



# HISTOLOGY

Practical (GI Tract + Liver, Pancreas, & Spleen)

**Done by:**

*Saleh Almansour &  
Bayan Al-Mugheerah*

**Reviewed by:**

*Nada Alouda &  
Faisal Alshuwair*

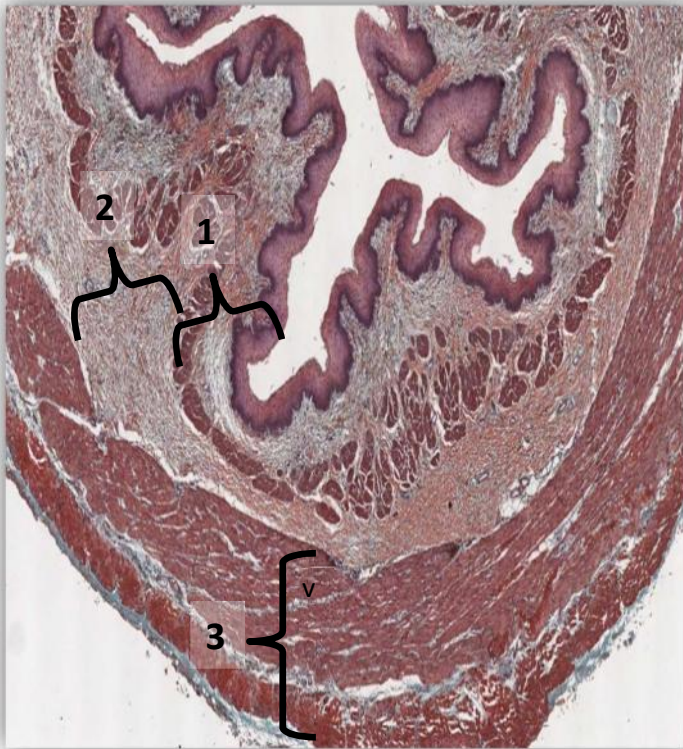


Doctor said "we will ask you to identify the organ, lining epithelium, cells and identify features". For the features he said you can say the general features. He also said the high power of any section is more important. We will focus on it.

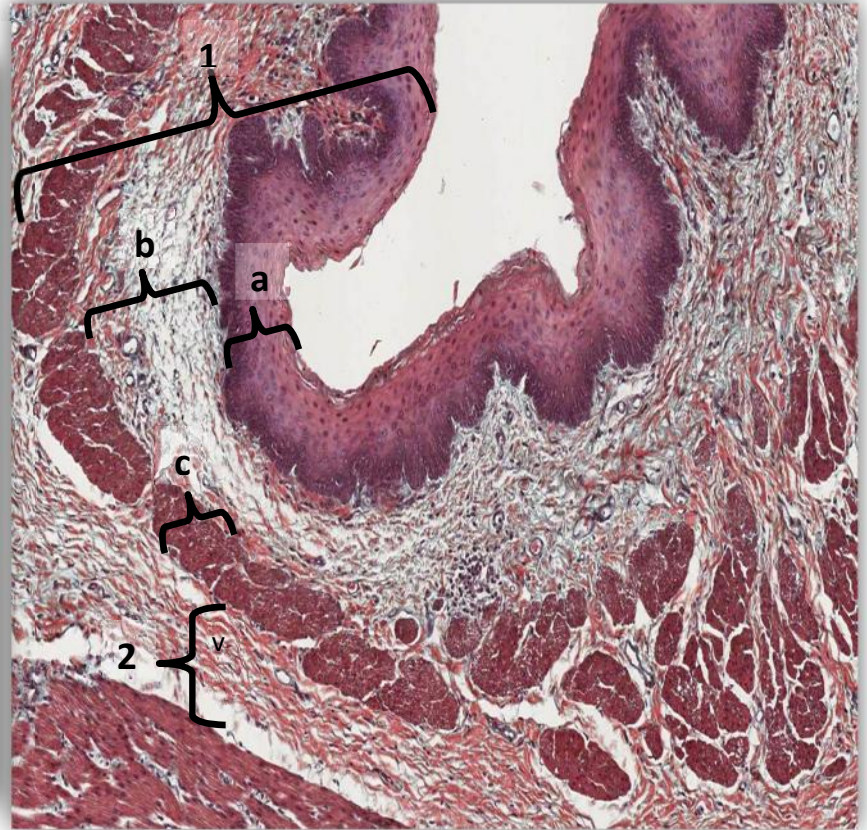
- The most important characteristic features are underlined & coloured in red.

