

Introduction to GIT

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Digestive System

Digestive System Is formed of:

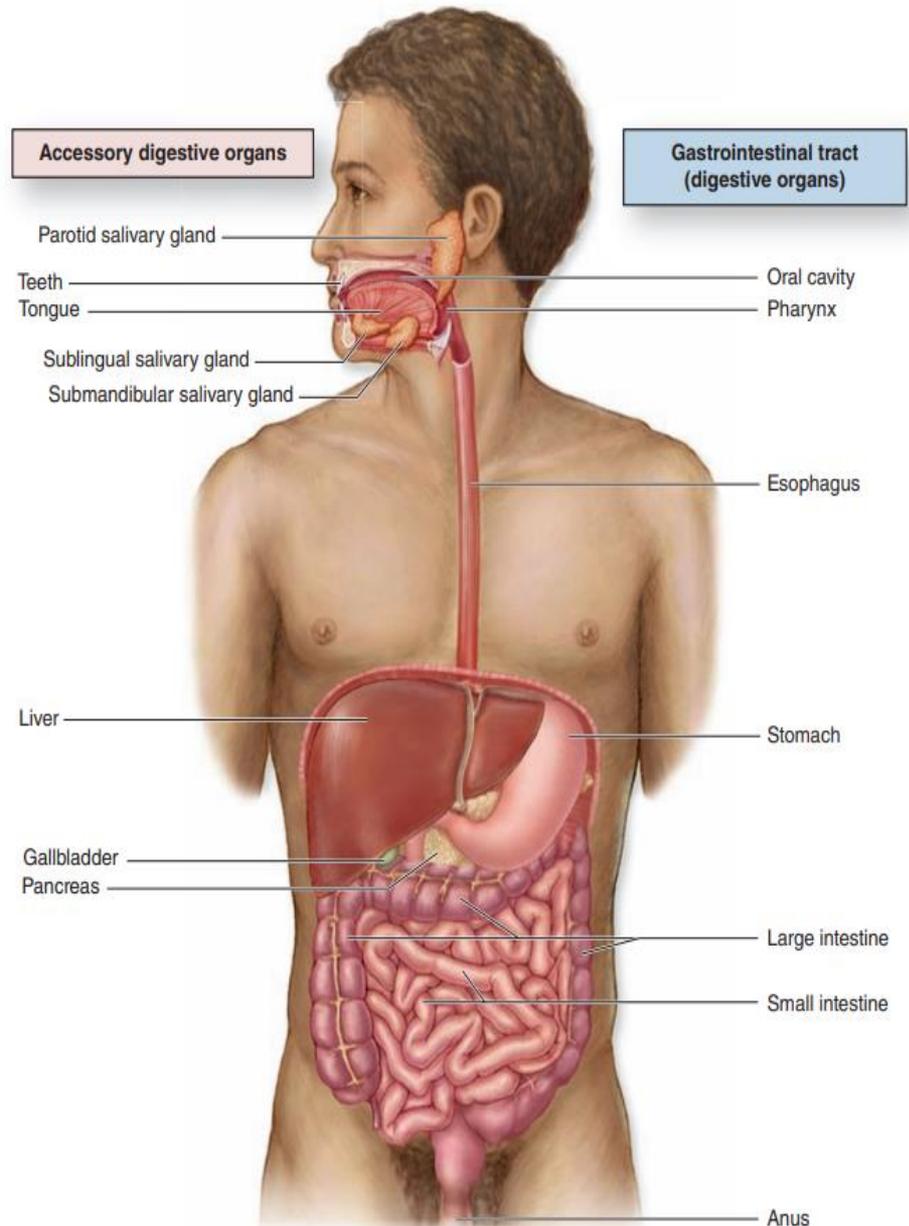
A-Alimentary tract (GIT):

It includes the following:

- The mouth cavity
- The pharynx
- The oesophagus
- The stomach
- The small intestine
- The large intestine → Anus

B-Glands of Digestive System:

- It includes the following:
- The salivary gland
 - The liver
 - The pancreas



The Mouth (oral) cavity

- It is the entrance to the digestive tract.

