Alimentary Canal (I)
Esophagus & Stomach

Red: important.
Black: in male|female slides.
Gray: notes|extra.

Editing file

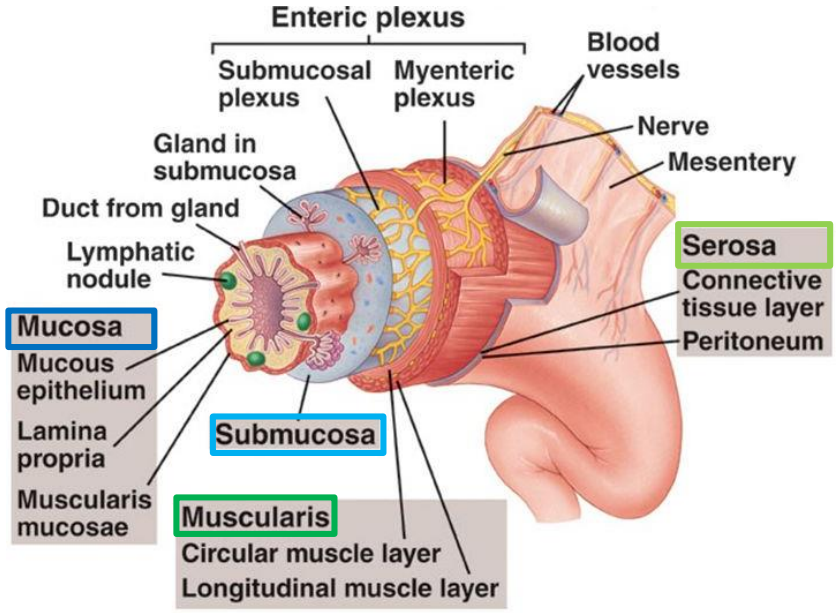
➢ OBJECTIVES

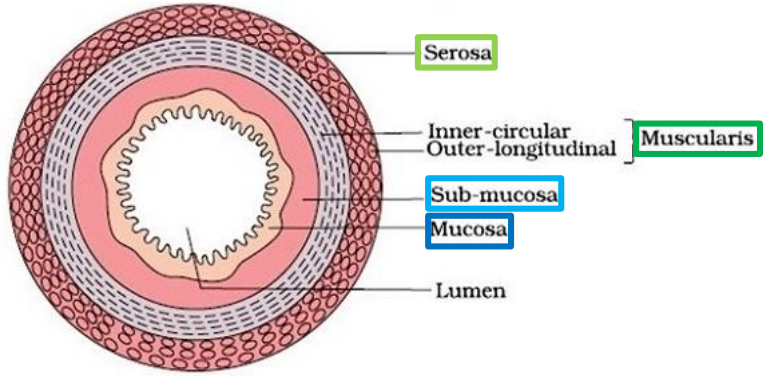
- Describe the microscopic structure & correlation with the function of the following organs:
- Neurons:
  - Esophagus
  - Stomach

➢ Alimentary Canal

- Is the **tubular portion** of digestive system.
- Is subdivided into: **esophagus**, **stomach**, **small intestine** (duodenum, jejunum & ileum), and **large intestine** (cecum, colon, rectum, canal & appendix).

- General Architecture of L/M Structure of Alimentary Canal:
  - **Mucosa.**
  - **Submucosa.**
  - **Muscularis externa.**
  - **Adventitia OR Serosa.**

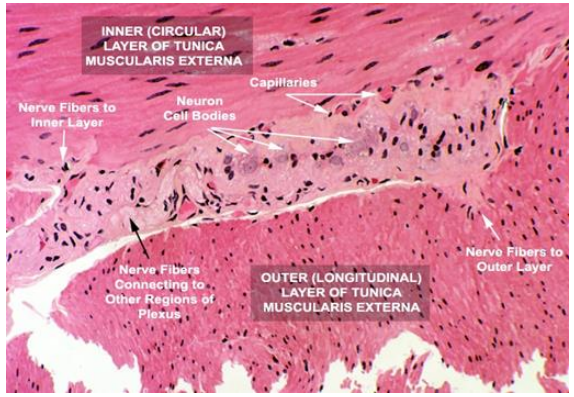




➢ Esophagus

Mucosa	• **Epithelial Lining:** Non-Keratinized Stratified Squamous Epithelium. • **Lamina propria:** Loose areolar C.T. with mucosal esophageal glands (secretion of mucus) in the upper and lower ends. • **Muscularis mucosae:** Few layers of smooth muscle fibers
Submucosa	• Loose areolar C.T. containing blood vessels, nerves & **submucosal esophageal glands** (secretion of mucus) • **Meissner's plexus** of nerve fibers and nerve cells
Muscularis Externa	• Two muscle layers: Inner circular layer & Outer longitudinal layer • **Upper 1/3**: both layers are **skeletal muscle** • **Middle 1/3**: **inner** layer is **smooth** muscle **& Outer** layer is **skeletal muscle** • **Lower 1/3**: both layers are **smooth muscle** • **Auerbach's (myenteric) plexus** in between the 2 layers
Serosa or Adventitia	• **Adventitia**: is loose areolar C.T. not covered by mesothelium • **Serosa**: is loose areolar C.T. covered by mesothelium (simple squamous epithelium) in the abdominal part of the esophagus