**GI Tract Block – 432 Histology Team**

# Identify: Esophagus



Low power



High power (important)

## Enumerate the layers.

(There are 4 layers from inside to outside):

### 1- Mucosa:

- Epithelial Lining: **Non-Keratinized Stratified Squamous Epithelium.**
- Lamina propria: C.T.
- Muscularis mucosae.

### 2- Submucosa:

C.T containing blood vessels, *Meissner's plexus* (nerves) & **glands**.

### 3- Muscularis externa (**2 layers**):

- Inner circular layer.
  - *Auerbach's (myenteric) plexus*.
- Outer longitudinal layer.

### 4- Adventitia OR serosa:

- Serosa:** **only** in the abdominal part of the esophagus.
- Adventitia:** covers cervical & thoracic parts of esophagus.



## Identify: Fundus of stomach

### Enumerate the layers.

#### 1- Mucosa:

a) **Surface Epithelium:** simple columnar mucus-secreting cells.

b) **Fundic glands:**

★ - **Short** pits and **Simple** or branched tubular glands.

- It is rich in **parietal** (acidophilic; pink) & **chief cells** (basophilic; blue).

c) **Lamina propria:** C.T.

d) **Muscularis mucosae.**

#### 2- Submucosa:

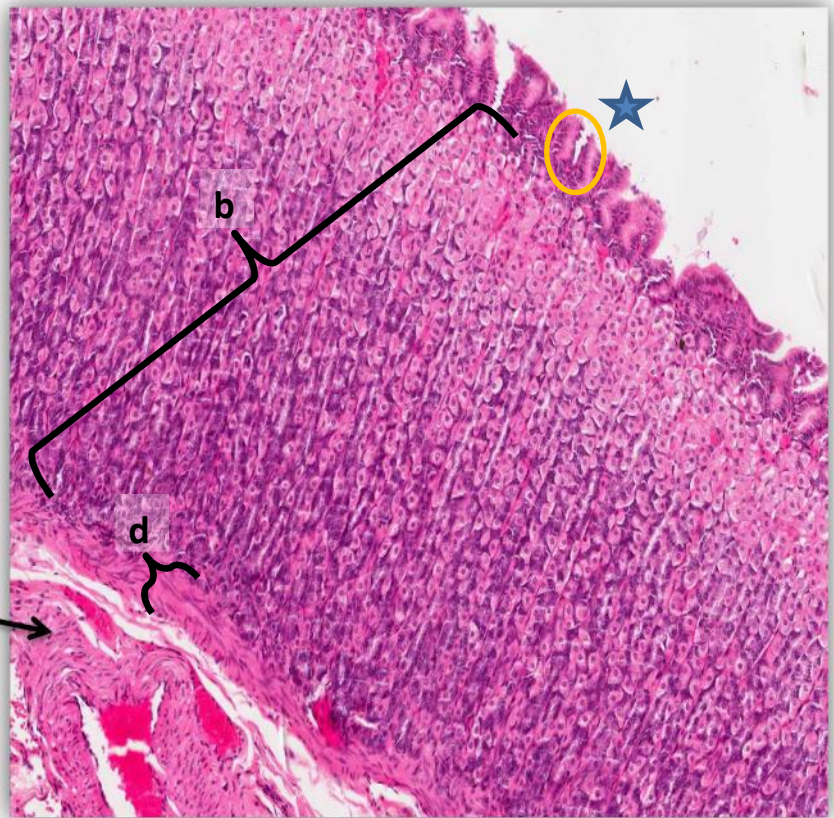
#### 3- Muscularis externa (**3 layers**):

a) Inner oblique.

b) Middle circular.

c) Outer longitudinal.