It contains

- tongue

- gingiva and teeth

- lips.

- Major and minor salivary glands open into the mouth cavity by different ducts.

- Oral cavity is lined by oral mucous membrane which is formed of:

1. Non-keratinized stratified squamous **epithelium**.

2. Lamina propria: formed of loose **connective tissue**

The tongue

- The tongue is the largest organ in the oral cavity.
- It is formed of a core of skeletal muscle covered with mucosa .
- It has dorsal and ventral surfaces .

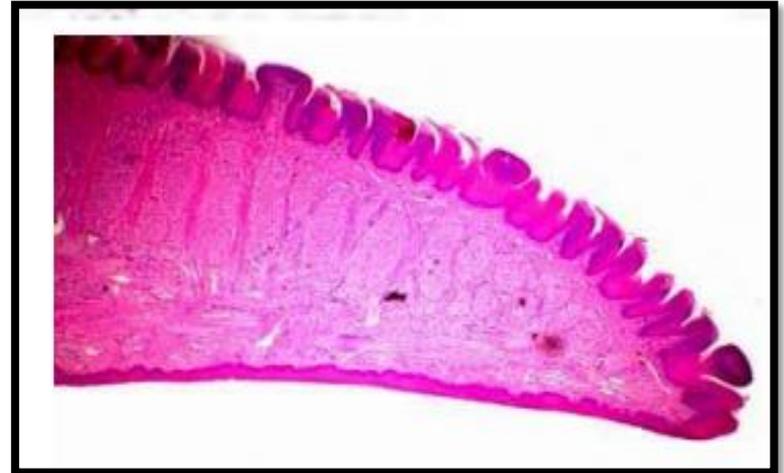
1– The ventral surface:

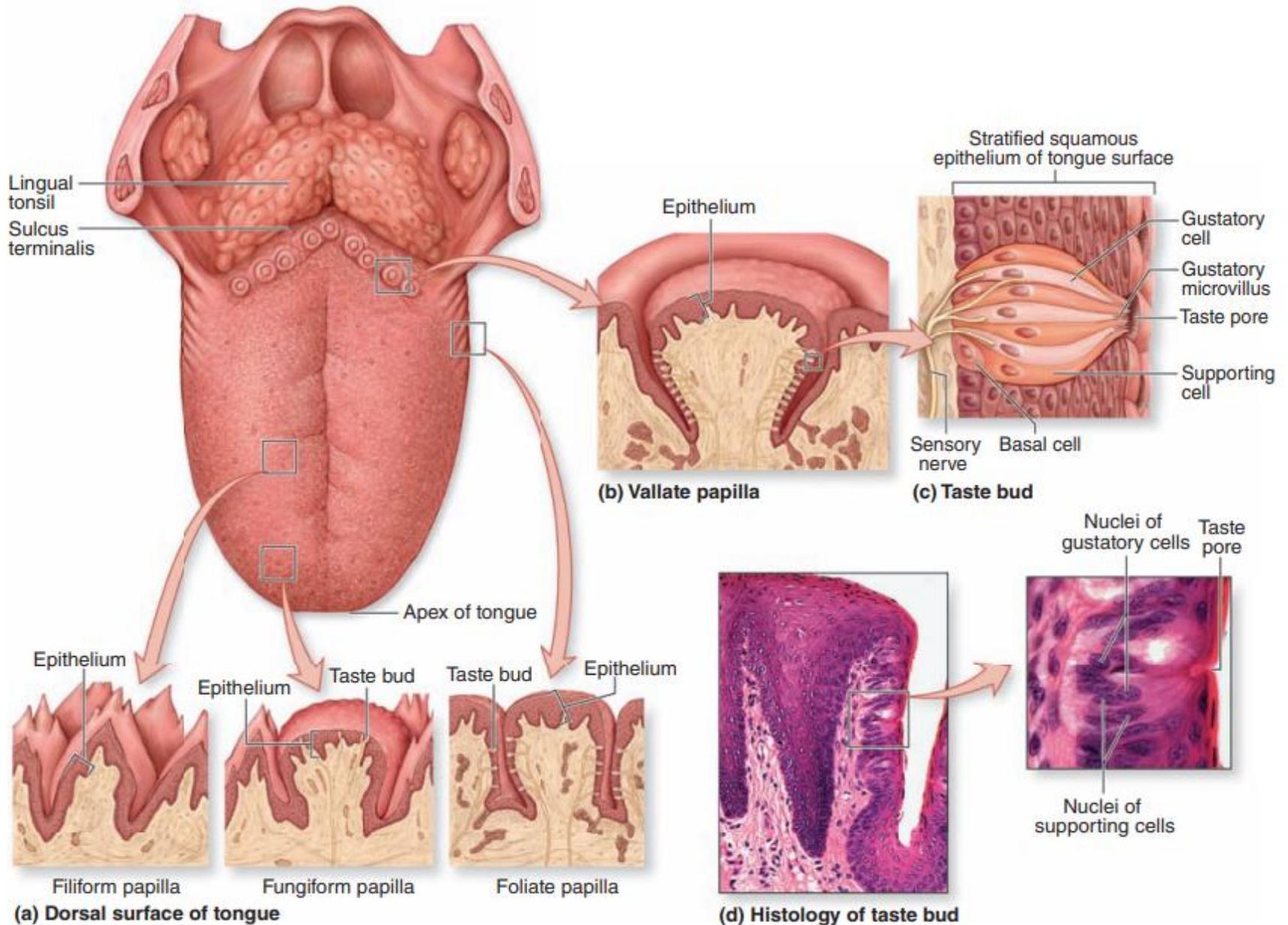
-It is covered by non keratinized stratified squamous epithelium rest on C.T.

