



All lecture of practical OSPE file



Red: questions.

Dark red: very important.

Black: complete answers.

Gray: notes | extra.

Editing File

➤ You should know before the exam:

- The diagrams in these slides are going to be the **same** in the exam however, it may not be coloured.
- You have to **mention the full name** always and **don't use shortcuts** you could lose marks because of that.
- The **Arrows** in the diagrams are **very important** .
- So please study them well.

CELL STRUCTURE

Practical histology (OSPE) team 437 | Foundation block



Nucleus

Q1- Identify the structure?

Nucleus

Q2- Location of:

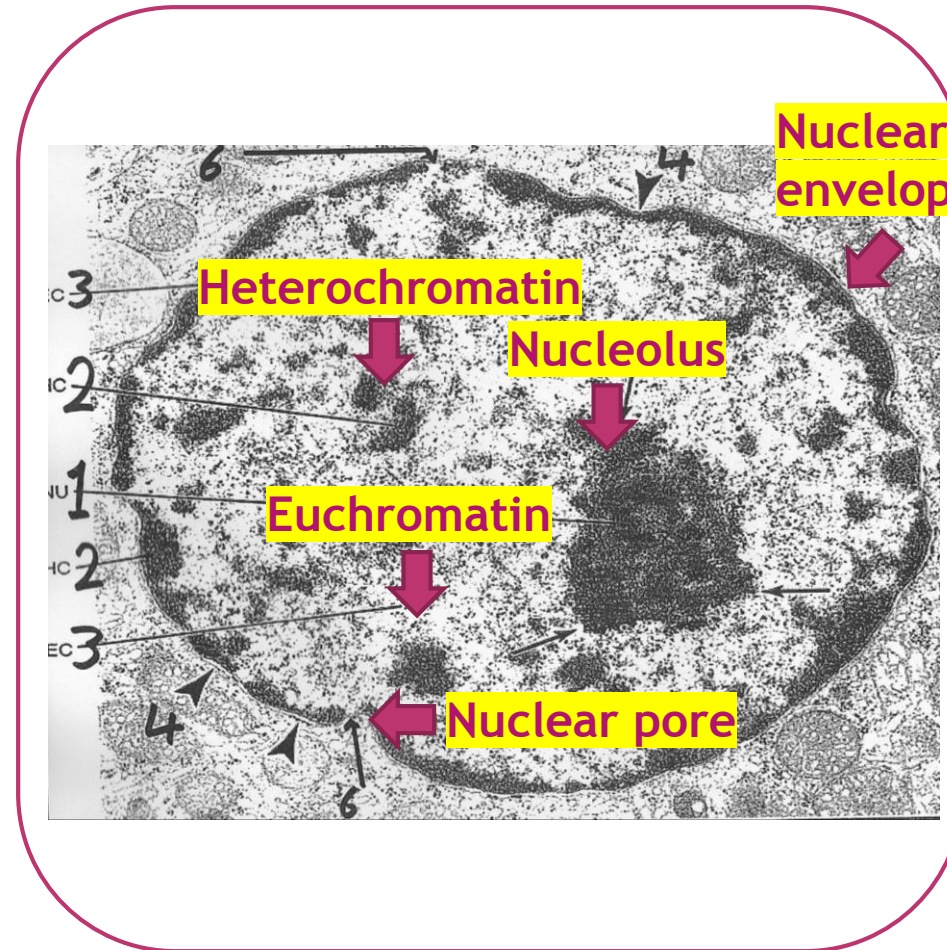
- Heterochromatin (dark and inactive)
- Euchromatin (pale and active)
- Nuclear pore (openings in the **nuclear envelope**)
- Nuclear envelope (lining the nucleus)
- Nucleolus (the biggest dark region in the nucleus)

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 **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



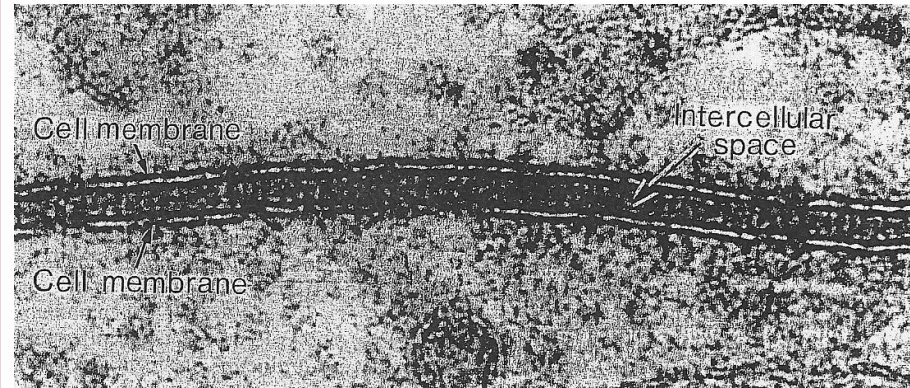
Cell membranes (trilaminar appearance)

Q1- Identify the structure?

Cell membrane

Q2- What is the function of it?

Selective barrier



Mitochondria

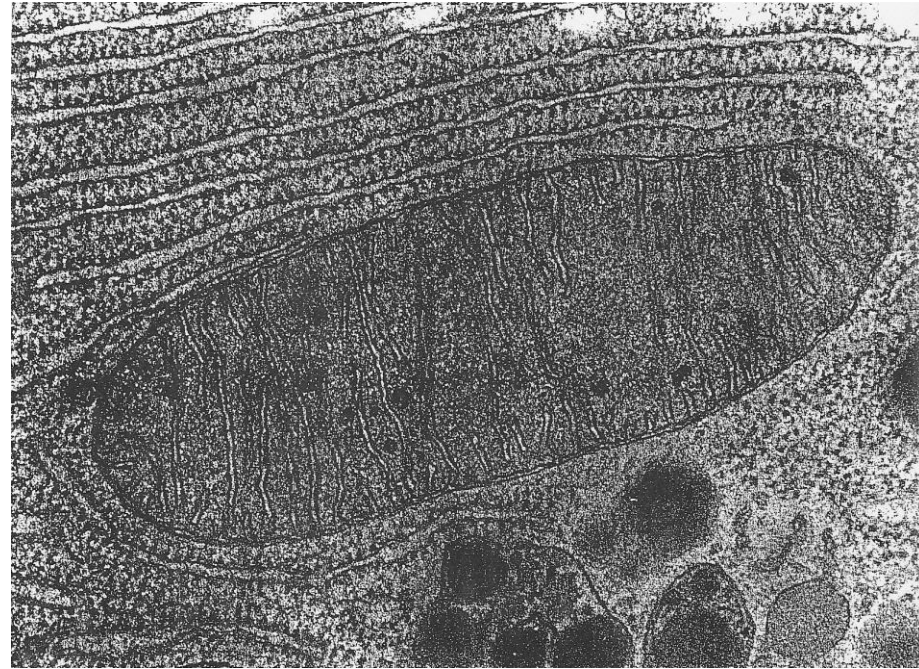
Q1- Identify the structure?
Mitochondria

Q2- What are Characteristics of it?

- Rod-shaped
- It has 2 membranes

Q3- What is the function of it?