#### 4- Serosa: C.T. covered by mesothelium.



## Identify: Pylorus of the stomach

### Enumerate the layers.

#### 1- Mucosa:

a) **Surface Epithelium:** simple columnar mucus-secreting cells.

b) **Pyloric glands:**

★ **Deep** pits and **branched** tubular glands.

- It is rich in **mucus neck cells** (dark cells with red nuclei).

c) **Lamina propria:** C.T.

d) **Muscularis mucosae.**

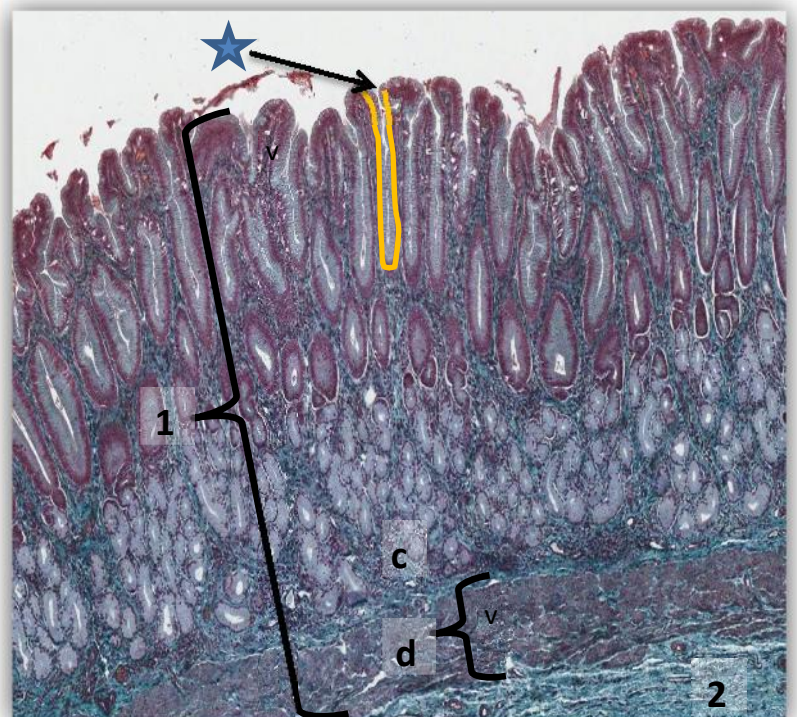
#### 2- Submucosa.

#### 3- Muscularis externa (**2 layers**):

d) Inner circular.

e) Outer longitudinal.

#### 4- Serosa: C.T. covered by mesothelium.





# Identify: Duodenum

## Enumerate the layers. ★ ★

1- Mucosa (shows intestinal villi & crypts):

- Epithelium:** simple columnar epithelium with goblet cells (absorptive & contain the brush borders).
- Lamina propria:** C.T.
- Muscularis mucosae.**

2- Submucosa:

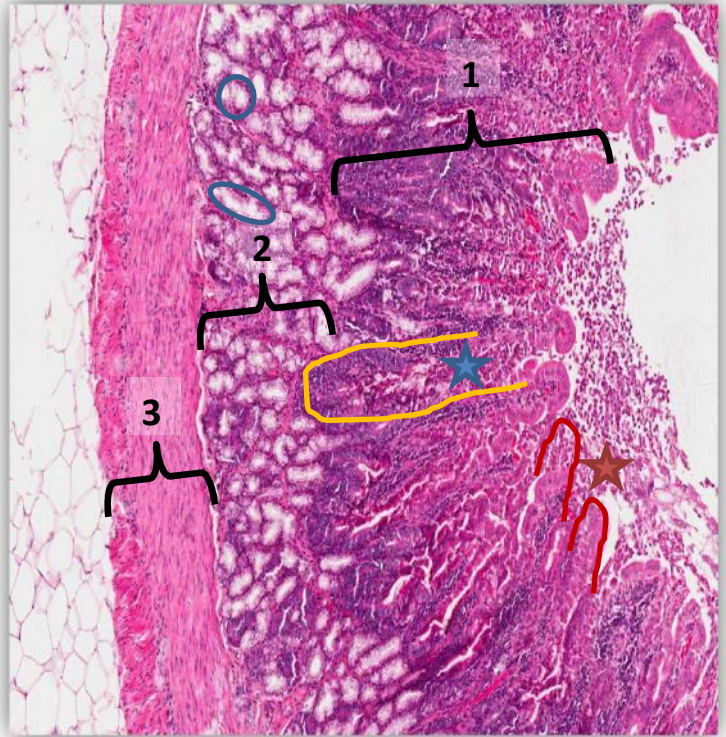
Contains **Brunner's glands** (secrete mucus). ○

3- Muscularis externa (**2 layers**):

- Inner circular.
- Outer longitudinal.

4- Serosa or adventitia:

Only the 2<sup>nd</sup> and 3<sup>rd</sup> parts are covered by adventitia. Upper part is covered by serosa (the doctor said the section usually will be from the upper part).



# Identify: Ileum

## Enumerate the layers. ★

1- Mucosa (shows intestinal villi & crypts):

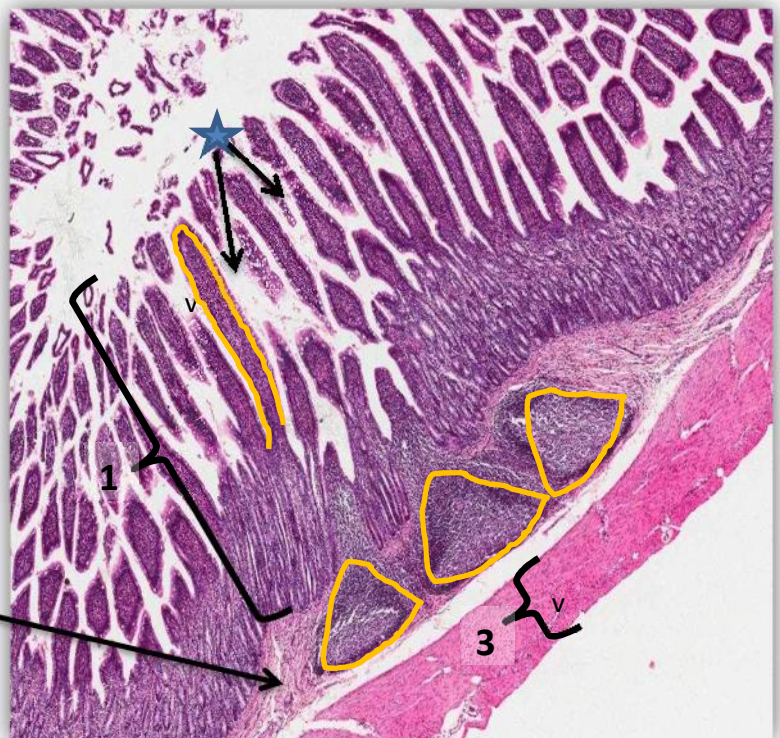
- Epithelium:** simple columnar epithelium with goblet cells (absorptive & contain the brush borders).
- Lamina propria:** Its lamina propria, opposite the attachment of the mesentery, has lymphoid nodules (**Peyer's patches**) that extend to the submucosa.  
Peyer's patches are found on one side.
- Muscularis mucosae.**

2- Submucosa.

3- Muscularis externa (**2 layers**):

- Inner circular.
- Outer longitudinal.

4- Serosa.





