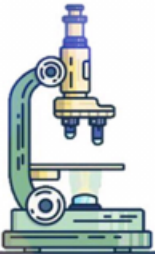




# Practical Histology

## OSPE

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# Notes For The Exam :

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- 1- First Lecturer will be as Pictures, the rest will be Microscope .
- 2- Is not allowed to write Abbreviations, You must write a full name .
- 3- Pictures that found with microscope are just for clarification .
- 4- We prefer that you read the lectures ( Especially Lecture 4 ) .
- 5- 2 Stations for Histology on the exam .



# CELL STRUCTURE

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# Nucleus

## Q1- Identify the structure :

Nucleus

## Q2- Location of :

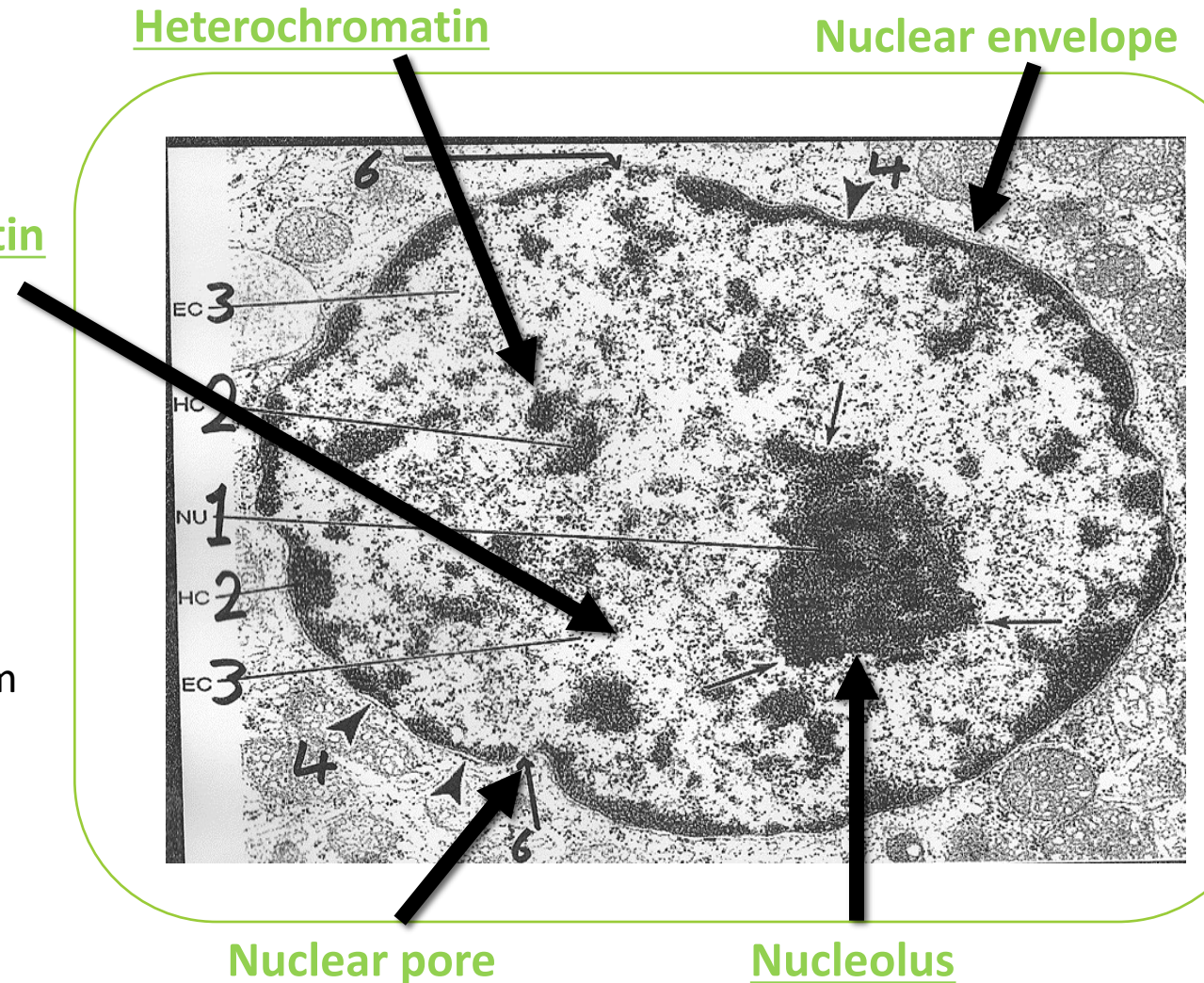
- **Heterochromatin** ( dark and inactive )
- **Euchromatin** ( pale and active )
- **Nuclear pore** ( openings in the nuclear envelope )
- **Nuclear envelope** (lining the nucleus)
- **Nucleolus** ( The biggest dark region in the nucleus)

## Q3- What is the function of **Nucleolus** ?

formation of ribosomal RNA (rRNA),  
which is responsible for protein synthesis in the cytoplasm

## Q4- what is the function of the **Nucleus**?

- It is the site of formation of the three types of RNA.
- It is essential for the vitality and division of the cell.
- It is the site of storage of genetic information



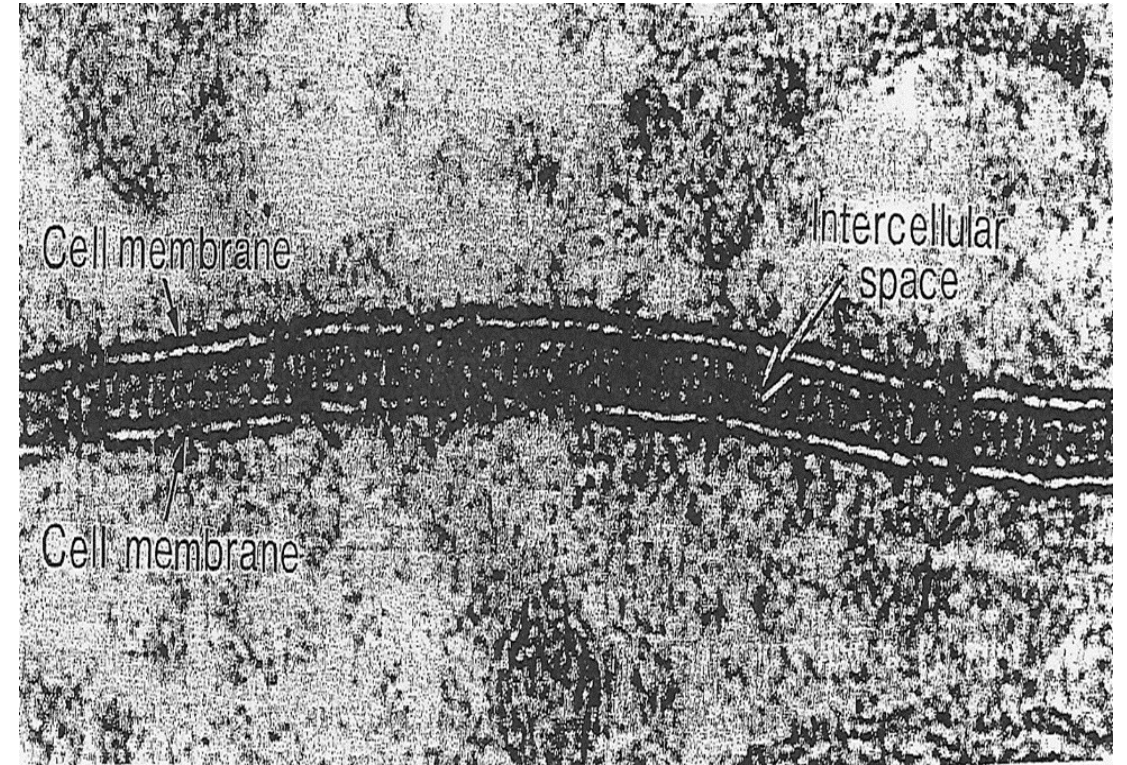
# Cell membrane (trilaminar appearance )