- 1) Generation of ATP “the are called the power house”
- 2) The can form their own proteins and undergo self replication, because they have their own DNA



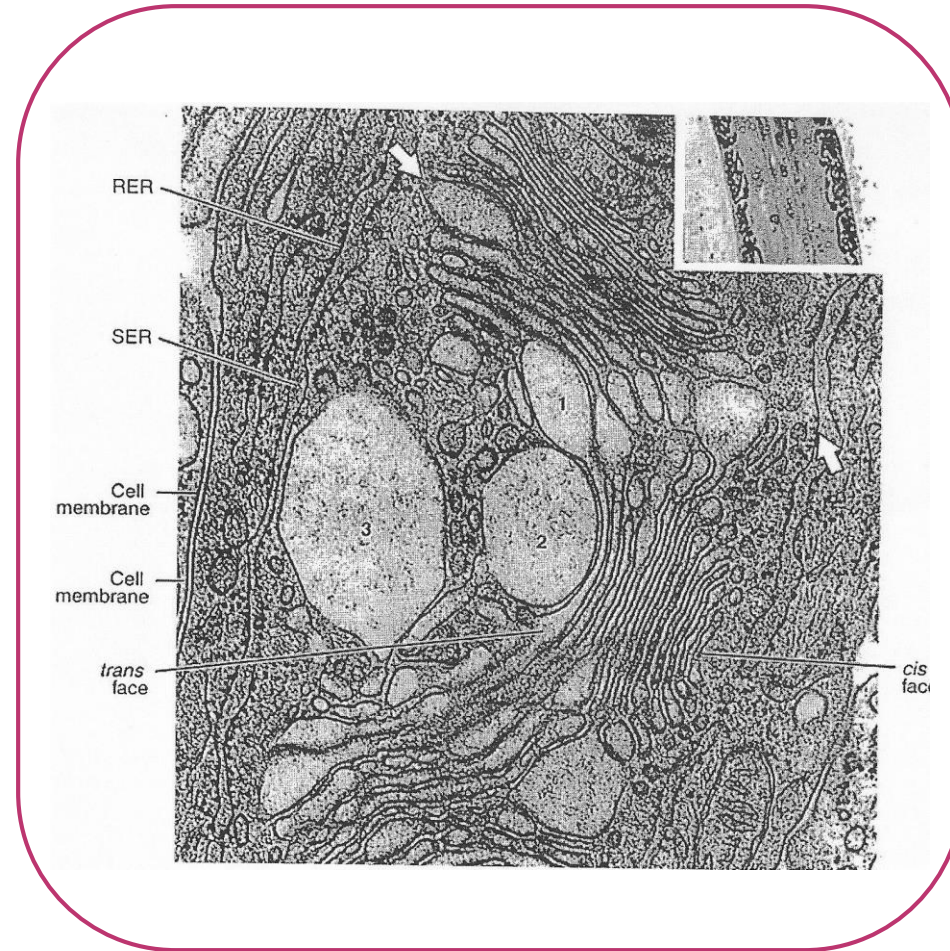
Golgi Apparatus

Q1- Identify the structure?

Golgi apparatus

Q2- What is the function of it?

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



Smooth endoplasmic reticulum

Q1- Identify the structure?

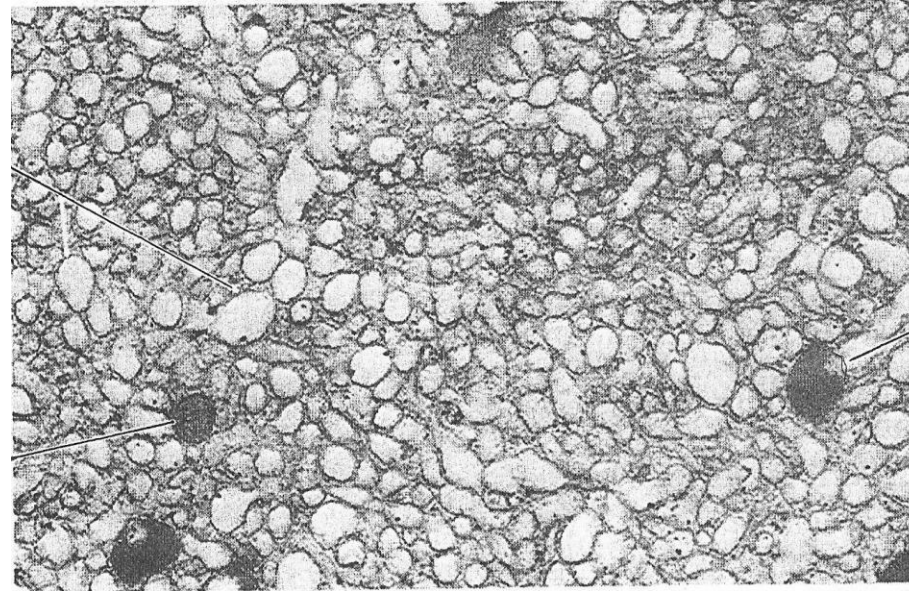
Smooth endoplasmic reticulum

Q2- What are Characteristics of it?

Membranous tubules and vesicles, with no ribosomes of the surface

Q3- What is the function of it?

- 1) Synthesis of lipids & cholesterol
- 2) Detoxification from drugs and toxins



Rough endoplasmic reticulum

Q1- Identify the structure?

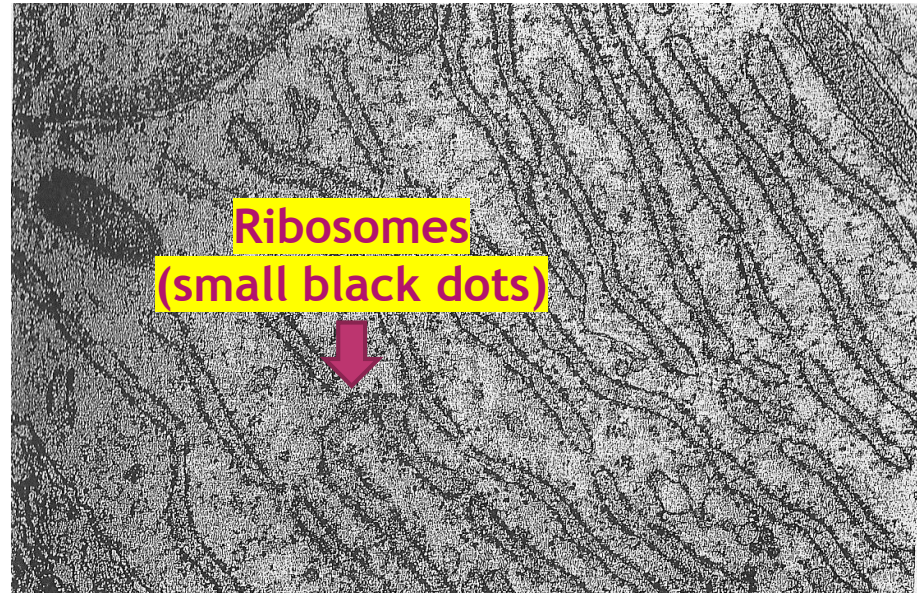
Rough endoplasmic reticulum

Q2- What are Characteristics of it?

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

Q3- What is the function of it?

- Synthesis of proteins by ribosomes on its outer surface



Centrioles

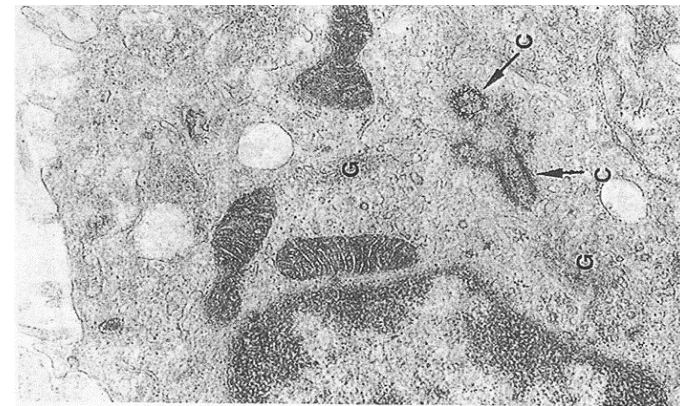
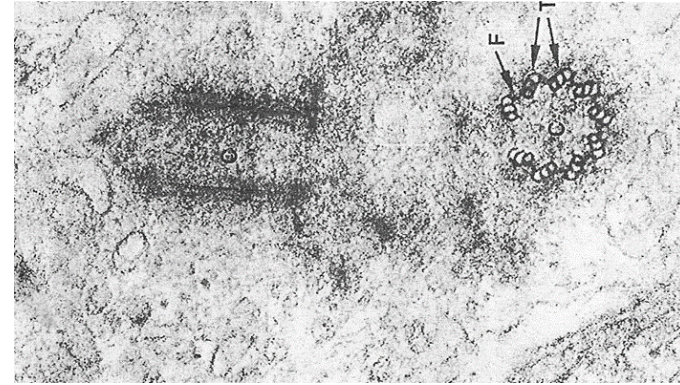
Q1- Identify the structure?
centrioles

