and will snap back to their former size.
- Elastic connective tissue is found in the walls of large arteries, in the vocal cords, and in the trachea and bronchial tubes of the lungs.



## The Practical slides (as you see under Microscope)