2– The dorsal surface:

- It has v-shaped groove (**sulcus terminalis**) which divides the dorsal surface into an anterior 2/3 and posterior 1/3.

- In the anterior 2/3, the mucosa forms a great number of elevations called lingual papillae (contains **taste buds**)



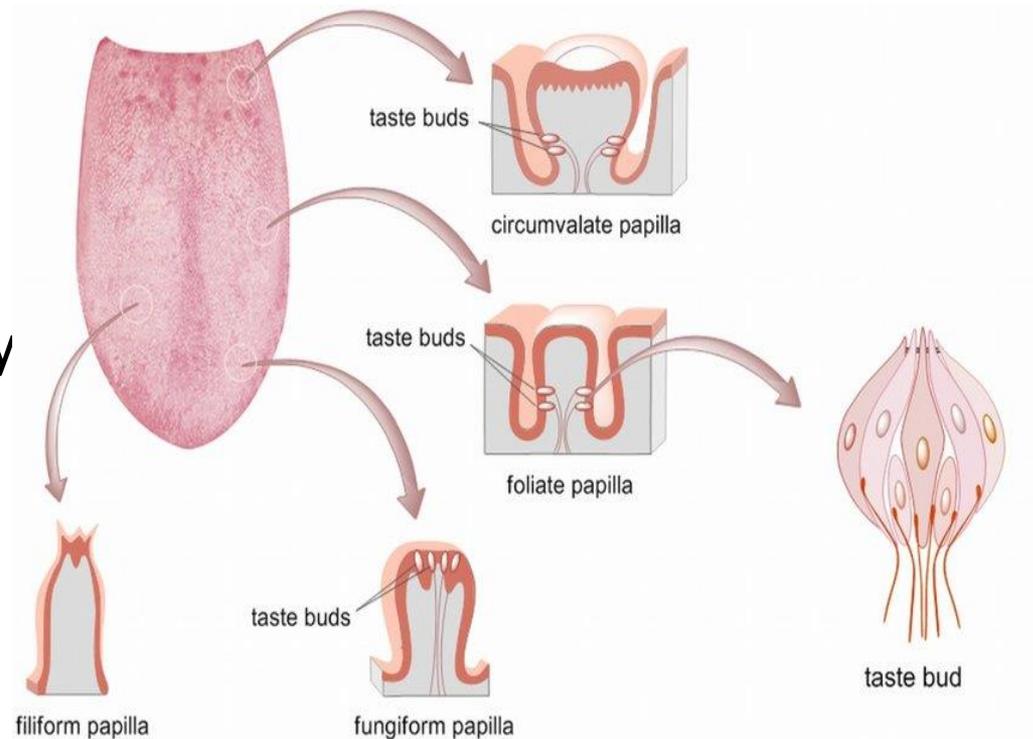


Lingual papillae

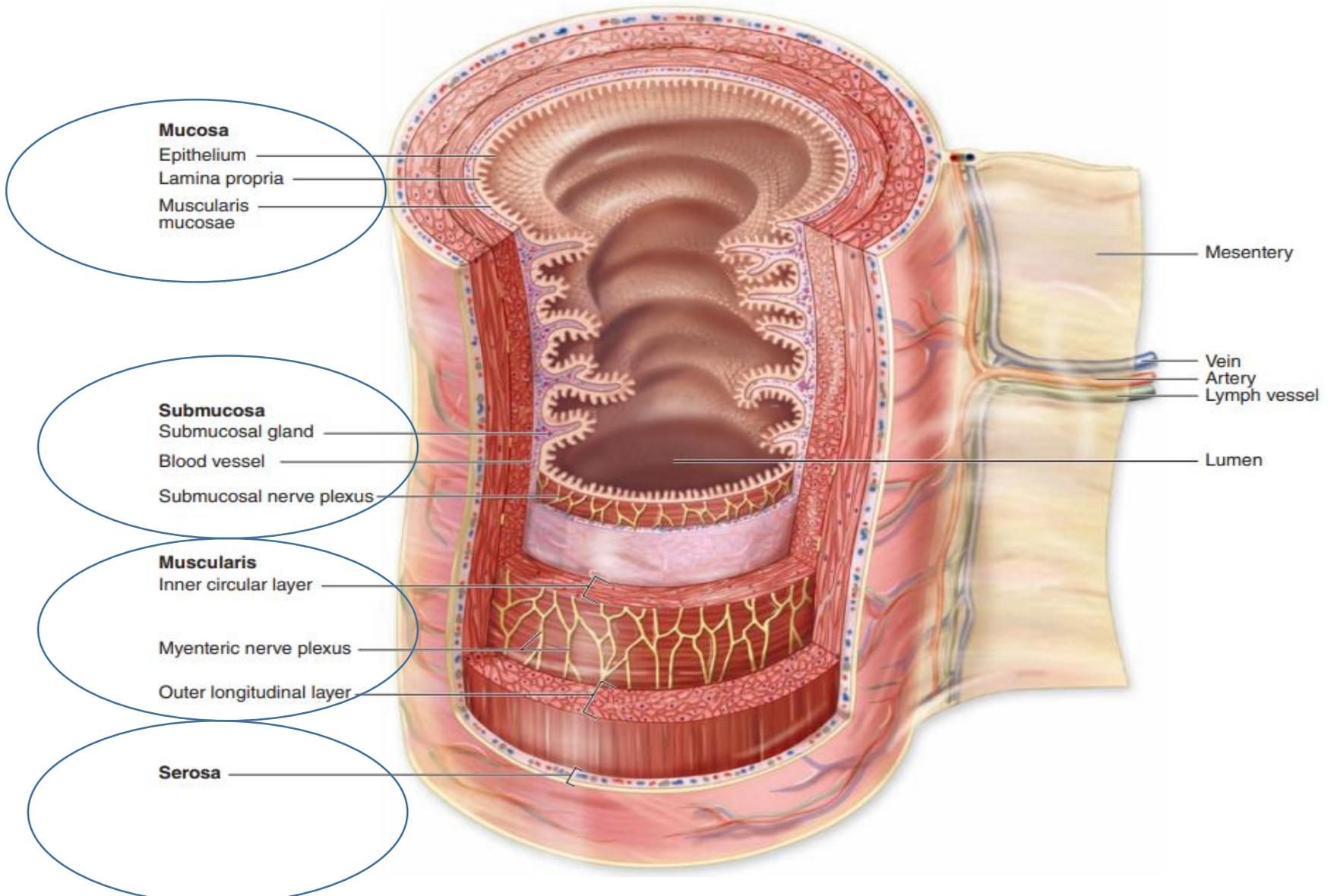
-They are formed of a central core of C.T. and a covering layer of stratified squamous epithelium.