*Any organ cover by peritoneum it has serosa
*Adventitia + mesothelium = serosa
*Any question of esophagus without determine which part, that means thoracic esophagus



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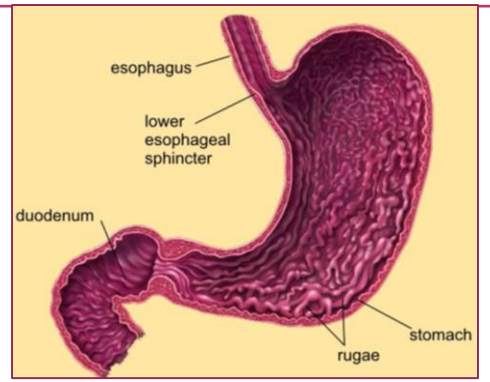
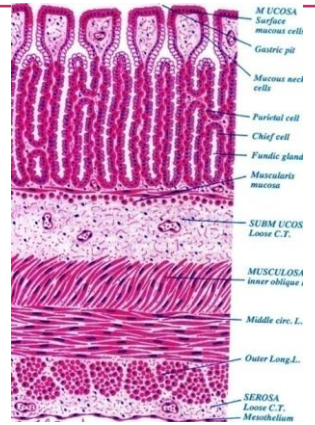
➢ Stomach

- It has 4 regions: **cardia**, **fundus**, **body** & **pylorus**
- Mucosa has folds, known as rugae* that disappear in the distended stomach
- Not has goblet cells *Stomach folds (rugae) are longitudinal & irregular

Mucosa	• Is **invaded** by **fundic glands (in fundus & body) | pyloric glands (in pylorus)** • **The surface epithelium of the mucosa is simple columnar mucus-secreting cell** • Lamina propria: C.T. invaded by **numerous fundic glands** with **lymphoid elements** • Muscularis mucosae: 2 layers of smooth muscle fibers
Submucosa	• **Connective tissue** containing **blood vessels**, **nerves**, and **Meissner's plexus** • **NO glands**
Muscularis Externa	• **3 smooth muscle layers: Inner oblique, middle circular & Outer longitudinal (in fundus & body)** • **2 muscle layers: Inner circular & Outer longitudinal (in pylorus)** • **Auerbach's (myenteric) plexus**
Serosa or Adventitia	• **C.T. covered by mesothelium**

- Purple ONLY in Fundus





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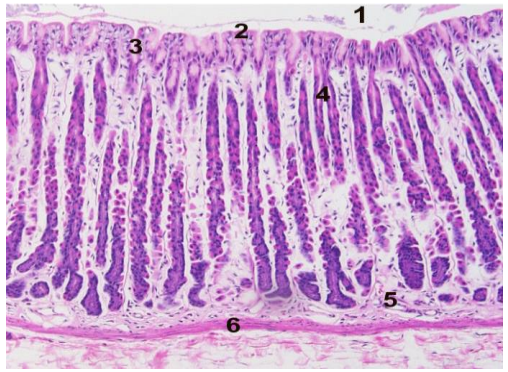
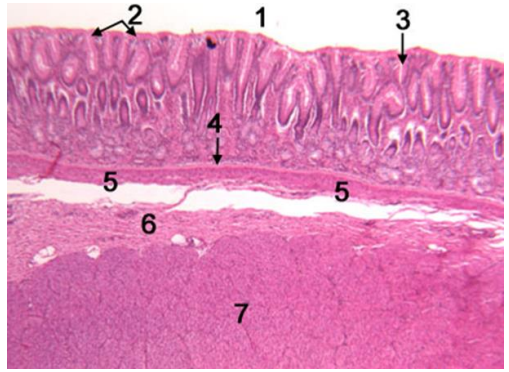
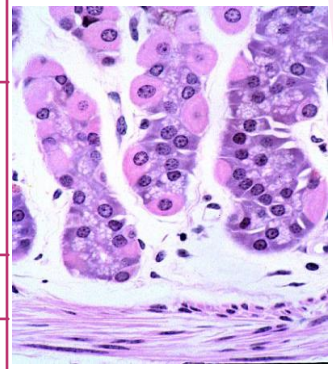
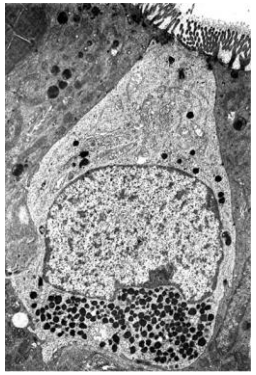
Fundus of Stomach	Pylorus of Stomach
	