## Identify: Colon

### Enumerate the layers. ★

#### 1- Mucosa (shows only crypts):

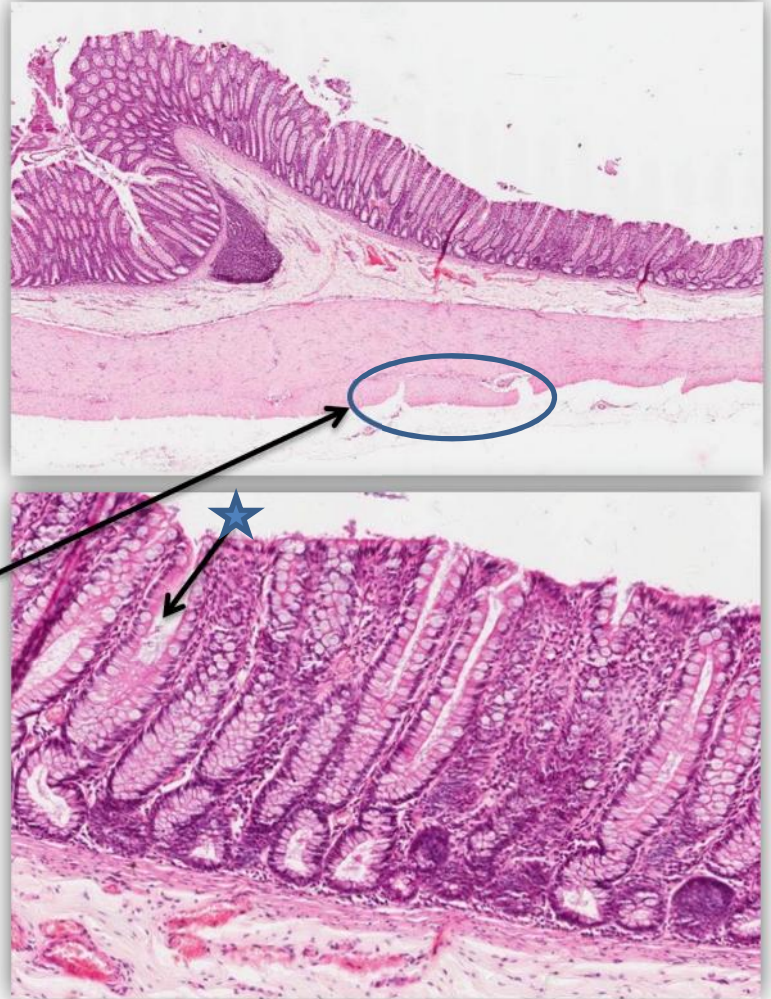
- Epithelium:** simple columnar epithelium with numerous goblet cells (secrete mucus).
- Lamina propria:**
  - **Lymphatic nodules** are frequent and solitary.
  - The cells covering the crypts are the same as in small intestine but **No Paneth cells.**
- Muscularis mucosae.**

#### 2- Submucosa (no glands).

#### 3- Muscularis externa (2 layers):

- Inner circular.
- Outer longitudinal (3 interrupted bands called teniae coli).