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

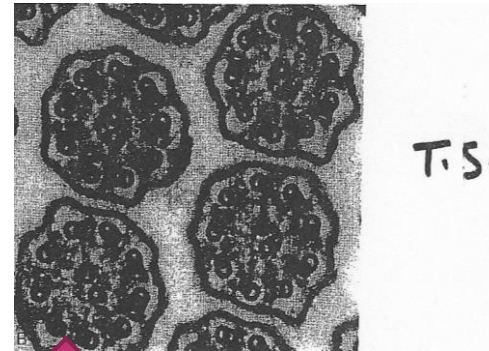
Q2- What are Characteristics of it?

Hair like striations on the free surface of some cells

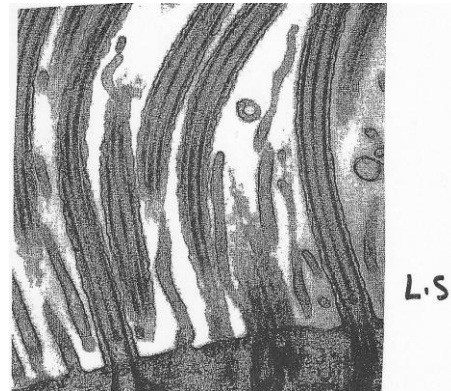
*Shaft form of 9 doublets & 2 central singlets of microtubules (9x2 + 2 = 20)

Q3- What is the function of it?

Movement of particles or fluids in one direction



↑ microtubules
(9 doublets & 2 central singlets)



Microvilli

Q1- Identify the structure?

microvilli

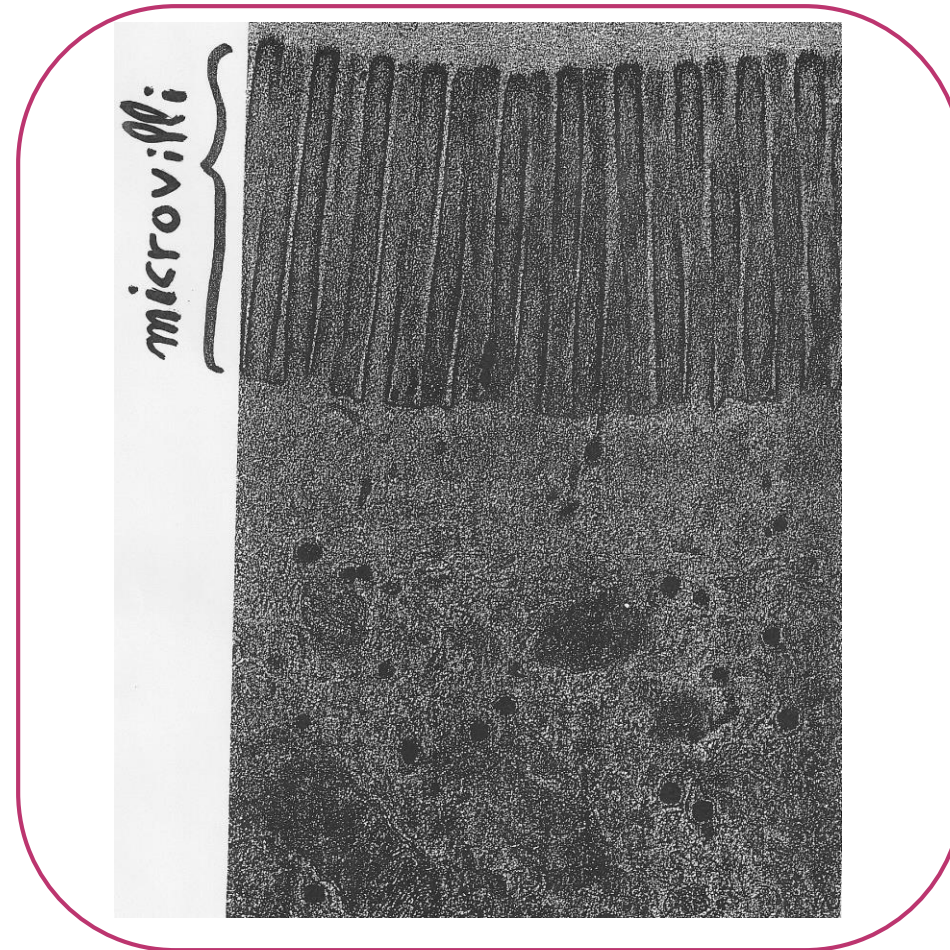
Q2- What are Characteristics of it?

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?

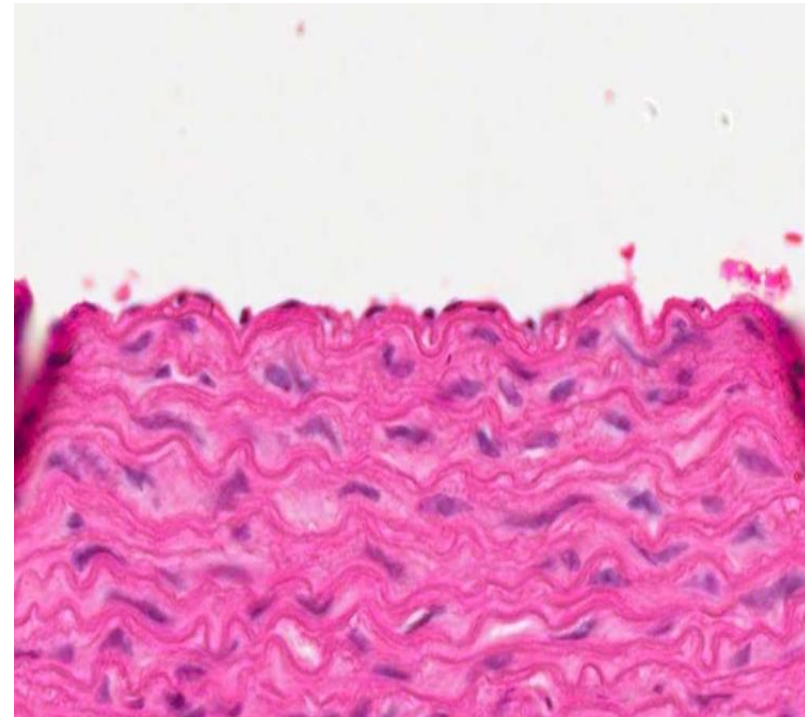
Simple squamous epithelium

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)

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)?