**Q1- Identify the structure? :**

Cell membrane

**Q2- Function of the cell membrane :**

Selective barrier





# Mitochondria

## Q1- Identify the structure?

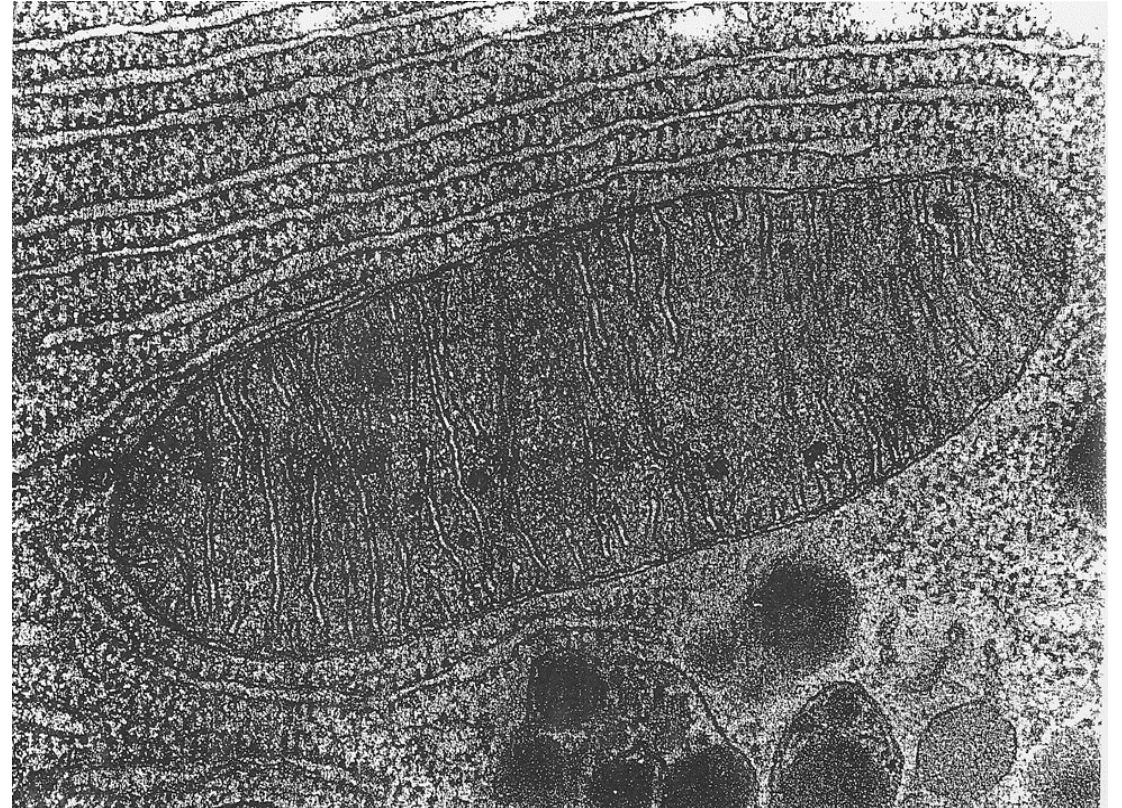
Mitochondria

## Q2- What are Characteristics of it?

- 1) Rod-shaped
- 2) Its wall has 2 membranes
- 3) They can form their own protein and undergo self replication because they have their own DNA

## Q3- What is the function ?

- 1) Generation of ATP “the are called the power house”





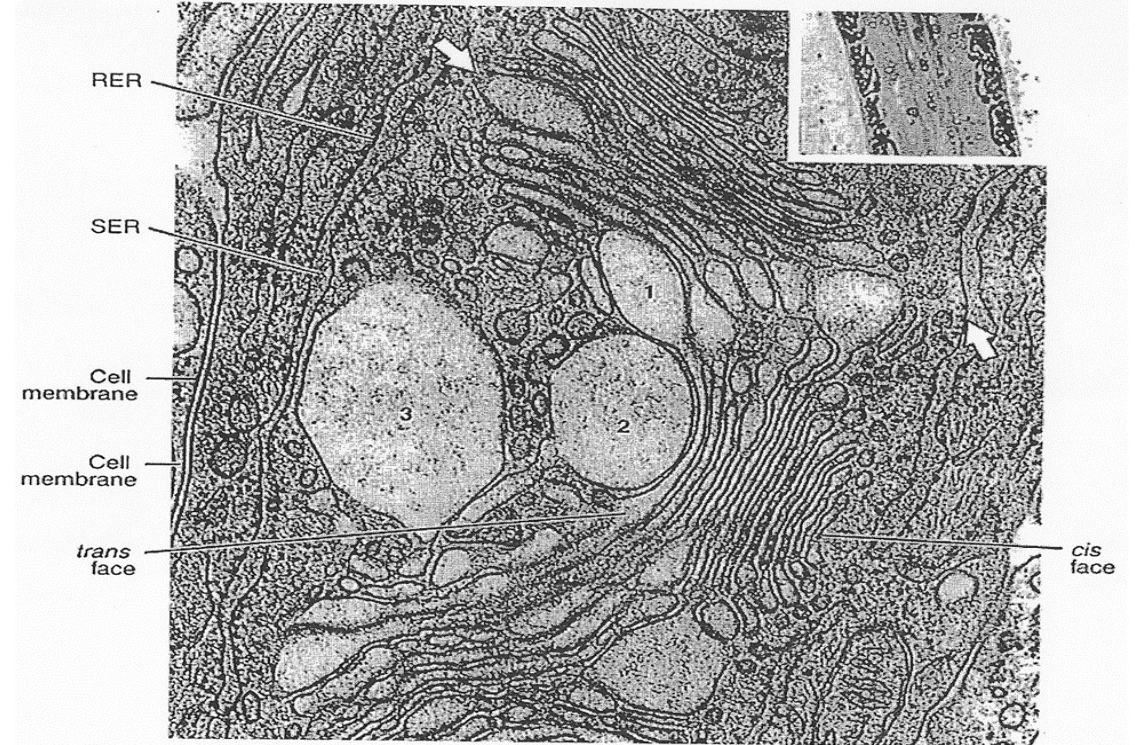
# Golgi Apparatus

**Q1- Identify the structure?**

Golgi apparatus

**Q2- What is the function ?**

- 1.Sorting, modification & packaging of proteins
- 2.Secretory vesicles formation



# Smooth Endoplasmic Reticulum

## Q1- Identify the structure?

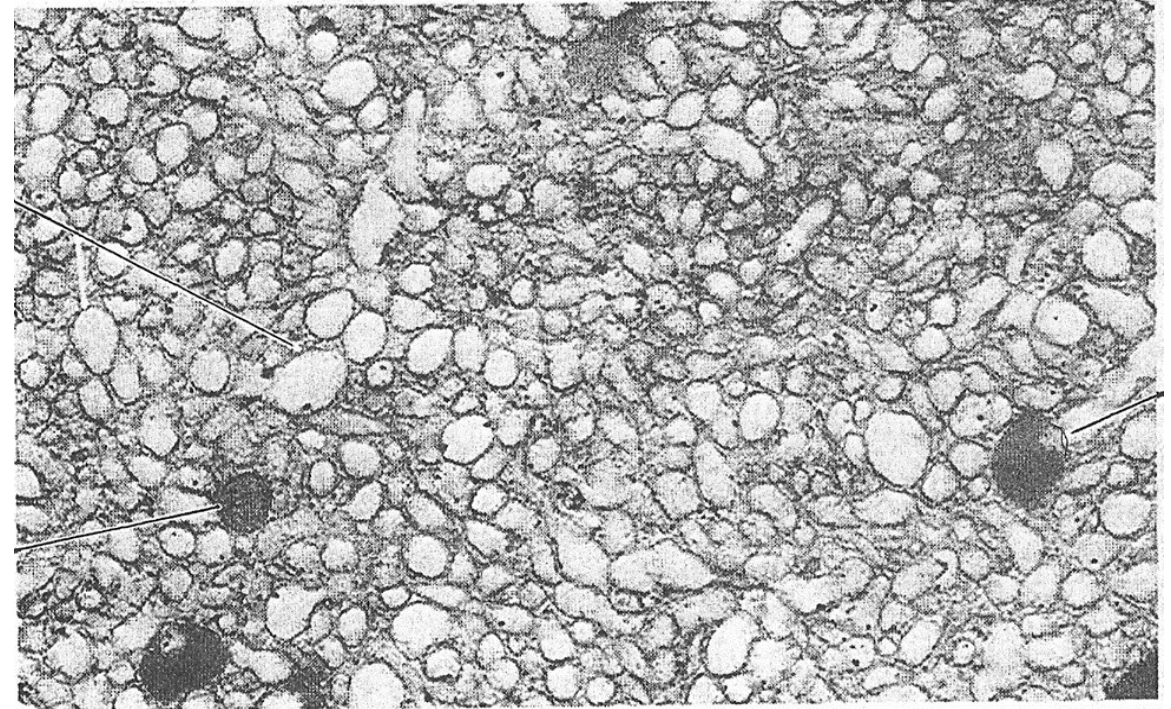
Smooth Endoplasmic Reticulum

## Q2- What are Characteristics of it?

Membranous tubules and vesicles, with no ribosomes of the surface

## Q3- What is the function ?

Synthesis of lipids & cholesterol  
Detoxification from drugs and toxins





# Rough Endoplasmic Reticulum

## Q1- Identify the structure

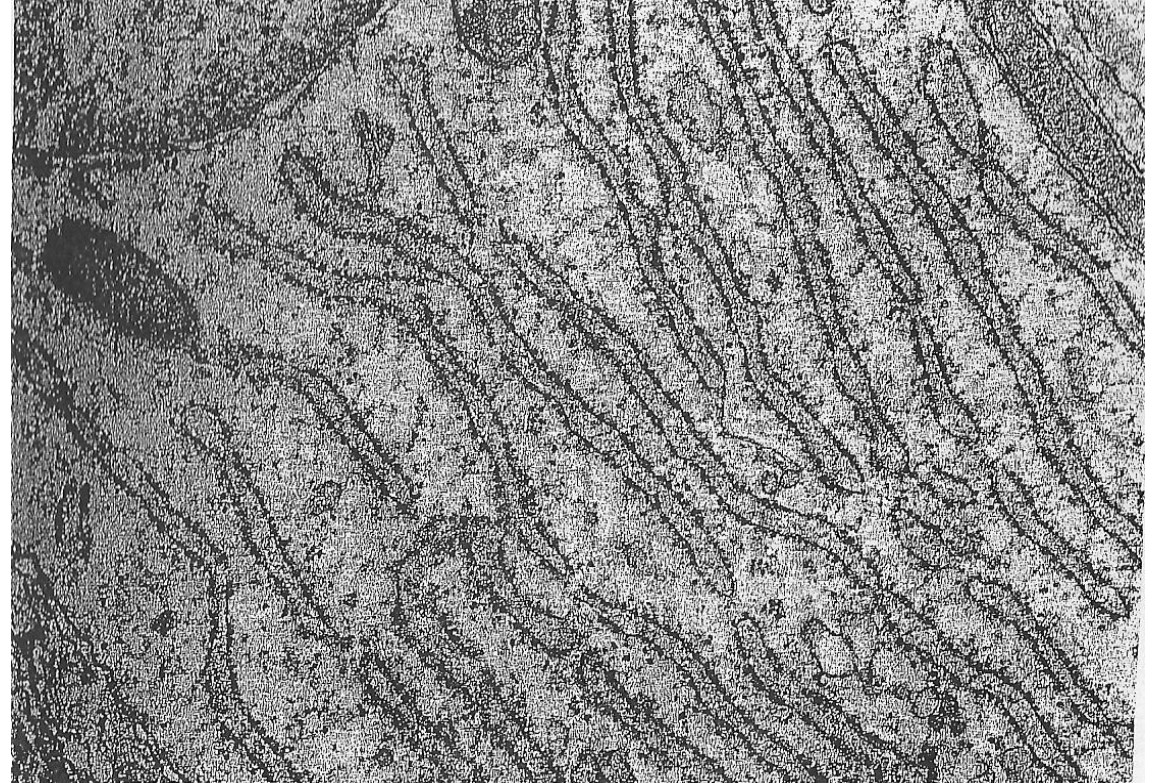
Rough Endoplasmic Reticulum

## Q2- What are Characteristics of it?

Membranous sheets of flattened tubules & vesicles with ribosomes on the surface

## Q3- What is the function ?

Synthesis of proteins by ribosomes on its outer surface.