-Types: according to their shape, there are 4 types of papillae:-

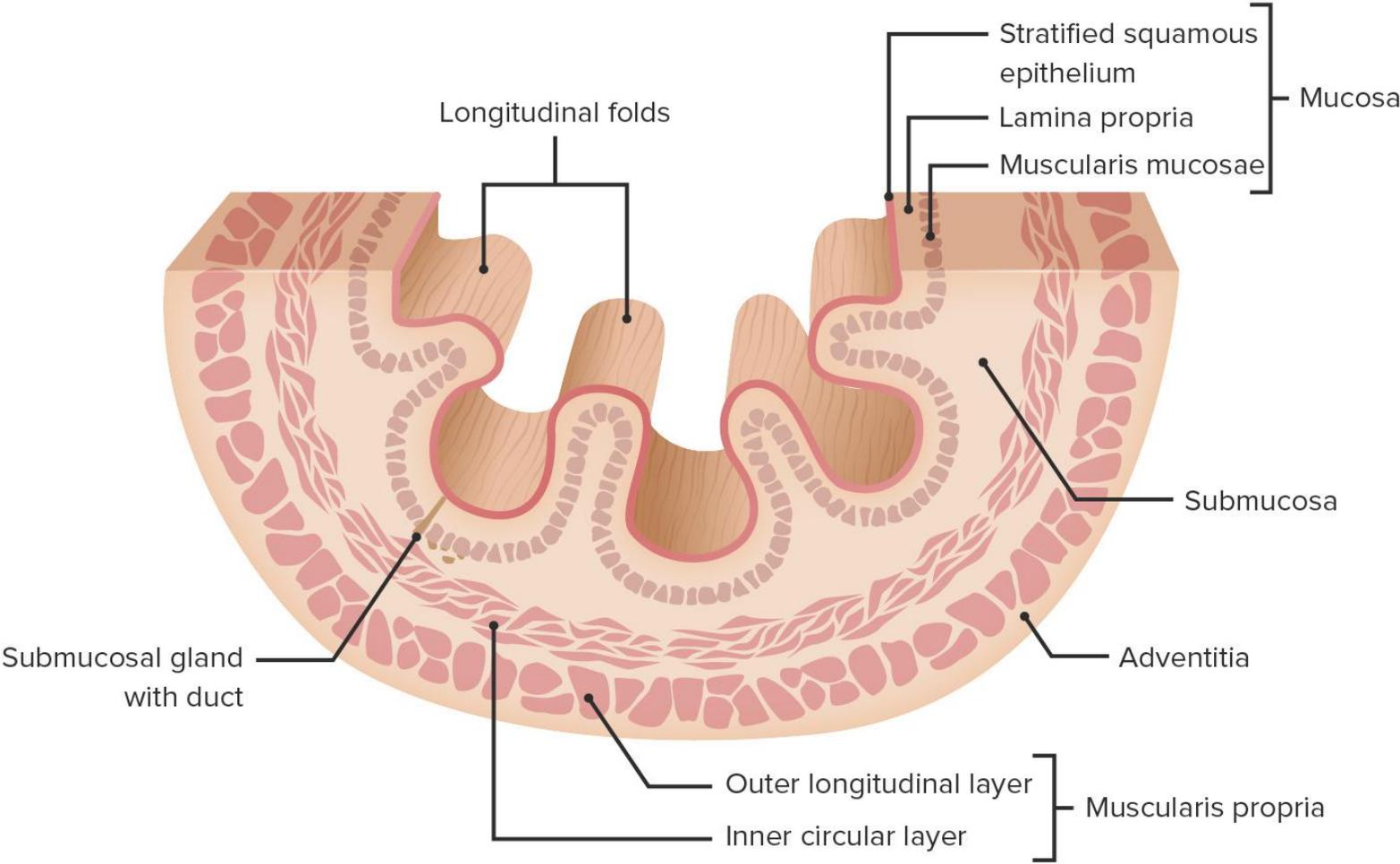
- Filiform papilla
- Fungiform papilla
- Circumvallate papilla
- Foliate papilla (rudimentary in human)



Major layers and organization of the digestive tract



Esophagus



Esophagus

Approximately 10 inches long muscular tube

- The wall is formed of:

1.Mucosa:

- Epithelium: Stratified squamous non - keratinized epithelium
- Lamina propria: C.T
- Muscularis mucosa: inner circular (IC)& outer longitudinal (OL).