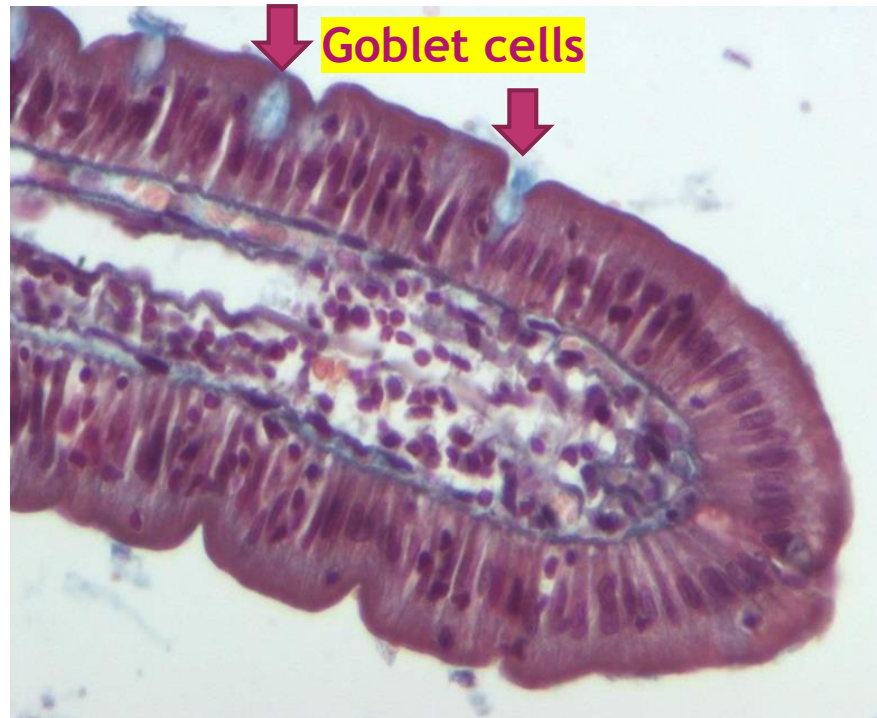
- GIT - small intestine (with goblet cell)
- GIT - stomach and gall bladder (without goblet cell)

Q3- What is the function of the pointed area?

Secreting mucus

Q4- What are Characteristics of it?

- One layer
- columnar cells
- basal oval nuclei
- Goblet cell



Pseudostratified Columnar epithelium

“ciliated with goblet cells”

Q1- Identify the type of epithelium?

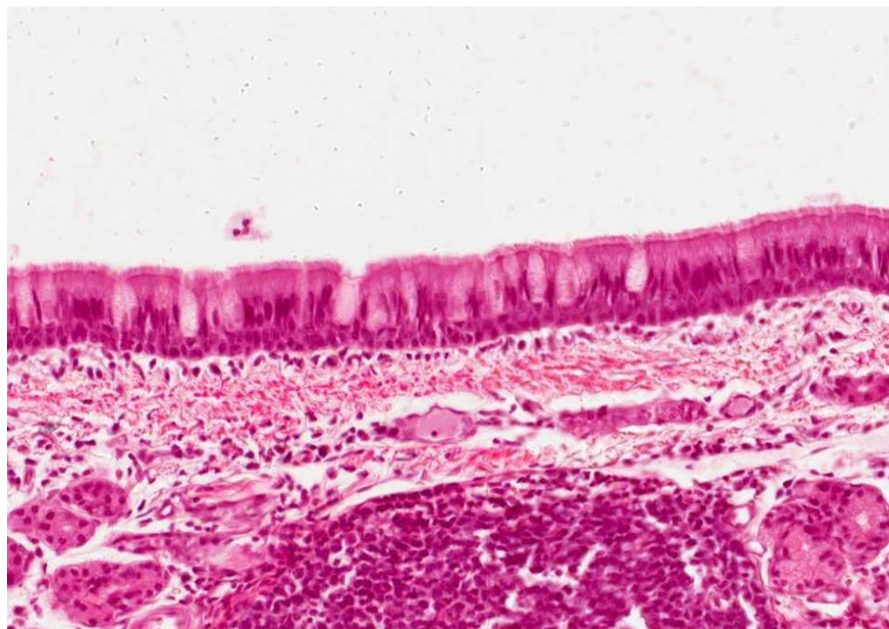
Pseudostratified Columnar epithelium “ciliated with goblet cells”

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



Stratified squamous epithelium keratinized

Q1- Identify the type of epithelium?

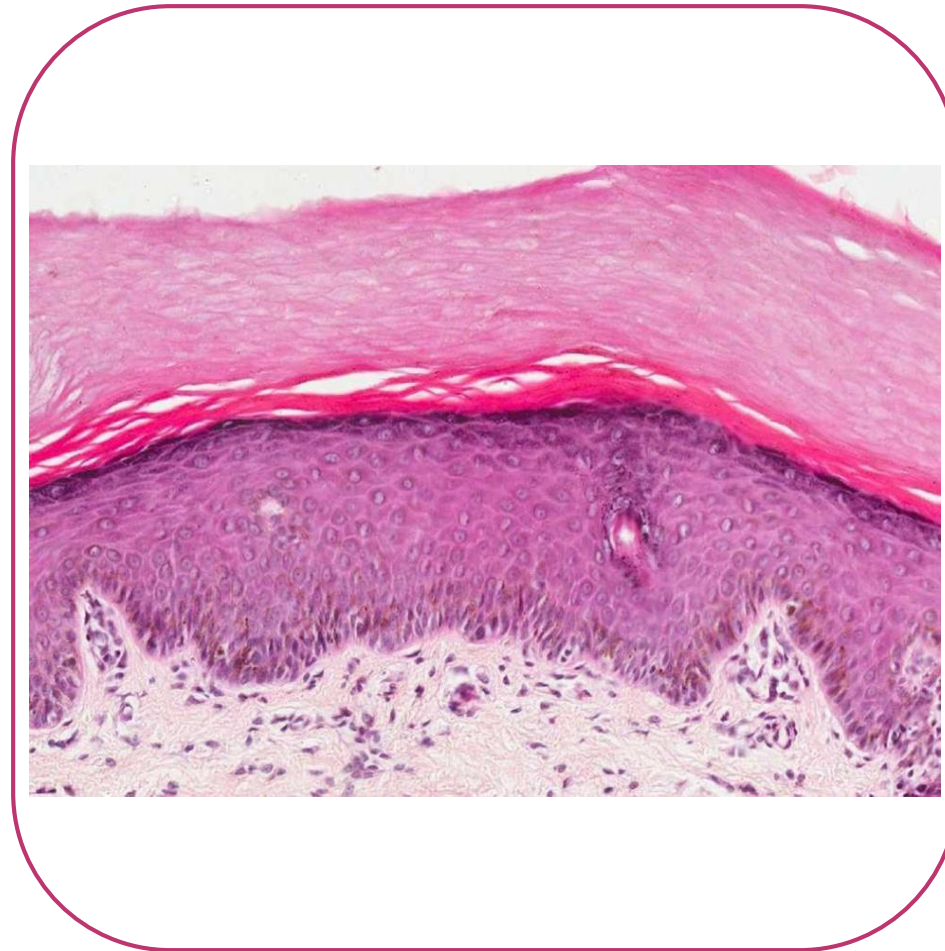
Stratified squamous keratinized epithelium

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



Stratified squamous epithelium non keratinized

Q1- Identify the type of epithelium?

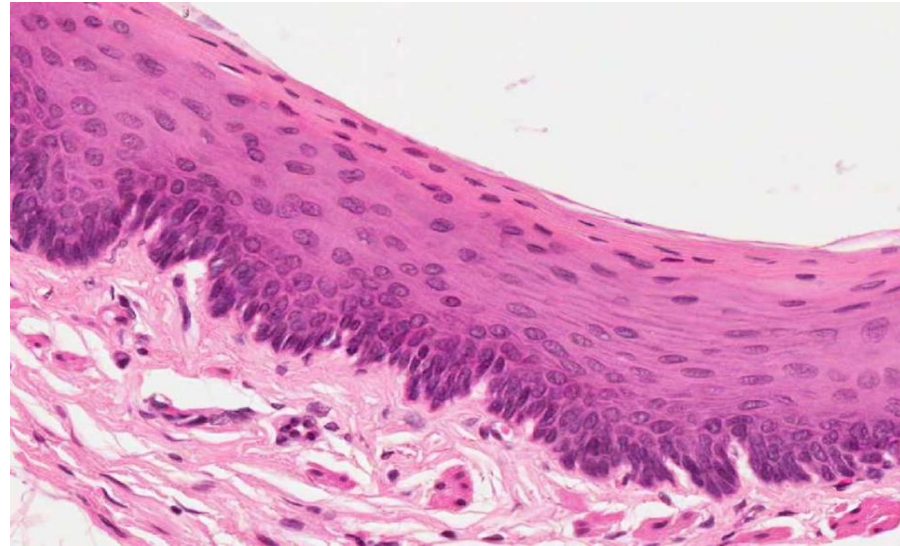
Stratified squamous non-keratinized epithelium

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



Transitional epithelium

Q1- Identify the type of epithelium?