# Centrioles

## Q1- Identify the structure

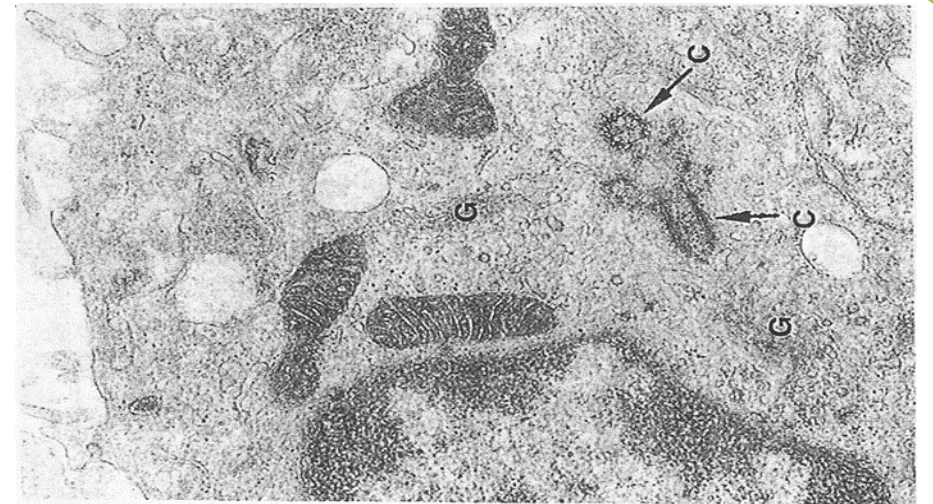
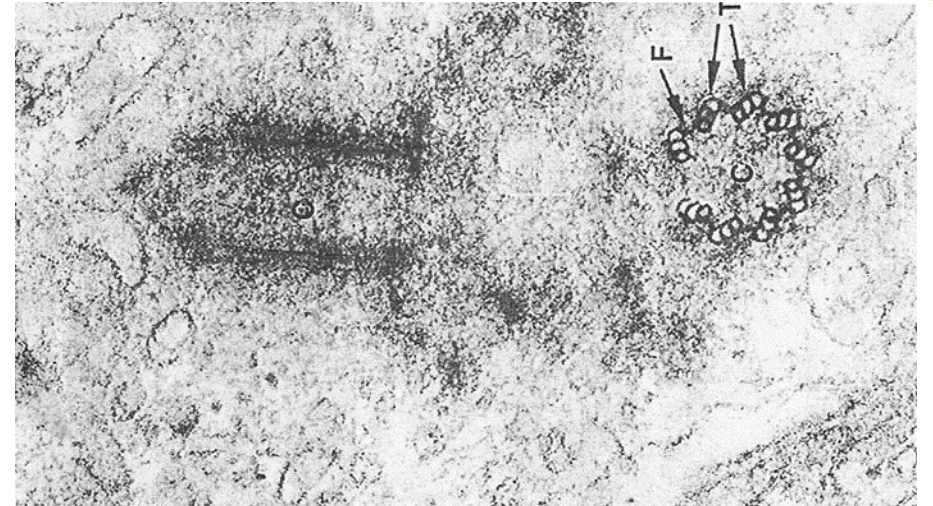
Centrioles

## Q2- What are Characteristics of it?

- 2 cylinders which are perpendicular to each other
- **\*their wall is made of 9 triplets of microtubules (9x3 = 27)**
- Non membranous organelle

## Q3- What is the function of it?

- Essential for cell division
- Formation of cilia and flagella





# Cilia

## Q1- Identify the structure?

Cilia

## Q2- What are Characteristics of it?

Hair like striations on the free surface of some cells

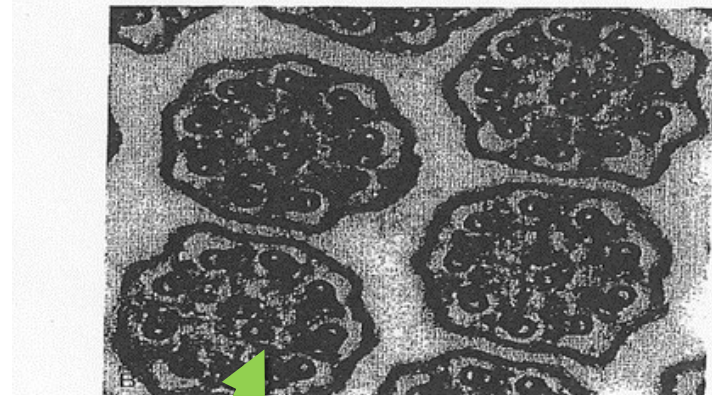
**\*Shaft form of 9 doublets & 2 central singlets of microtubules (9x2 + 2 = 20)**

## Q3- What is the function of it?

Movement of particles or fluids in one direction



L.S.



T.S.

Microtubules (9 doublets and 2 central)

# Microvilli

## Q1- Identify the structure?

Microvilli

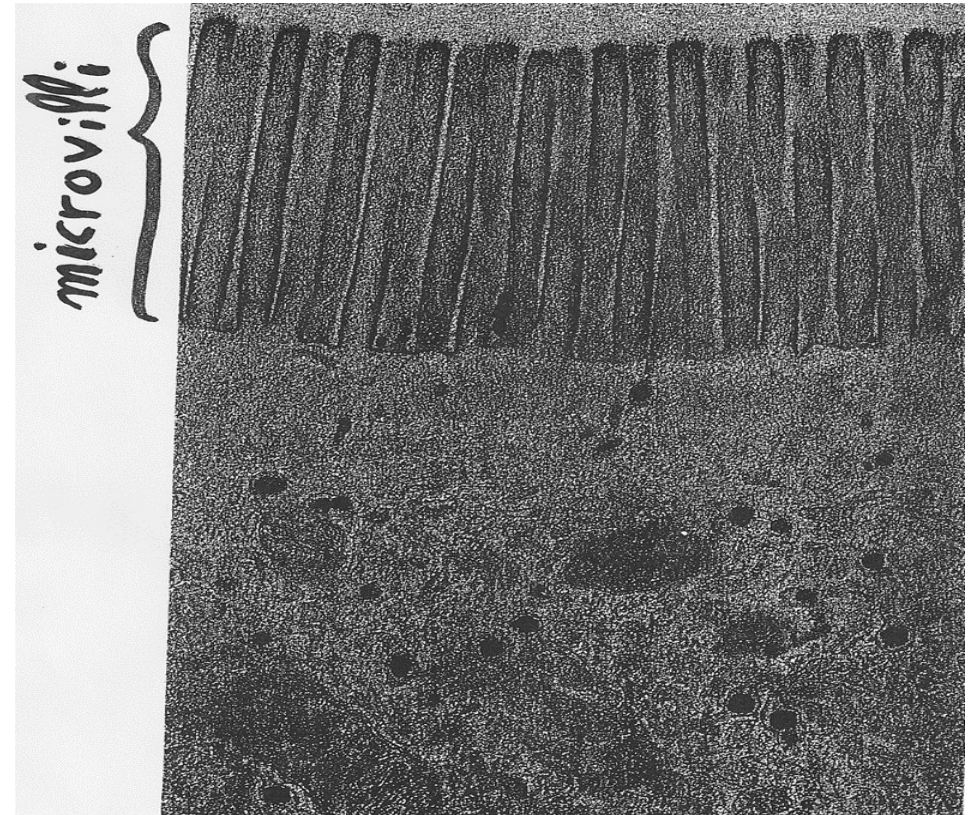
## Q2- What are Characteristics of it?