2.Submucosa: contains Meissner's plexus and oesophageal glands

3.Musculosa: IC & OL.

Upper one-third: skeletal fibers

Middle one-third: mixed fibers

Lower one-third: smooth fibers

4.Adventitia: loose connective tissue

Parts of the stomach:

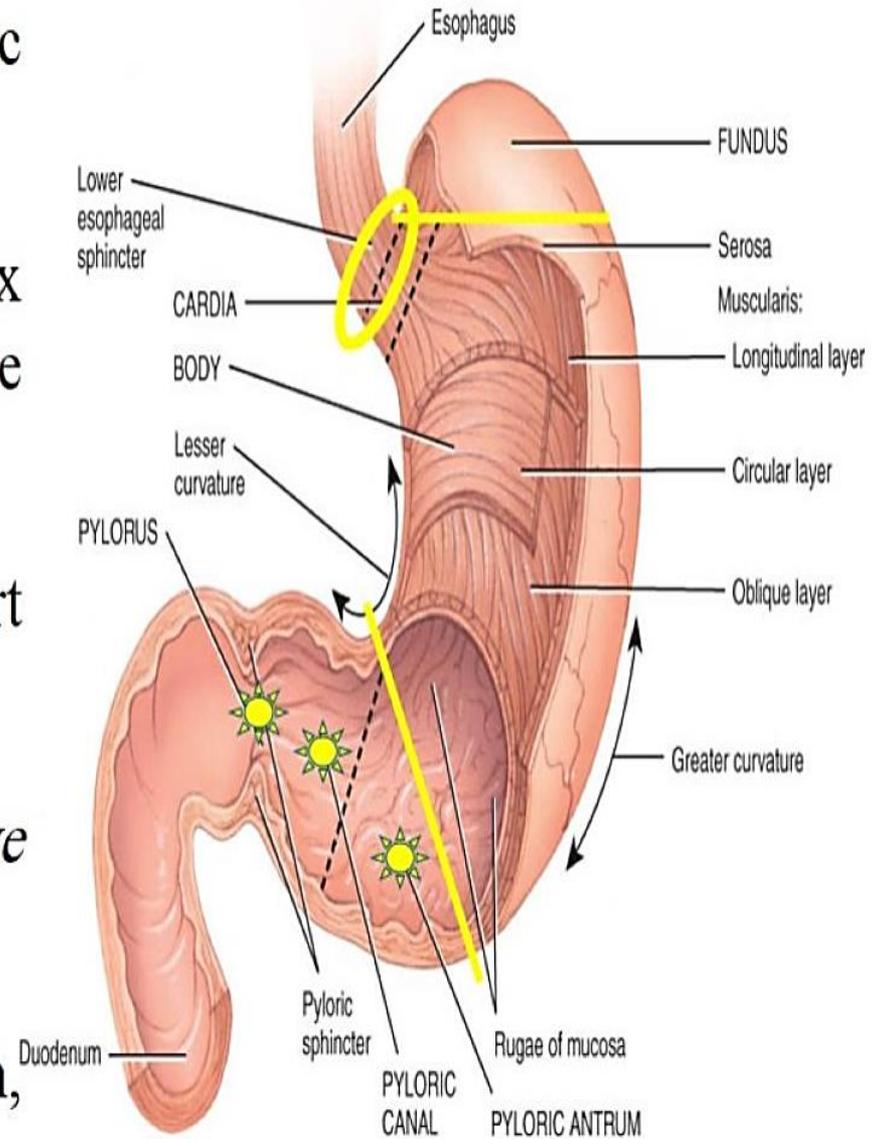
1. Cardiac region: surrounds the cardiac orifice at the gastro-oesophageal junction.