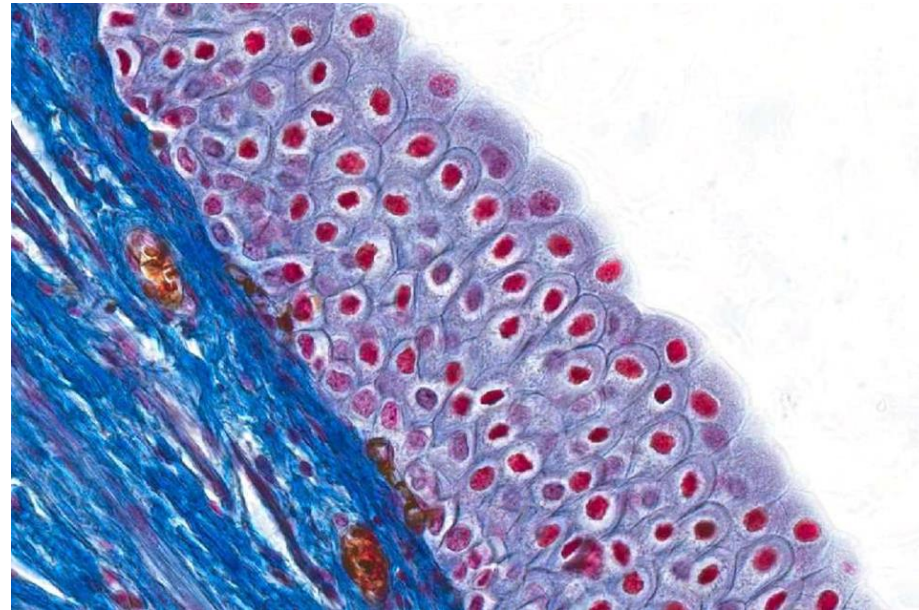
Transitional epithelium

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

Urinary bladder

Q3- What are Characteristics of it?

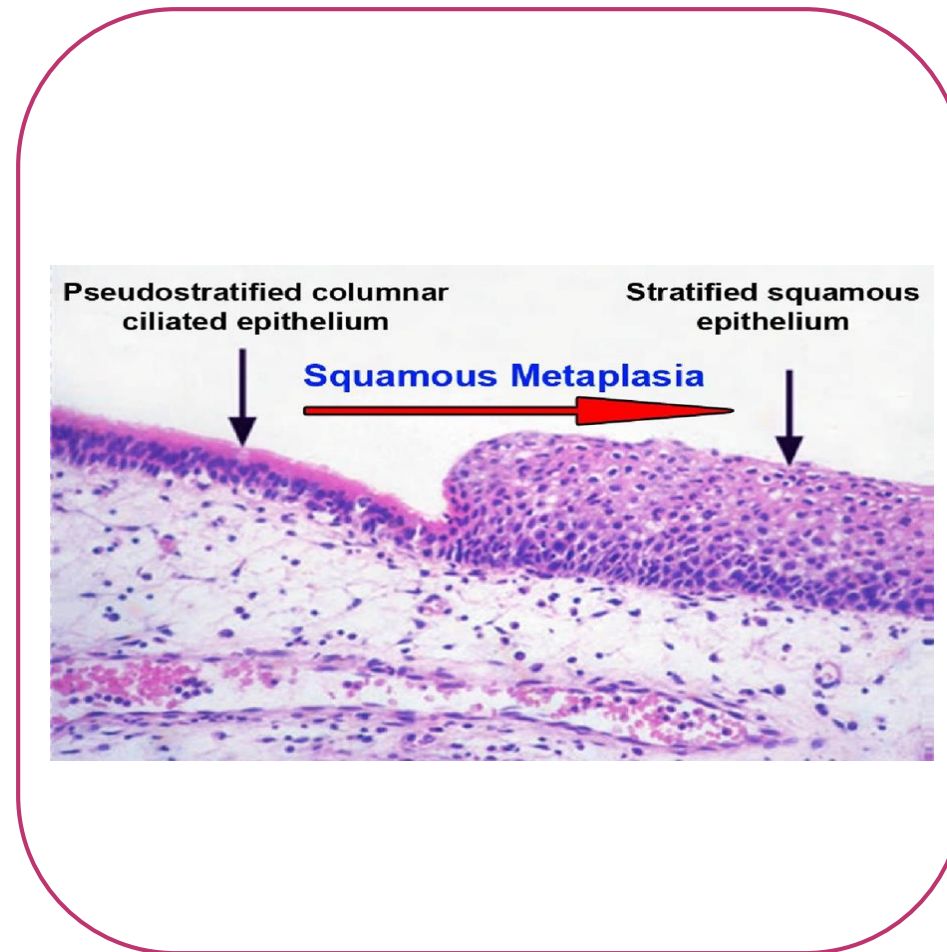
- multiple layers
- basal cells: columnar
- Intermediate cells: polygonal
- Surface cells: large cuboidal with convex free surface maybe binucleated
- With layer of keratin on the surface



*Not important but might be in pathology questions

Squamous metaplasia

- From pseudostratified columnar ciliated epithelium to stratified squamous epithelium
- In trachea
- Metaplasia: **change** from simple into stratified **squamous**



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?

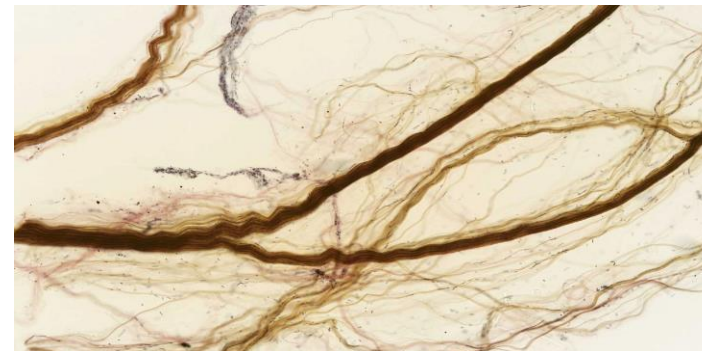
Collagen fiber (Collagen type I)

Q3- What is the type of cells?