#### 4- Serosa: has fat-filled pouches called appendices epiploicae.



## Identify: Appendix

### Enumerate the layers.

#### 1- Mucosa (shows only shallow crypts):

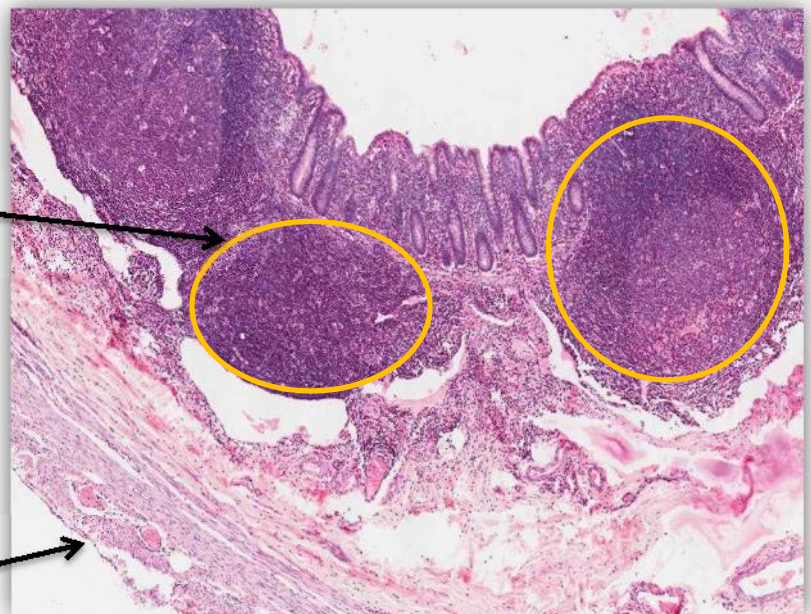
- Epithelium:** simple columnar epithelium with numerous goblet cells.
- Lamina propria:**
  - **More lymphatic nodules** are all around the circumference.
  - The cells covering the crypts are the same as in small intestine but **No Paneth cells.**
- Muscularis mucosae.**

#### 2- Submucosa (no glands).

#### 3- Muscularis externa (2 layers):

- Inner circular.
- Outer longitudinal

#### 4- Serosa.



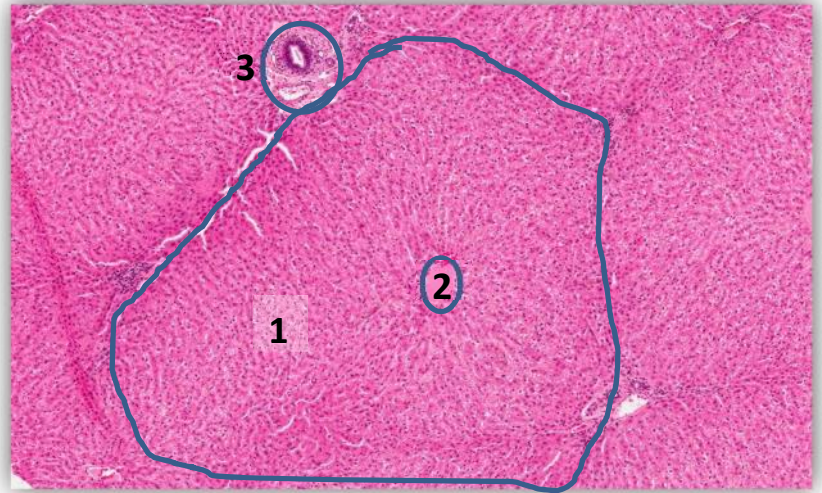


## Identify: Liver

Identify (1): Classic hepatic lobule.

Identify (2): Central vein.

Identify (3): Portal area.



## Identify: Portal area



### What are the components of portal area?

1. Bile duct.
2. Branch of portal vein.
3. Branch of hepatic artery.
4. C.T.

Some Cells found in liver :

Kupffer Cell (macrophage)  
Fat Storing Cells (Ito Cells)in Space of Disse  
Hepatocyt