Cylindrical cytoplasmic projections of apical surface to increase surface area

**\*they contain actin filament (microfilaments)**

## Q3- What is the function of it ?

Increase surface area for more absorption



# EPITHELIAL TISSUE

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# Simple Squamous Epithelium

## Q1- Identify the type of epithelium?

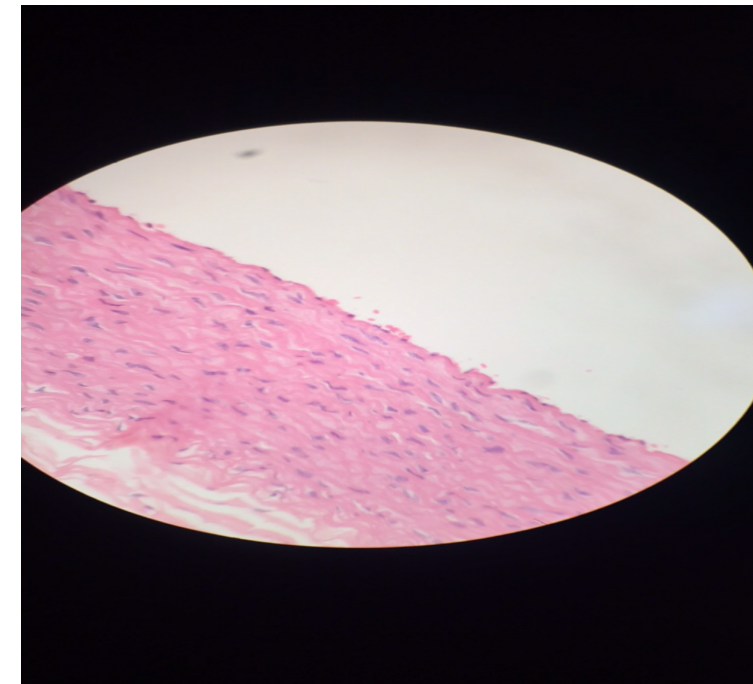
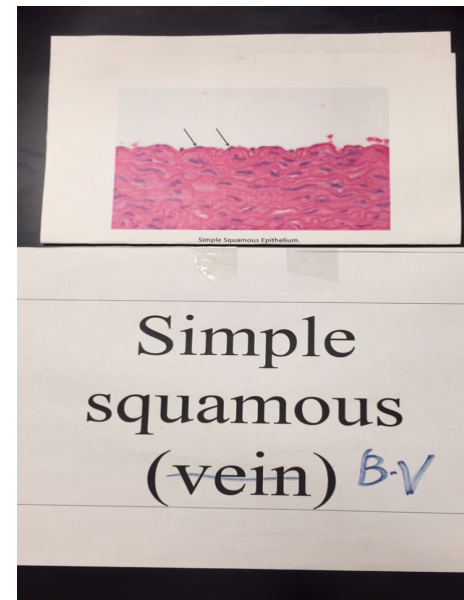
Simple squamous epithelium

## Q2- mention the organs (distribution, site & example)?

- Endothelium of Aorta
- Alveoli of lungs

## Q3- What are Characteristics of it?

- One layer
- Flat cells
- Flat nuclei



# Simple Cuboidal Epithelium

## Q1- Identify the type of epithelium?

Simple cuboidal epithelium

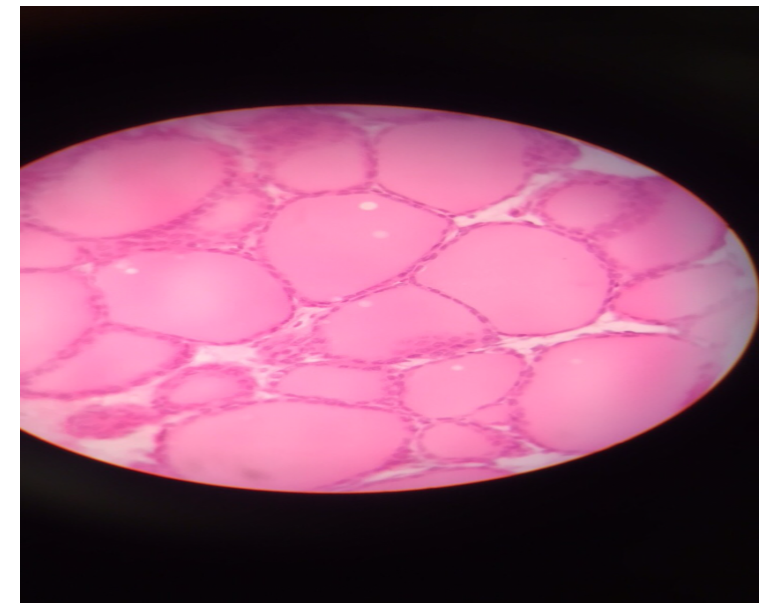
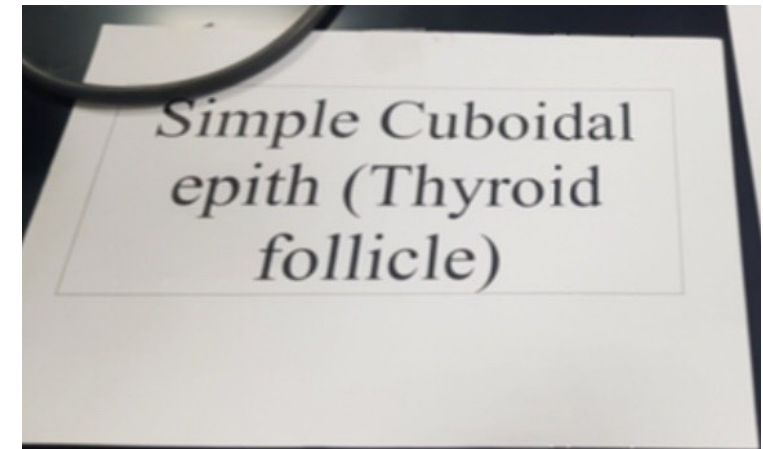
## Q2- mention the organs (distribution, site & example)?

Thyroid gland (follicles)

salivary glands

## Q3- What are Characteristics of it?

- One layer
- cuboidal cells
- Round central nuclei



# Simple Columnar Epithelium

## Q1- Identify the type of epithelium?

Simple columnar epithelium with goblet cells

## Q2- mention the organs (distribution, site & example)?

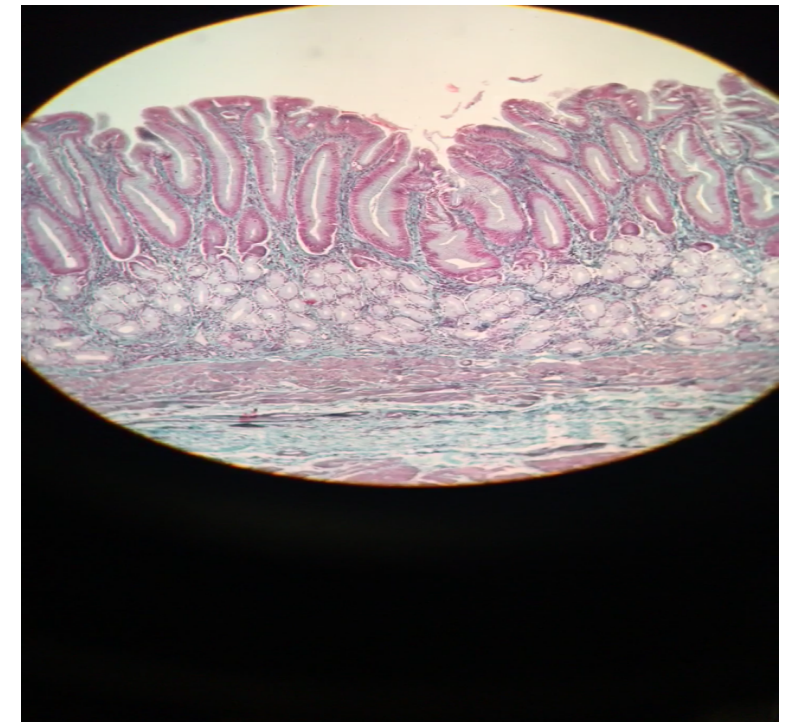
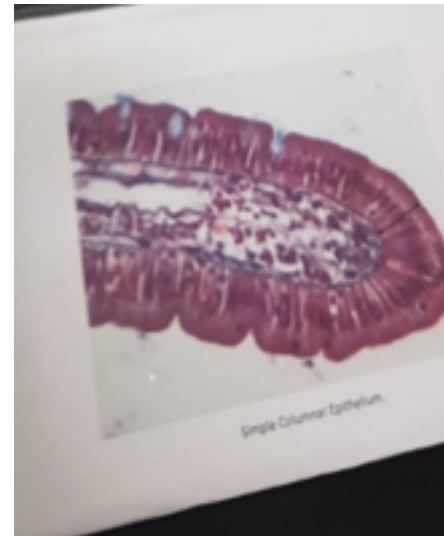
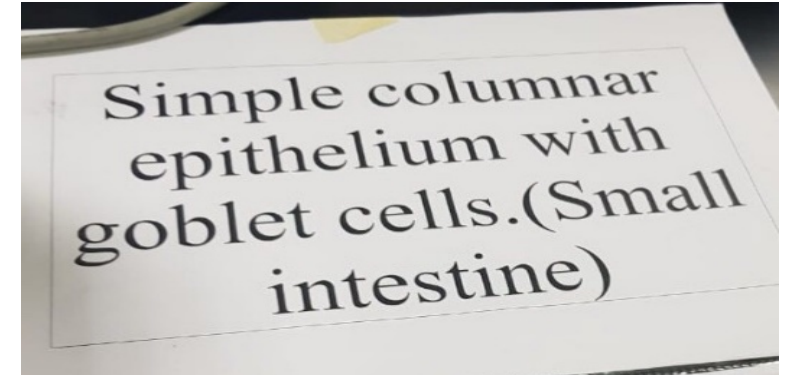
- GIT –small intestine (with goblet cell)
- GIT -stomach and gall bladder (without goblet cell)