1. Lumen 2. Surface columnar epithelium 3. Pits of fundic glands 4. Fundic glands 5. Lamina propria 6. Muscularis mucosae	1. Lumen 2. Surface epithelium 3. Pits of pyloric glands 4. Lamina propria 5. Muscularis mucosae 6. Submucosa 7. Muscularis externa

➢ Fundic Glands

Characteristics	• **Short pits: one fourth of mucosa** • **Simple branched tubular glands** • **Are rich in parietal & chief cells**
Parietal (oxyntic) cells	• **Shape: pyramidal** or **polygonal** • **Nucleus: central, round** • **Cytoplasm**: deeply **acidophilic**, **rich in SER**, **mitochondria** (40% of the cell volume) & **C-shaped intracellular canaliculus** • **Secrete: HCl & gastric intrinsic factor** that helps **absorption of vitamin B12**
Peptic (chief) cells	• **The predominant cell type** • **Columnar cells** • **Nucleus: basal, round** • **Cytoplasm: basophilic** with **apical secretory granules & secrete pepsinogen**
Mucous neck cells*	• **Secrete mucus** | *(mucus secreting cells)
EE (Enteroendocrine) cells & (DNES) cells	• Enterochromaffin (EC) cells: **secrete hormones** (e.g serotonin, endorphin)
Stem cells	• **Regenerative Cells** (regeneration occur every 4 days)





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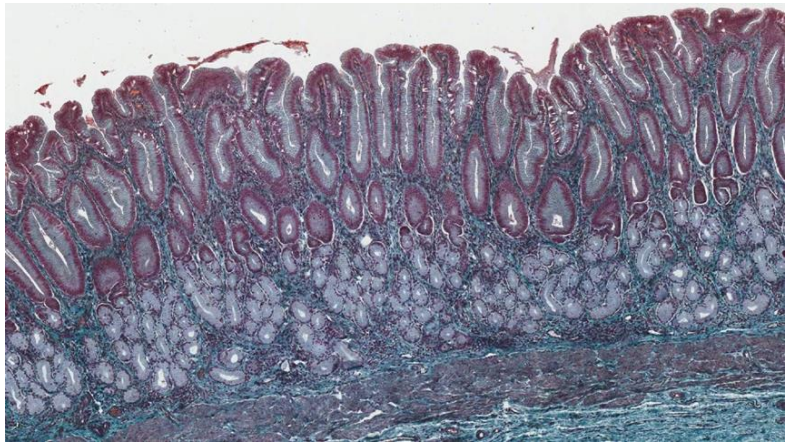
➢ Pyloric Glands

Characteristics	• **Their pits are deep about half the length of mucosa** • **They are branched and convoluted many cross sections**
Parietal (oxyntic) cells	• Few
Peptic (chief) cells	• **NOT have**
Mucous neck cells (mucus secreting cells)	• The predominant cells • Secrete mucus
Enteroendocrine (EE) cells	• EC cells • G cells • D cells • A cells
Stem cells	• **NOT have**

*REMEMBER!
Pits of Fundic Glands → ¼ of mucosa
Pits of Pyloric Glands → ½ of mucosa



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➢ QUESTIONS:

Q1: Which type of **esophageal mucosa (epithelial lining)?**

a) Stratified squamous epithelium b) Simple squamous epithelium

c) keratinized stratified squamous epithelium d) Non keratinized stratified squamous epithelium

Q2: Which of the following cells may **have cilia**?

a) Astrocytes b) Ependyma c) Microglia d) Oligodendrocytes

Q3: How many **Muscularis externa layers** in **fundus of stomach**?

a) Three b) Four c) Two d) One

Q4: How many **Muscularis externa layers** in **pylorus of stomach**?

a) Four b) Three c) Two d) One

Q5: Witch of the following cells have **acidophilic cytoplasm**?

a) Oxyntic cells b) Peptic cells c) Enteroendocrine(EE)(DNES) cells d) Mucous neck cells

1- D
2- B
3- A
4- C
5- A

Q6: Which of the following cells can **secrete pepsinogen**?

a) Oxyntic cells b) Peptic cells c) Enteroendocrine(EE)(DNES) cells d) Mucous neck cells

Q7: Which of the following cells have **basophilic cytoplasm**?

a) Oxyntic cells b) Peptic cells c) Enteroendocrine(EE)(DNES) cells d) Mucous neck cells

Q8: The **submucosa** of the **pylorus** contains all of the following **EXCEPT**?

a) Blood vessels b) Nerves c) Glands d) Meissner's plexus

Q9: The **predominant cells** of the **pyloric glands** are?

a) EE cells b) Mucous neck cells c) Stem cells d) Peptic cells

Q10: All of the following are **cells** of the **pyloric** glands **EXCEPT**?

a) EE cells b) Mucous neck cells c) Stem cells d) Peptic cells

6- B
7- B
8- C
9- B
10- D

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