## Identify: Gall bladder

### Enumerate the layers.

#### 1- Mucosa (highly folded):

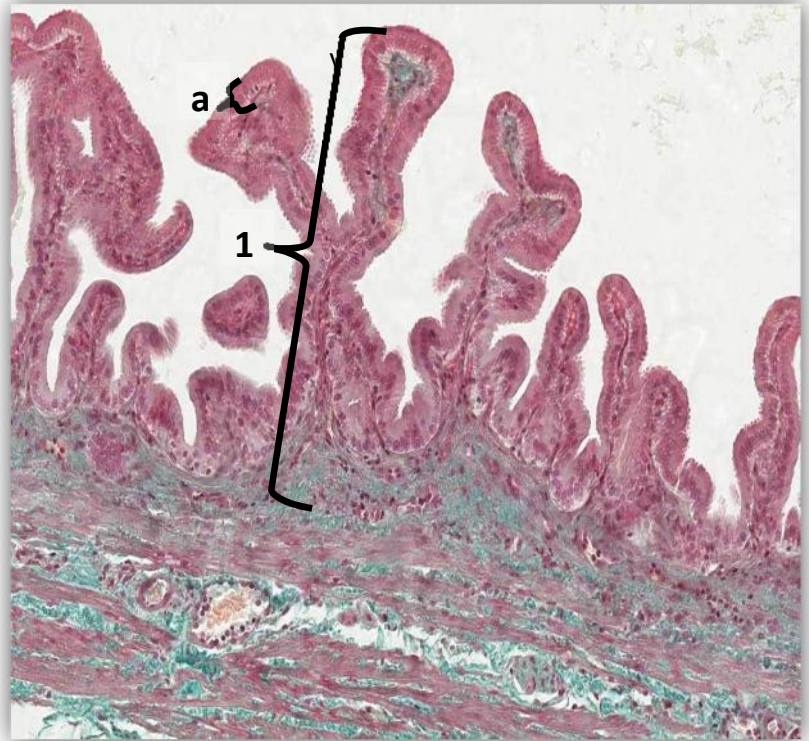
- **Epithelium:** simple columnar epithelium (no goblet cells).
- **Lamina propria:** It contains mucous glands in the neck of gall bladder

#### 2- Muscularis:

Bundles of smooth muscle fibers in all directions.

#### 3- Serosa or adventitia:

- **Adventitia:**  
This layer which attached to the liver.
- **Serosa:**  
In the unattached region (**Fundus** of gall bladder).



## Identify: Pancreas

Islets of Langerhans



Pancreatic acini

### Pancreatic Acinar Cells:

- Pyramidal in shape.
- Nuclei are basal.
- Cytoplasm:
  - Basal part basophilic due to abundant rER.
  - Apical part acidophilic due to secretory granules.