## Q3- What is the function of the pointed area?

Secreting mucus

## Q4- What are Characteristics of it?

- One layer
- columnar cells
- basal oval nuclei



# Pseudostratified columnar ciliated with goblet cells

## Q1- Identify the type of epithelium?

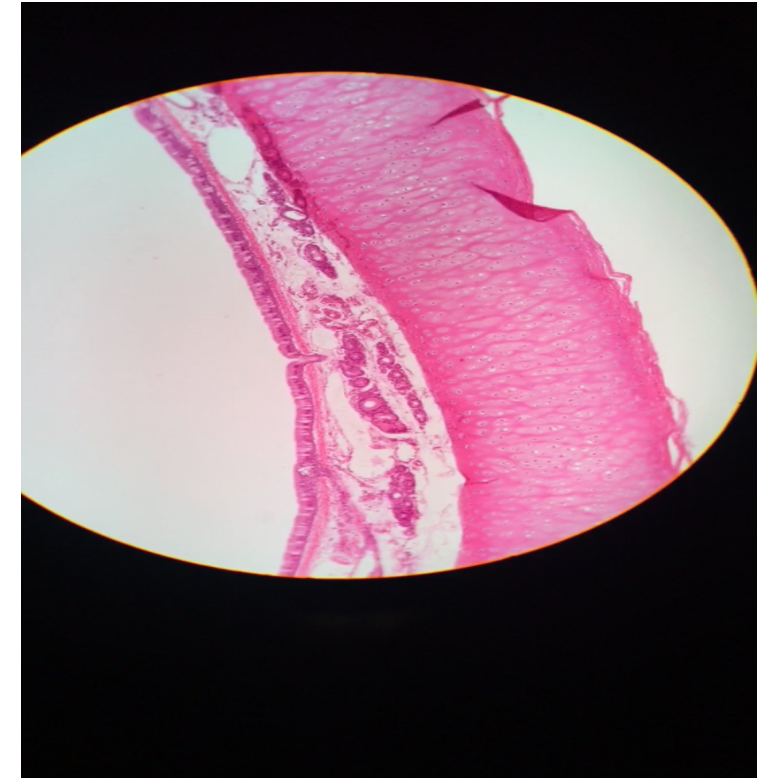
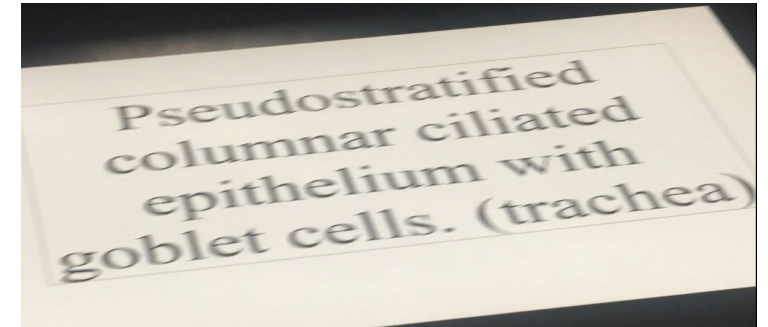
Pseudostratified Columnar epithelium “ciliated with goblet cells”

## Q2- mention the organs (distribution, site & example)?

- Trachea
- bronchi

## Q3- What are Characteristics of it?

- One layer
- columnar cells
- Nuclei appear at different levels
- All cells rest on basement membrane Some are tall, others are short that can't make to surface





# Keratinized Stratified Squamous Epithelium

## Q1- Identify the type of epithelium?

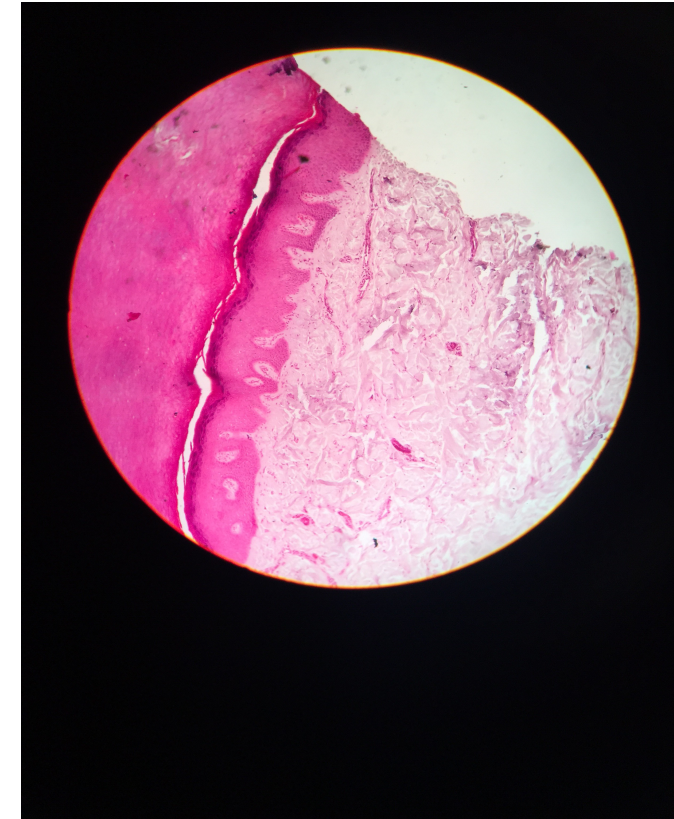
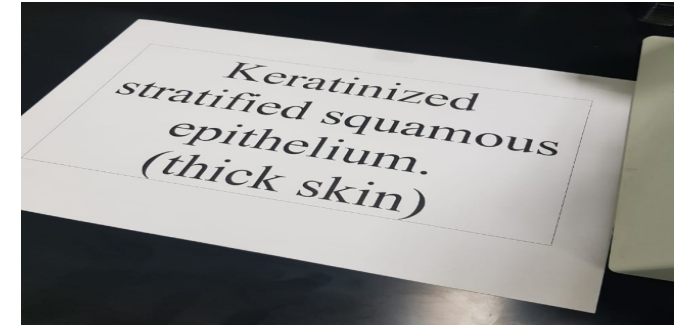
Keratinized Stratified Squamous Epithelium

## Q2- mention the organs (distribution, site & example)?

Epidermis of skin

## Q3- What are Characteristics of it?

- multiple layers
- basal cells: columnar, basal oval nuclei
- Intermediate cells: polygonal , central rounded nuclei
- Surface cells: flat, flattened nuclei
- With layer of keratin on the surface





# Non-Keratinized Stratified Squamous Epithelium

## Q1- Identify the type of epithelium?

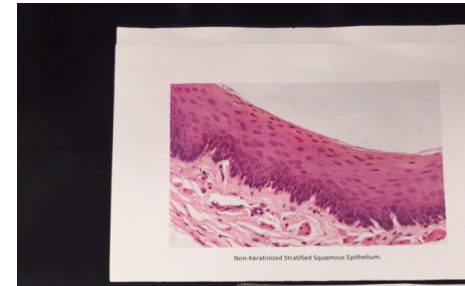
Non-keratinized Stratified Squamous Epithelium

## Q2- mention the organs (distribution, site & example)?

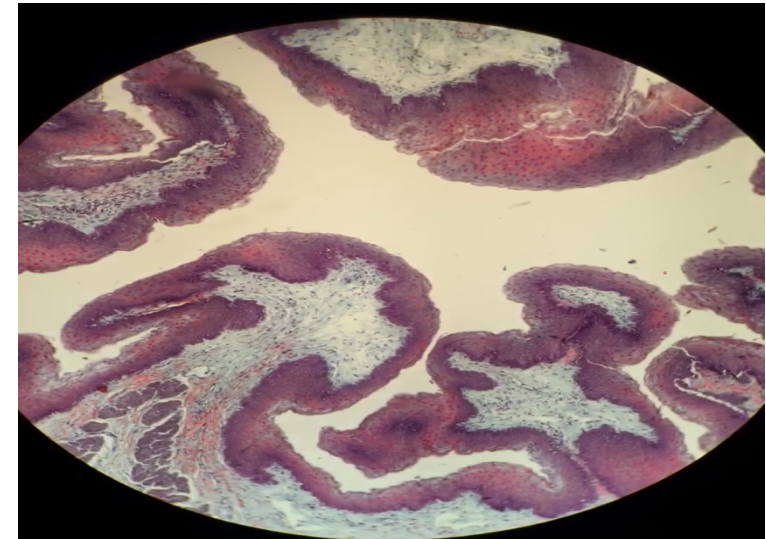
Esophagus

## Q3- What are Characteristics of it?

- multiple layers
- basal cells: columnar, basal oval nuclei
- Intermediate cells: polygonal , central rounded nuclei
- Surface cells: flat, flattened nuclei
- Without a layer of keratin on the surface



-Non-keratinized stratified squamous epithelium. (esophagus)



# Transitional epithelium

## Q1- Identify the type of epithelium?

Transitional epithelium

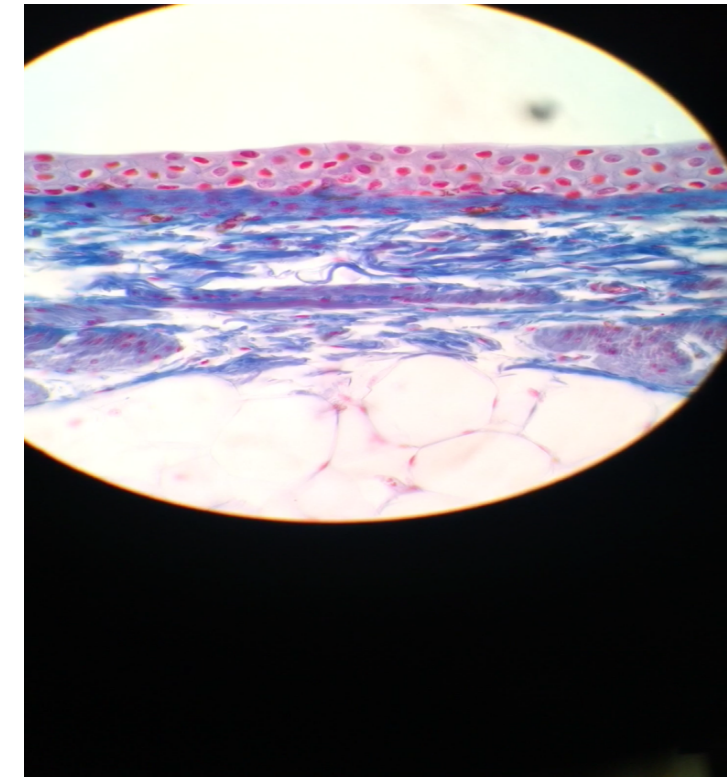
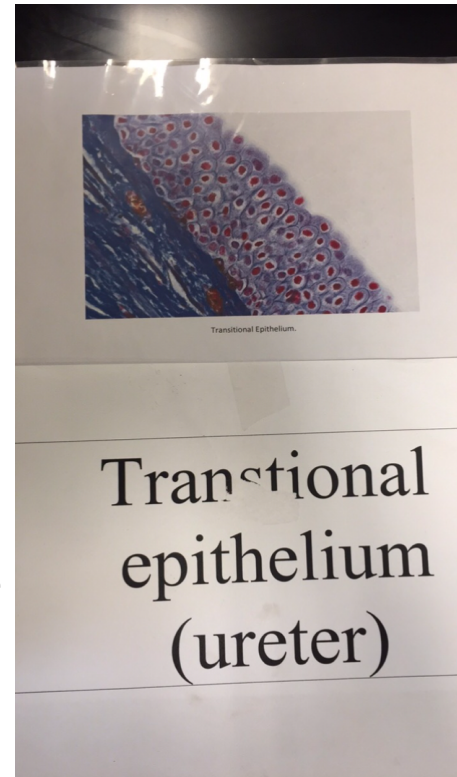
## Q2- mention the organs (distribution, site & example)?