Fibroblast cells

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

- Tendons
- ligaments

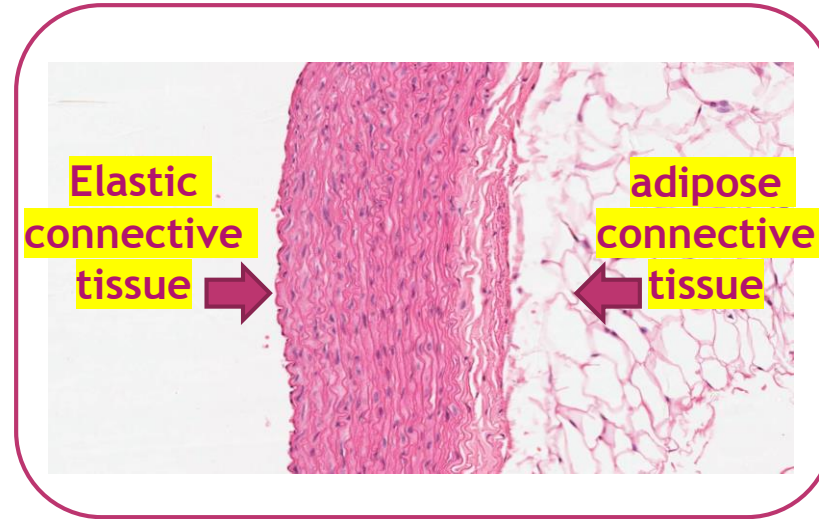


Elastic connective tissue

Q1- Identify the structure?
Elastic connective tissue

Q2- What is the type of cells?
Fibroblast cells

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



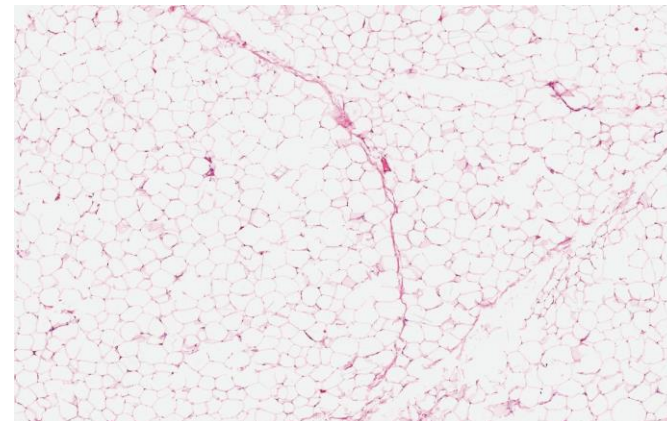
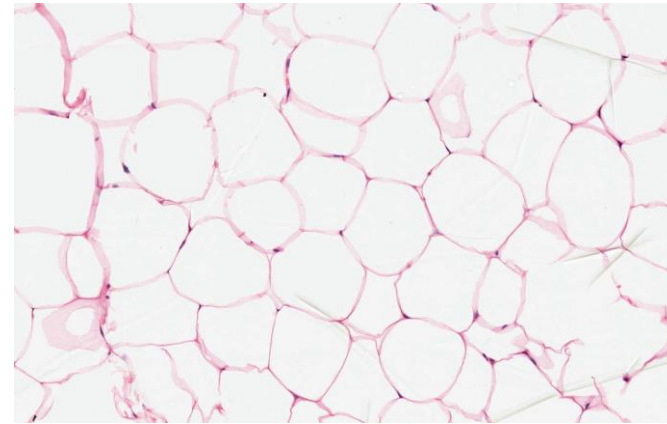
Adipose connective tissue

Q1- Identify the type of connective tissue?

Adipose connective tissue

Q2- What is the type of epithelium?

Adipocyte

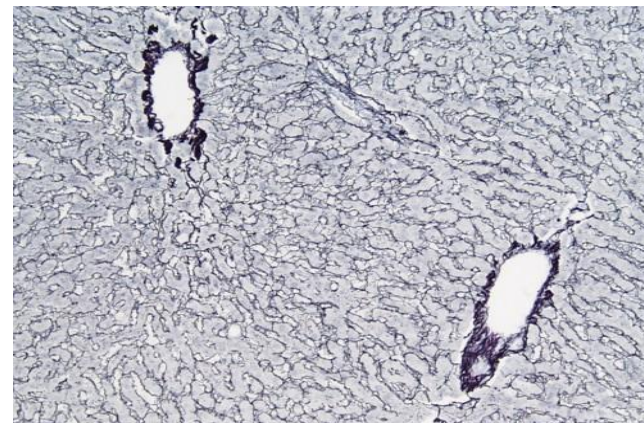
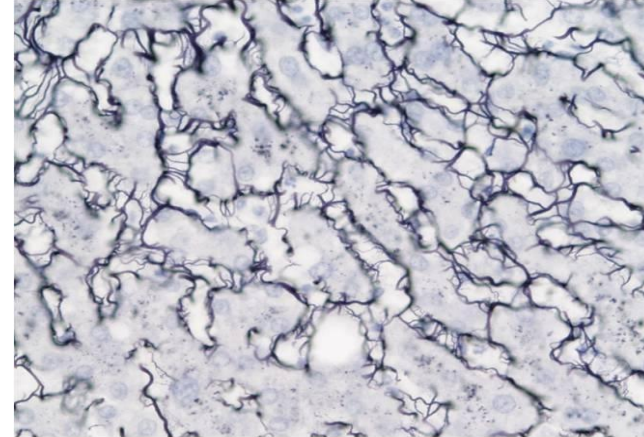


Reticular connective tissue

Q1- Identify the type of connective tissue?
Reticular connective tissue (**Collagen type III**)

Q2- mention the organ?

- Lymph node
- spleen

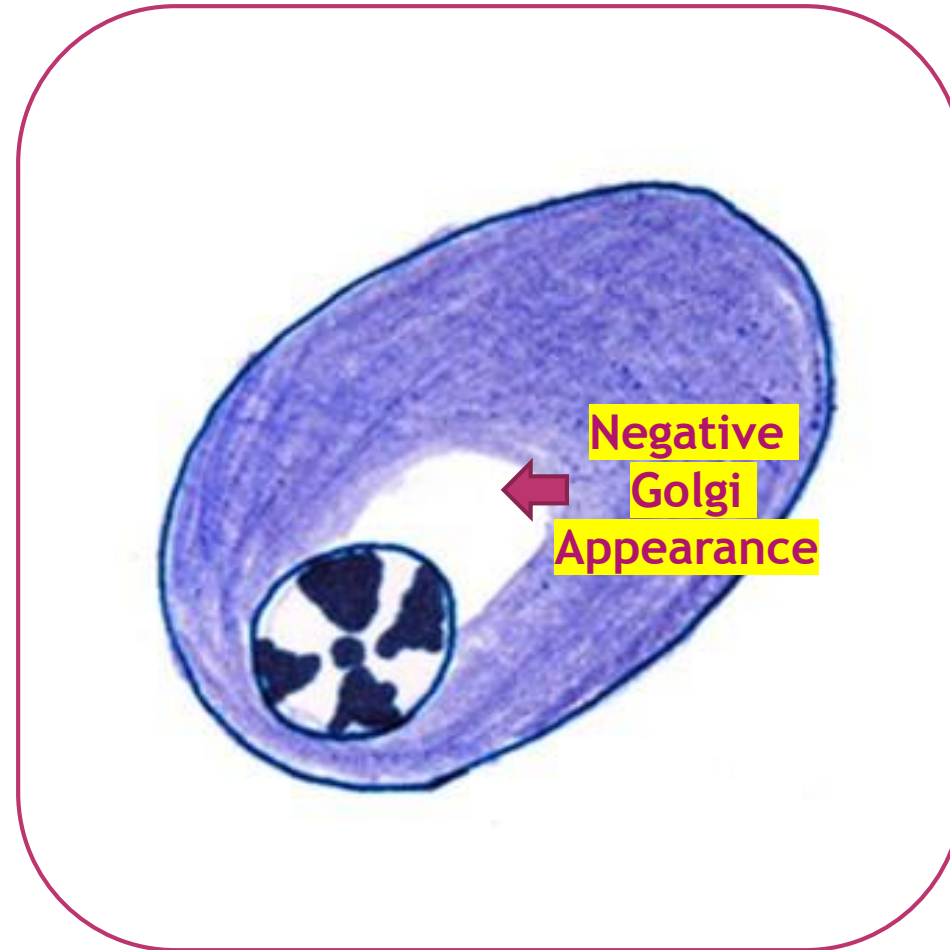


Plasma cell

Q1- Identify the type of the cell?
Plasma cell (clock-face **nucleus**)

Q2- What is the function of it?
Secretion of Antibodies

Q3- What is the type of cytoplasm?
Basophilic cytoplasm



Mast cell

Q1- Identify the type of the cell?