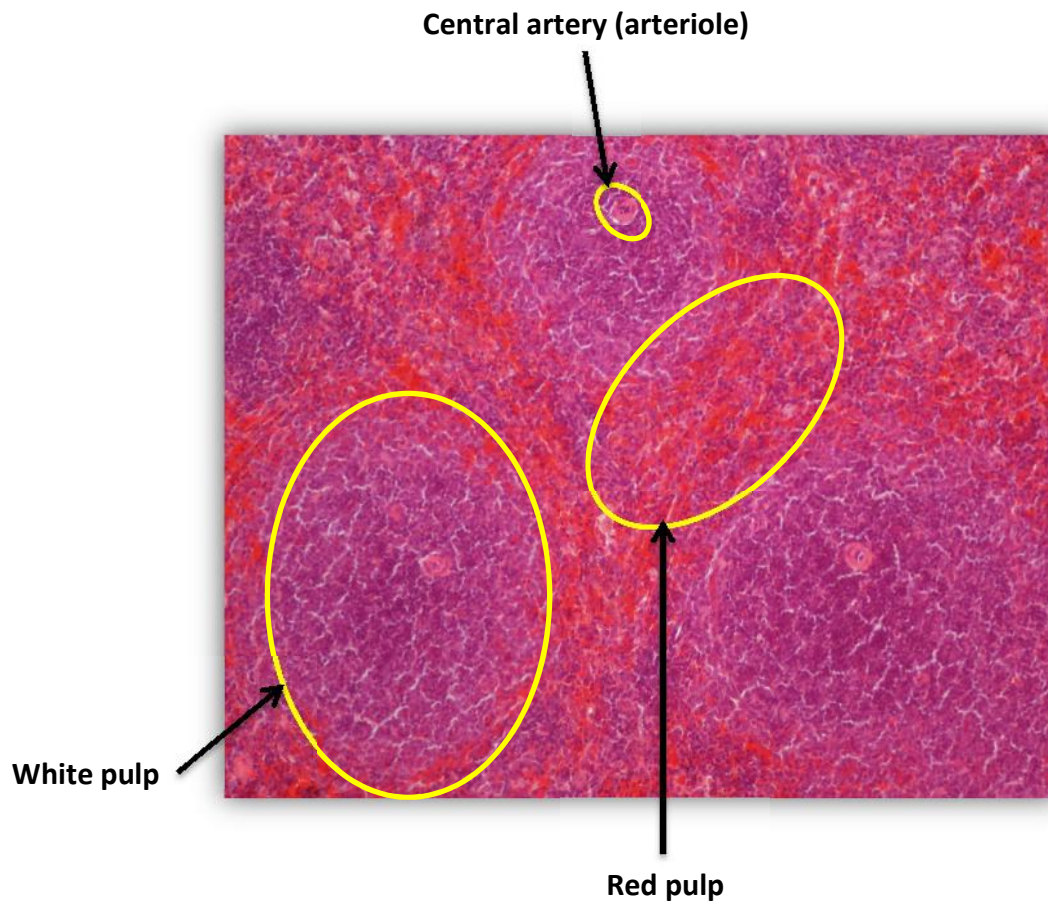
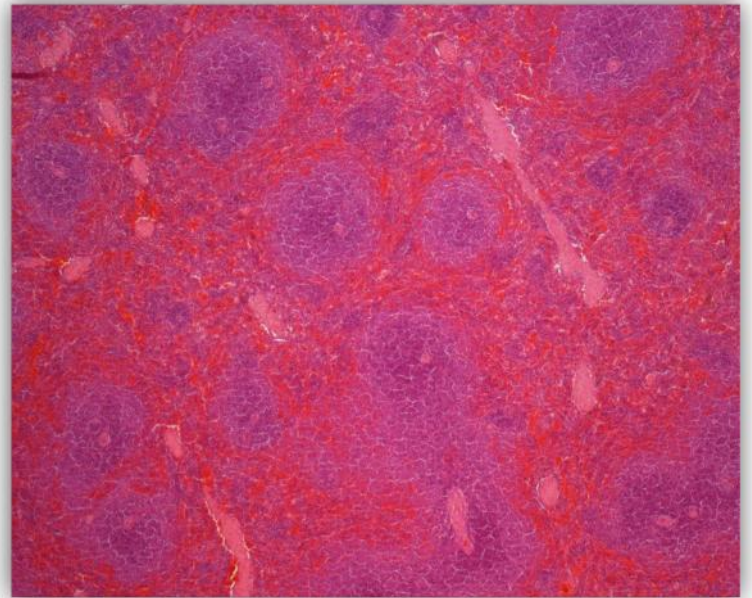
# Identify: Spleen

- **White pulp:**

1. **Periarterial lymphatic sheaths (PALS):** housing T lymphocytes.
2. **Lymphoid nodules with germinal centers:** housing B lymphocytes.  
**N.B.** both 1 & 2 have the **acentrically** located central artery (central arteriole).

- **Red pulp:**

1. **Pulp (splenic) cords:** extravasated blood cells, plasma cells, and macrophages.
2. **Blood sinusoids:** are lined with elongated fusiform endothelial cells with large intercellular spaces & supported by discontinuous, circular basement membrane.





# Intestinal villi & crypts

## \*Villi

Villus is a finger-like projection

### Cells Covering the Villi :

- Surface columnar absorptive cells
- Goblet cells
- Enteroendocrine cells
- M cells

## \*Crypts

Simple tubular glands that open between villi

Composed of 5 cell types:

1. Columnar absorptive cells
2. Goblet cells
3. Paneth cells
4. Enteroendocrine cells
5. Stem cells





**If you have any further questions please do not hesitate to contact us on: [432histologyteam@gmail.com](mailto:432histologyteam@gmail.com)**



**Histology Team Leaders:**

**Nada Alouda**

**Faisal Alshuwair**

***Best of luck!***