Urinary bladder

Ureters

## Q3- What are Characteristics of it?

- multiple layers
- basal cells: columnar
- Intermediate cells: polygonal
- Surface cells: large cuboidal with convex free surface maybe binucleated



# CONNECTIVE TISSUE

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# Dense collagenous regular connective tissue

## Q1- Identify the structure?

Dense collagenous regular connective tissue

## Q2- What is the type of fibers?

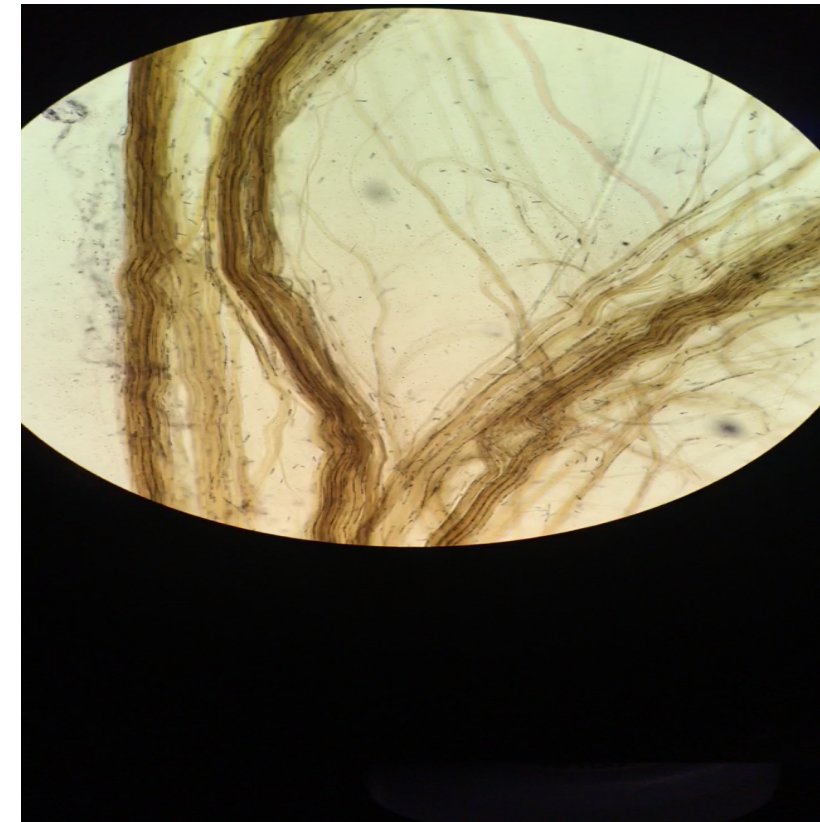
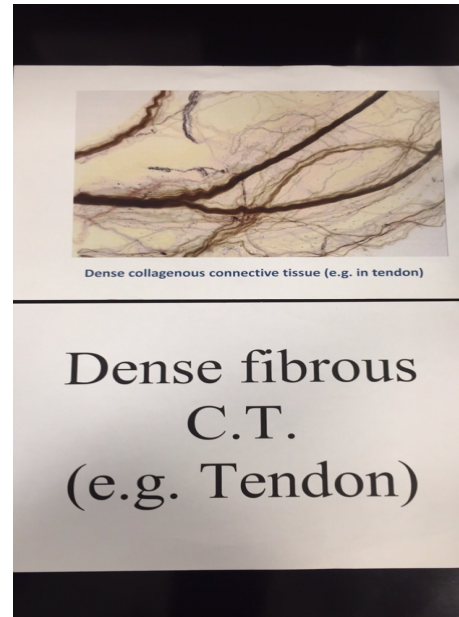
Collagen fiber (Collagen type I)

## Q3- What is the type of cells?

Fibroblast cells

## Q4- mention the organs (distribution, site & example)?

- Tendons
- ligaments





# Elastic connective tissue

**Q1- Identify the structure?**

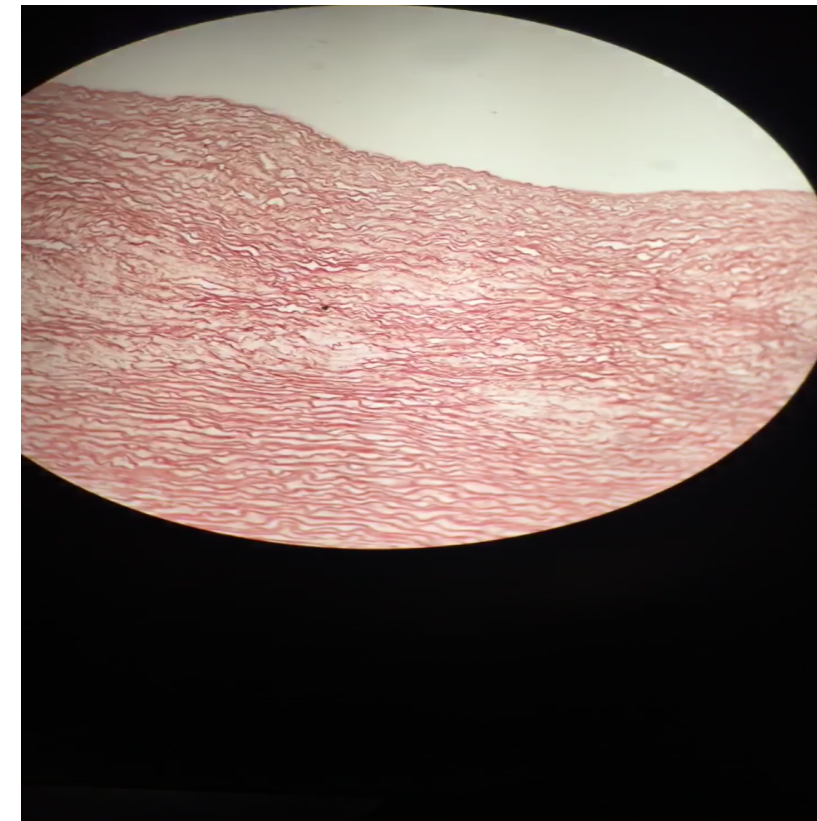
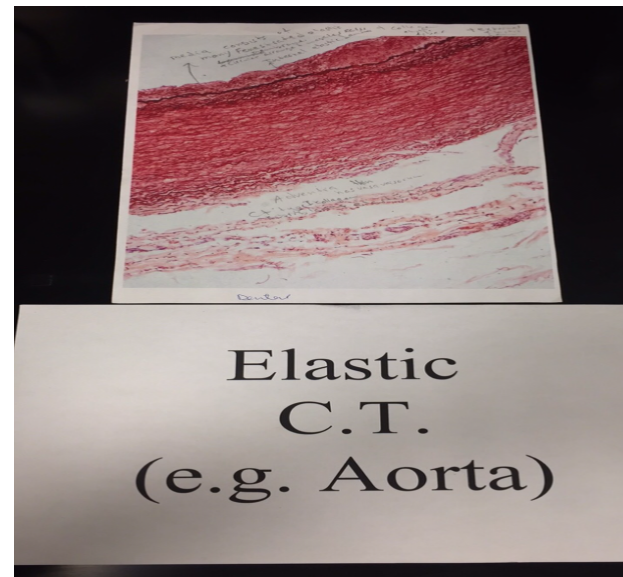
Elastic connective tissue