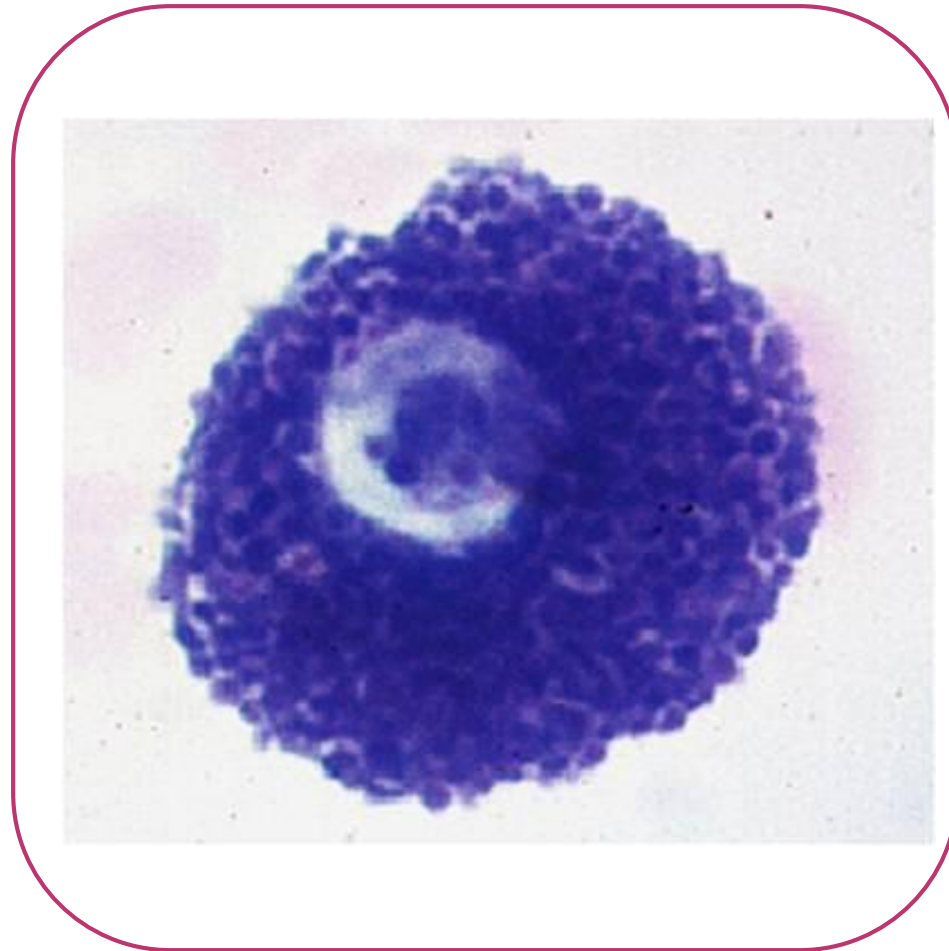
Mast cell

Q2- What is the function of it?

- Secretion of Histamine
- Secretion of heparin

Q3- What is the type of cytoplasm?

Basophilic cytoplasm-**coarse secretory granules**



LYMPHOID TISSUE

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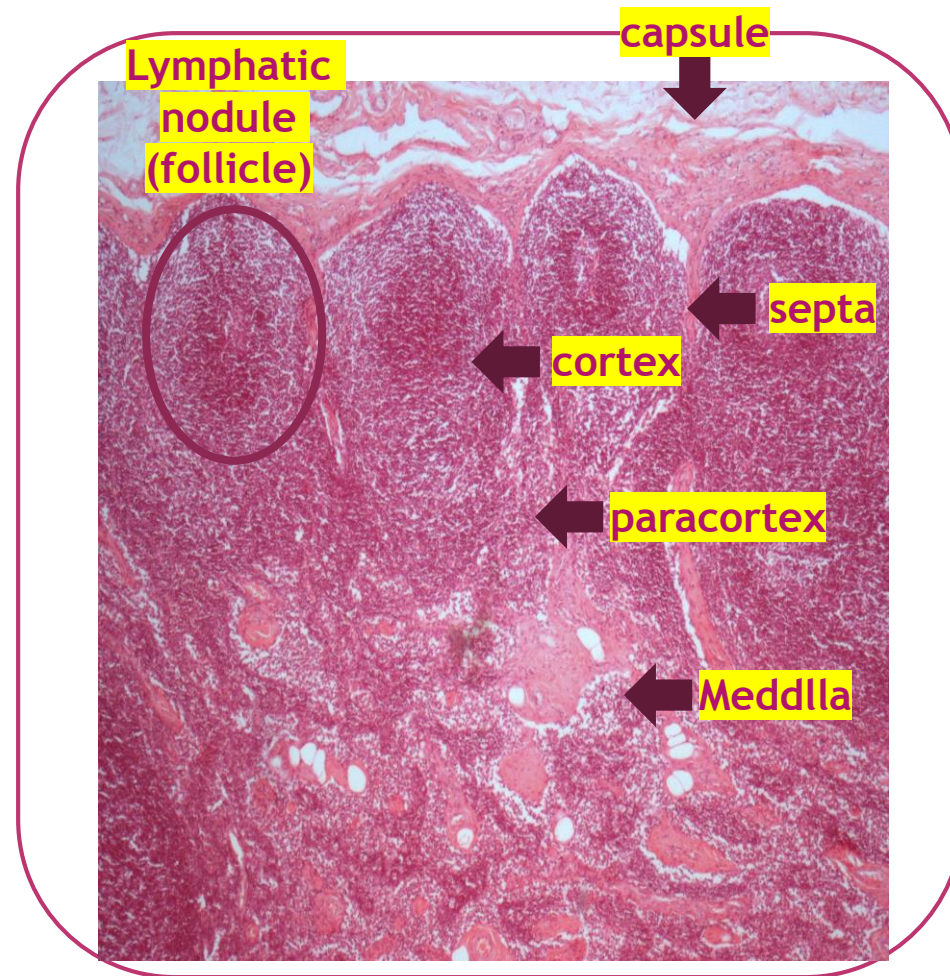
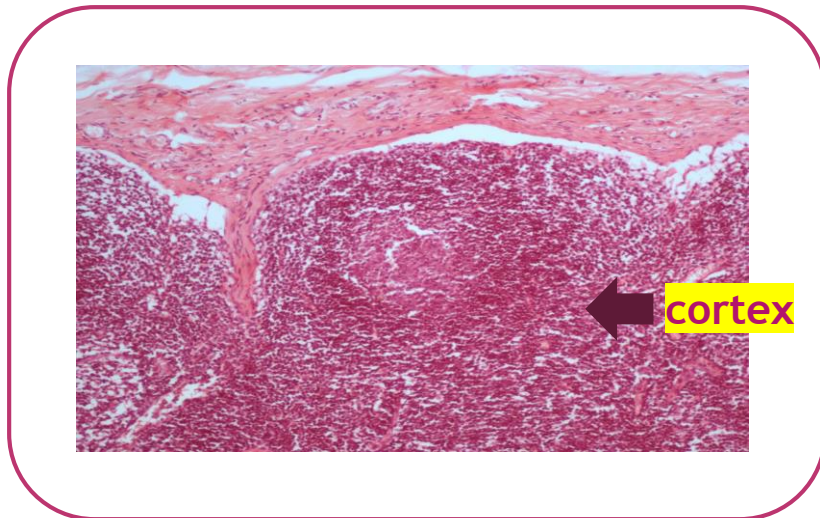


Lymph node

Q1- Identify the structure?
Lymph node

Q2- Show the structure of:

- Cortex (Has lymphatic nodules)
- Paracortex
- Medulla (rich in lymphatic sinuses)