**Q2- What is the type of cells?**

Fibroblast cells

**Q3- mention the organs (distribution, site & example)?**

Aorta



# Adipose Connective Tissue

**Q1- Identify the type of connective tissue?**

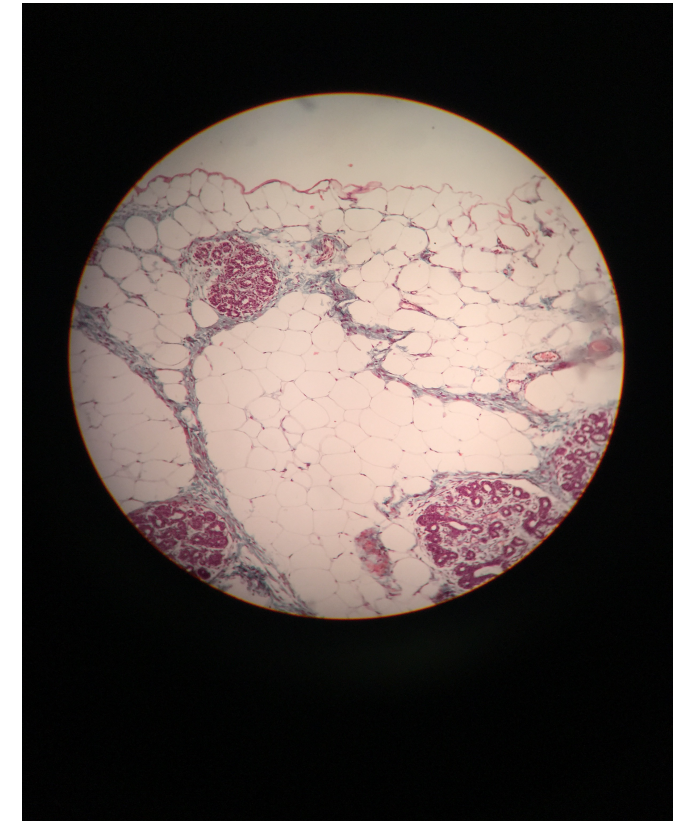
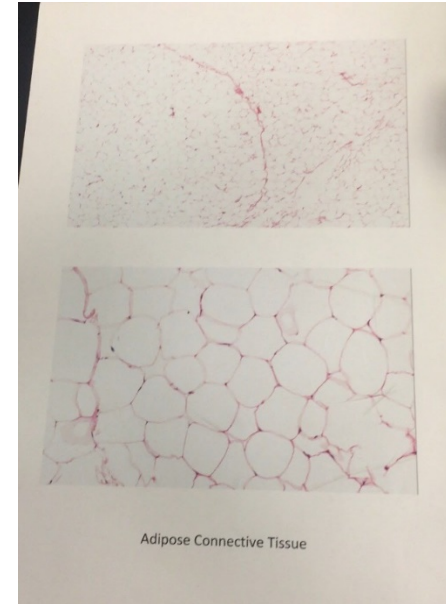
Adipose connective tissue

**Q2- What is the type of cells ?**

Adipocyte

**Q3- mention the organs (distribution, site & example)?**

- Around the kidney
- Female breast
- Abdominal wall
- buttocks



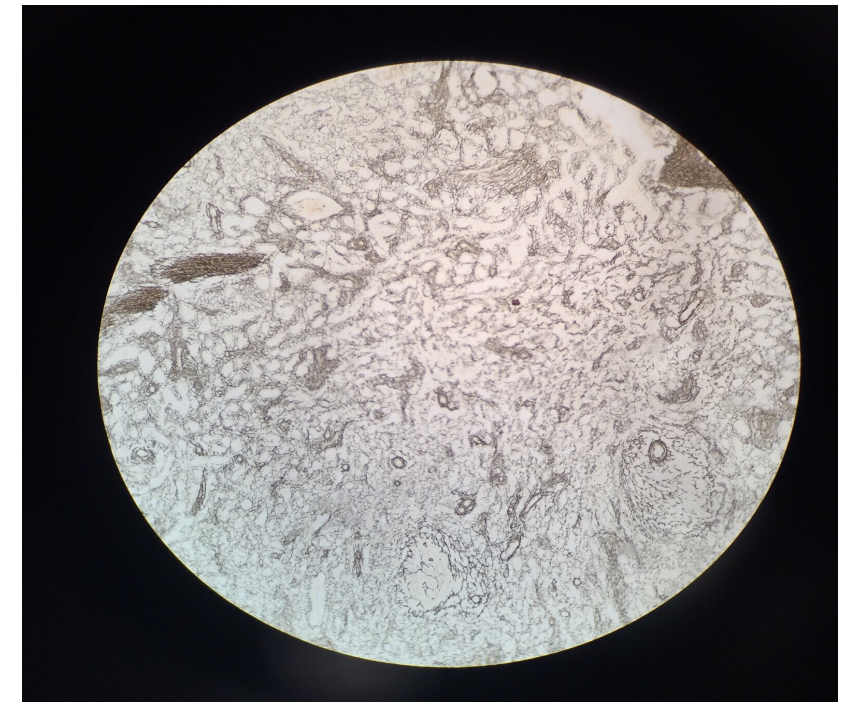
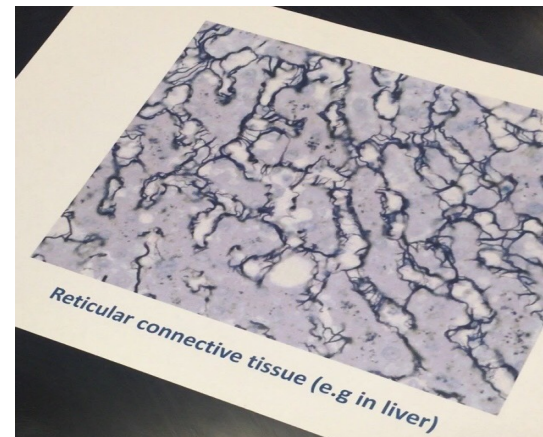
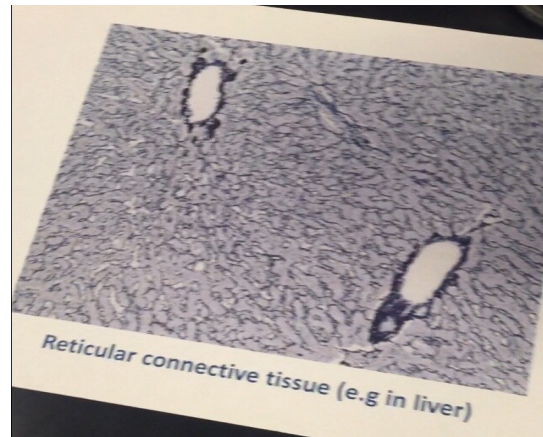
# Reticular connective tissue

**Q1- Identify the type of connective tissue?**

Reticular connective tissue (Collagen type III)

**Q2- mention the organ?**

- Lymph node
- spleen
- liver



# LYMPHOID TISSUE

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\*We recommend reading the slides for this lecture



# Lymph Node

## Q1- Identify the structure?

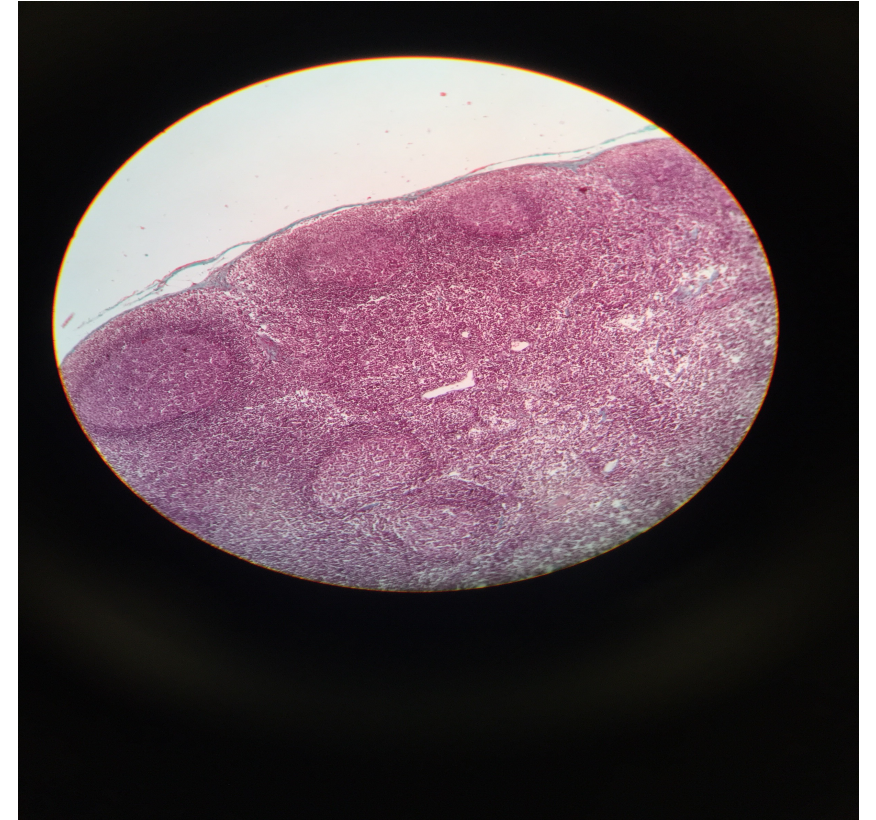
Lymph node

## Q2- What is the function of it?

- 1-Proliferation of B and T lymphocytes.
- 2-Filtration of lymph from bacteria and other foreign substances.

## Q3- What is the main part of the structure ?

- 1- Cortex ( lymph nodules follicles)
- 2- Paracortex
- 3- Medulla



# Thymus

## Q1- Identify the structure?

Thymus (incomplete septum)

## Q3- What is the main part of the structure ?

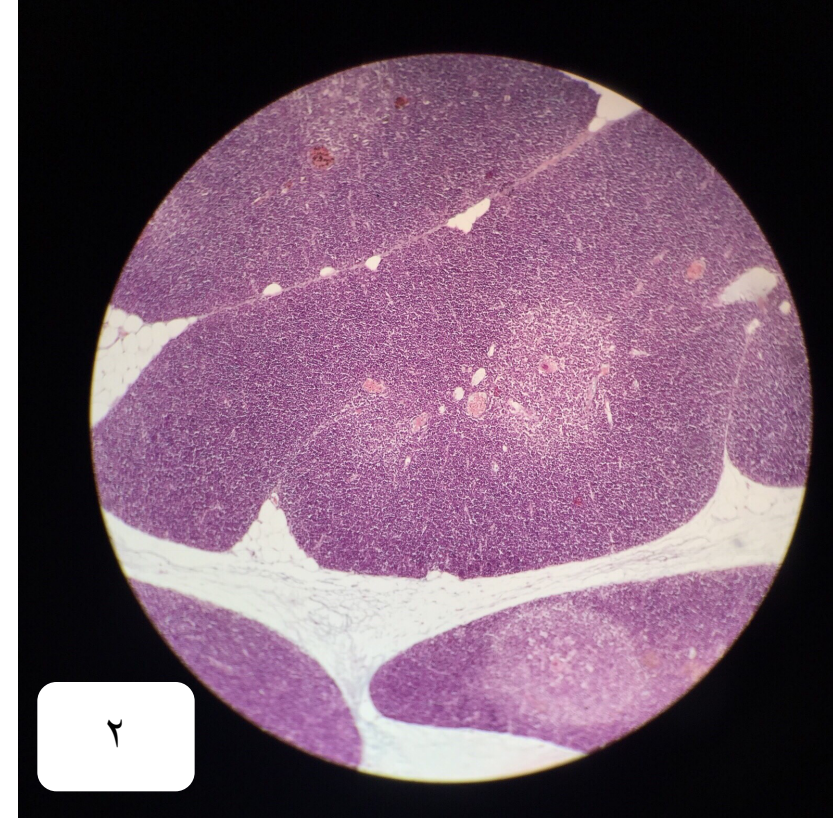
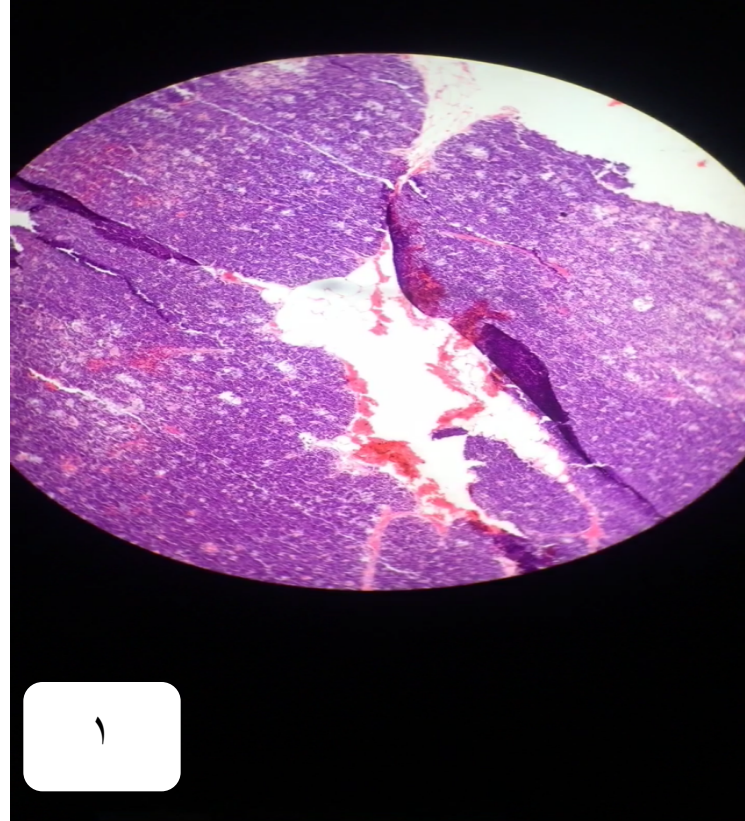
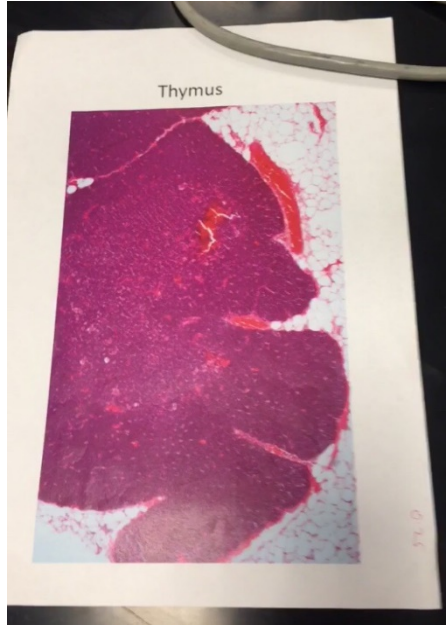
- Cortex : immature t-lymphocytes
- Medulla : mature t-lymphocytes + (Hassall's corpuscles)

## Q3- What is the main type of the cell

T-lymphocytes

## Q4 - What is the function of it?

- 1- Maturation of T lymphocytes
- 2- It involutes after puberty and becomes infiltrated by adipose tissue.
- 3- Remnants of thymus remain in adult to form T lymphocytes.



١- قبل التعديل  
٢- بعد التعديل ؛ لأن حصل لها تحريك  
، ف الدكتورة غيرت السلايدز وهو اللي  
بنعتمد عليه



# Palatine Tonsil

## Q1- Identify the structure?

Palatine tonsil (incomplete capsule)

## Q2- What is the type of epithelium?

Non-keratinized Stratified Squamous Epithelium

## Q3- What is the function of it

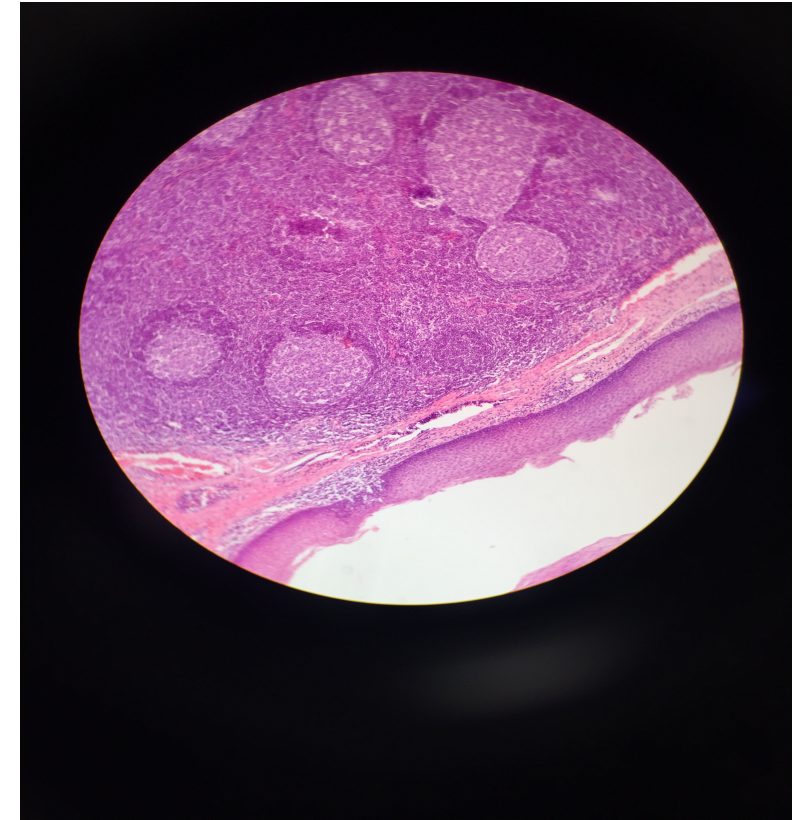
Production of antibodies

## Q4- Where is located

At the entrance of oral pharynx

## Q3- What is the main part of the structure ?

1. incomplete capsule
2. Stratified squamous epithelium
3. Cleft (crypt)
4. follicles



# Spleen

## Q1- Identify the structure?

Spleen

## Q2- What is the function of it?

- 1-Filtration of blood.
- 2-Phagocytosis of old RBCs & old blood platelets , invading microorganisms.
- 3-Production , proliferation of immunocompetent B & T lymphocytes.
- 4-Production of antibodies.

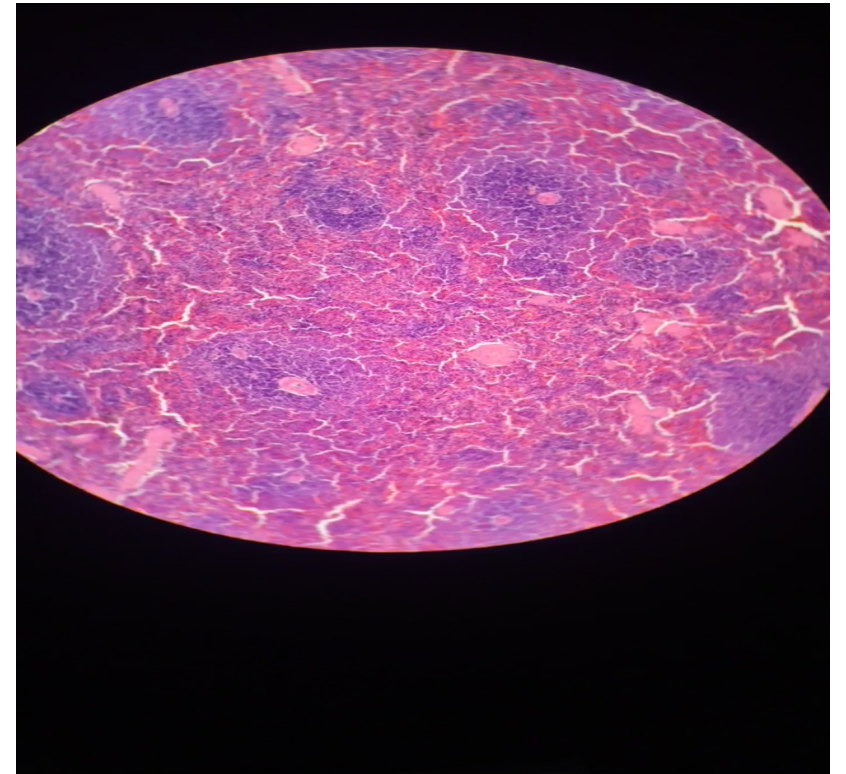
## Q3- What is the main part of the structure ?

### ❑ White pulp

- 1) Periarterial lymphatic sheaths ( PALS)
- 2) Lymphoid follicles

### ❑ Red pulp

- 1) Splenic cords
- 2) Splenic blood sinusoids



## Team members :

- Reem alessa

## Team leaders :

- Noura alnasser
- Abdullah shadid

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Good Luck 