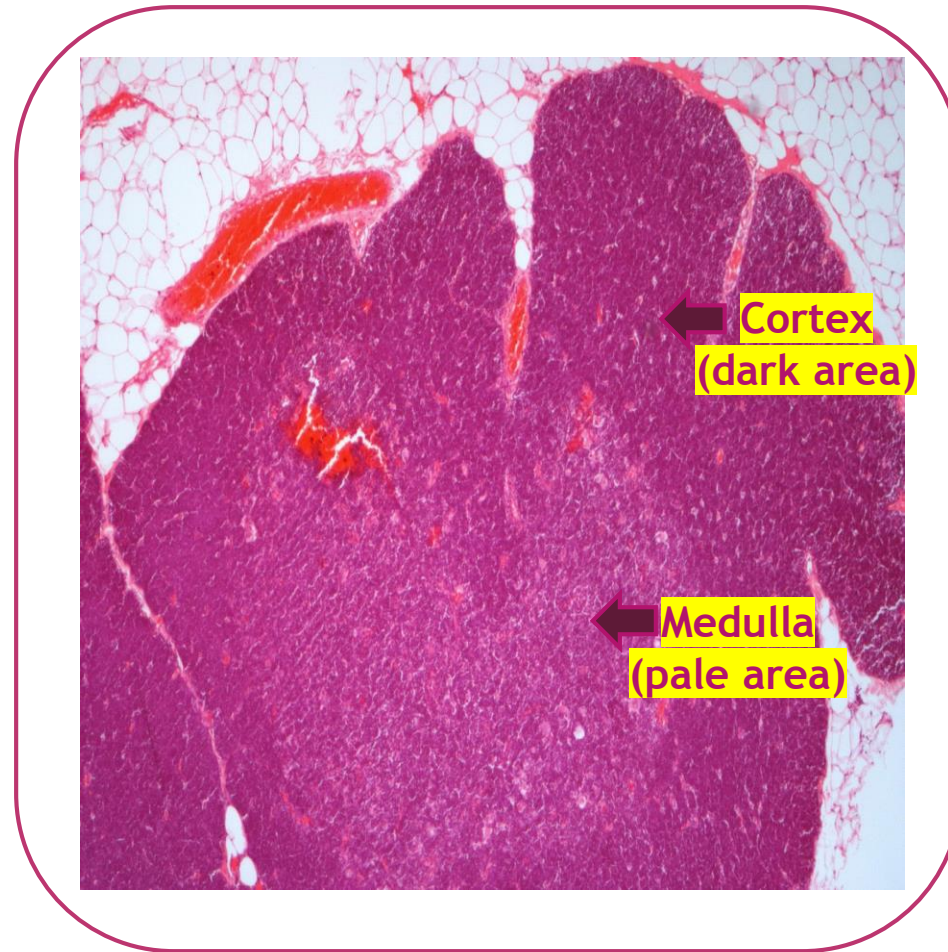
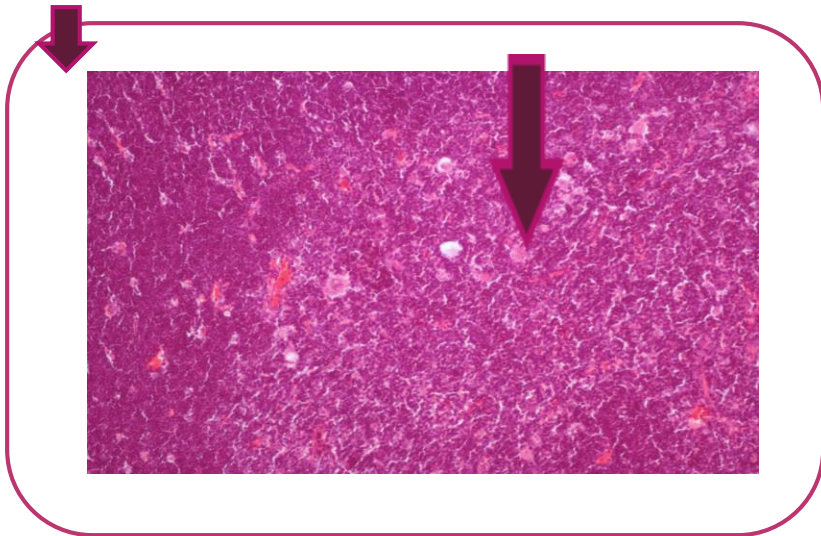
Thymus

Q1- Identify the structure?

Thymus (incomplete septum)

Q2- Show the structure of thymic lobule:

- Cortex
- Medulla (Hassall's corpuscles)



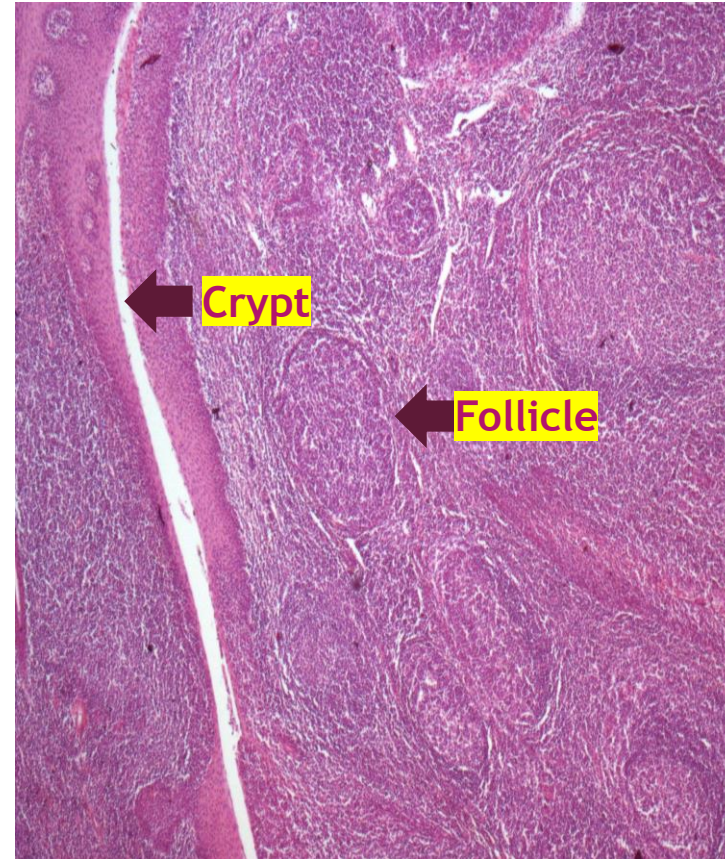
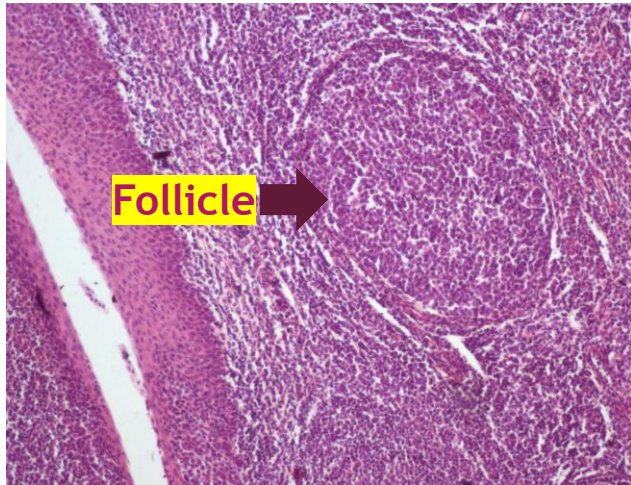
Palatine tonsil

Q1- Identify the structure?

Palatine tonsil (incomplete capsule)

Q2- What is the type of epithelium?

Stratified squamous epithelium



" لنكن يدأ بيد ليري العالم إنجازاتنا
وتحملوا شقاء اليوم لأجل حلم الغد "

Team leaders :
Rawan Mohammad Alharbi
Khalid Fayeز Alshehri



[Twitter.com/Histology437](https://twitter.com/Histology437)



HistologyTeam437@gmail.com



HISTOLOGY
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