2. Fundic region: It is the upper convex part above the level of the lower end of the oesophagus.

3. Body of the stomach: It is the main part forming the middle 2/3 of the stomach.

NB: *Fundus and body of the stomach have the same structure.*

4. Pyloric region: It is formed of antrum, pyloric canal and pyloric sphincter.



(a) Anterior view of regions of stomach

Structure of the stomach

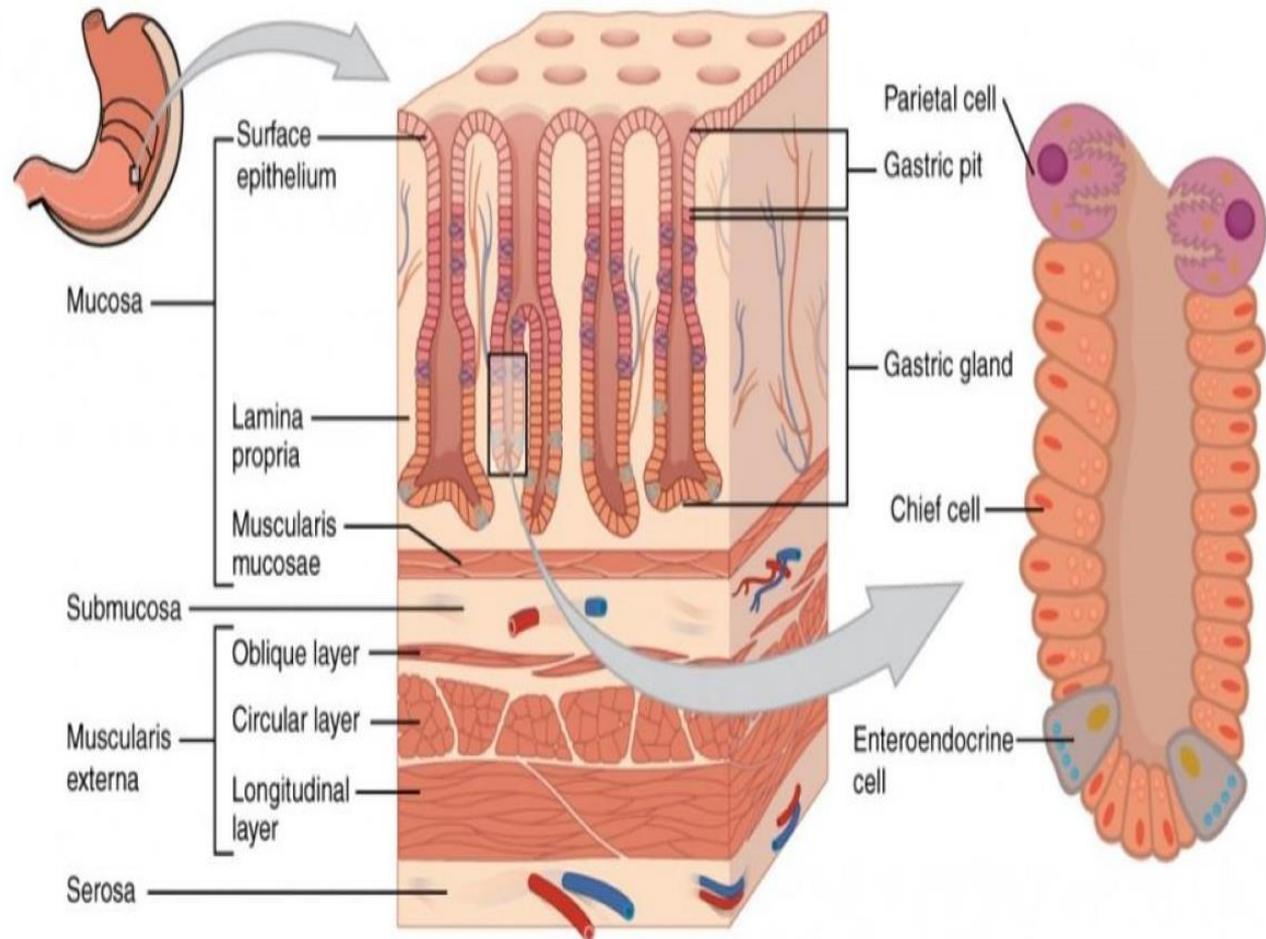
It is formed of 4 layers:

A. Mucosa

B. Submucosa

C. Muscularis

D. Serosa

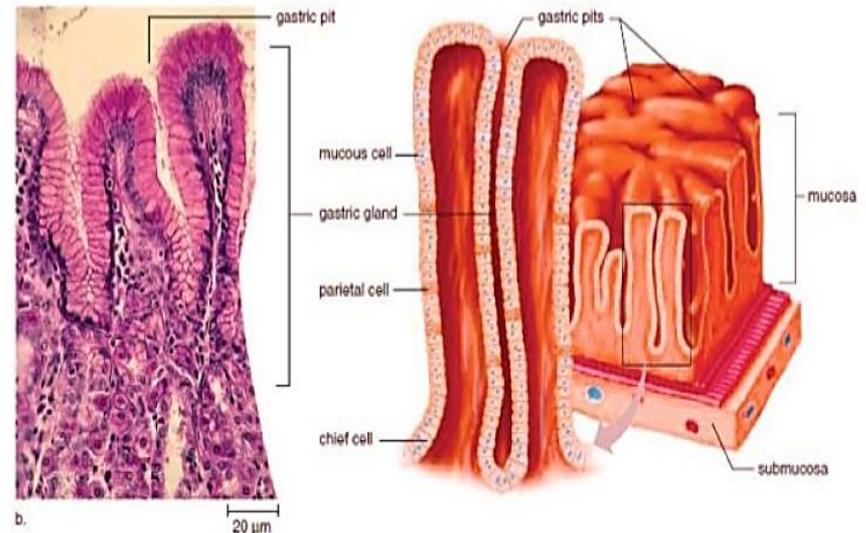
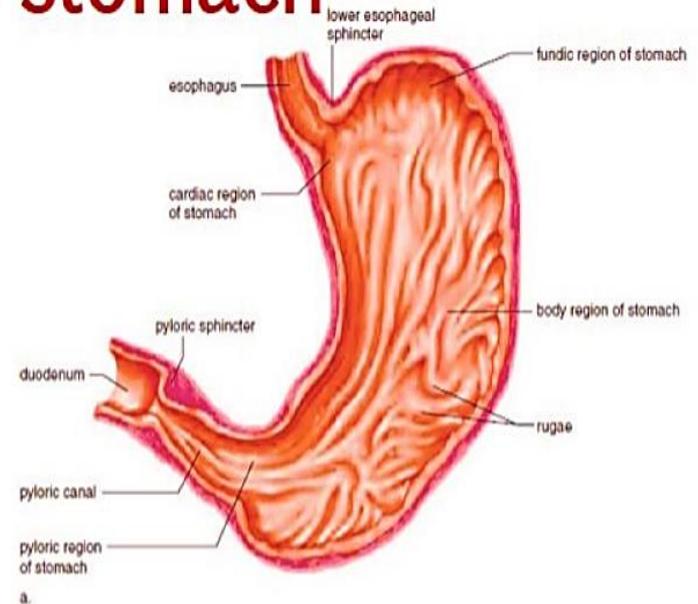


Structure of the stomach

(A) Mucosa:

By naked eye (N/E):

- (1) Smooth surface (has no villi).
- (2) Showing folds called gastric rugae (run in different directions).
- (3) The surface is interrupted by holes (gastric pits) that represents the openings of the gastric glands.



Gastric glands

They are glands in the stomach responsible for producing components of gastric juice, protective mucous and gastric hormones.

Gastric glands include:

Cardiac glands

- Located in cardiac region
- Secrete mucous

Fundic glands

- Located in fundus and body regions
- Secrete digestive enzymes & HCL

Pyloric glands

- Located in pyloric region
- Secrete gastrin and mucus

Lining cells of fundic glands

• Simple columnar secretory cells

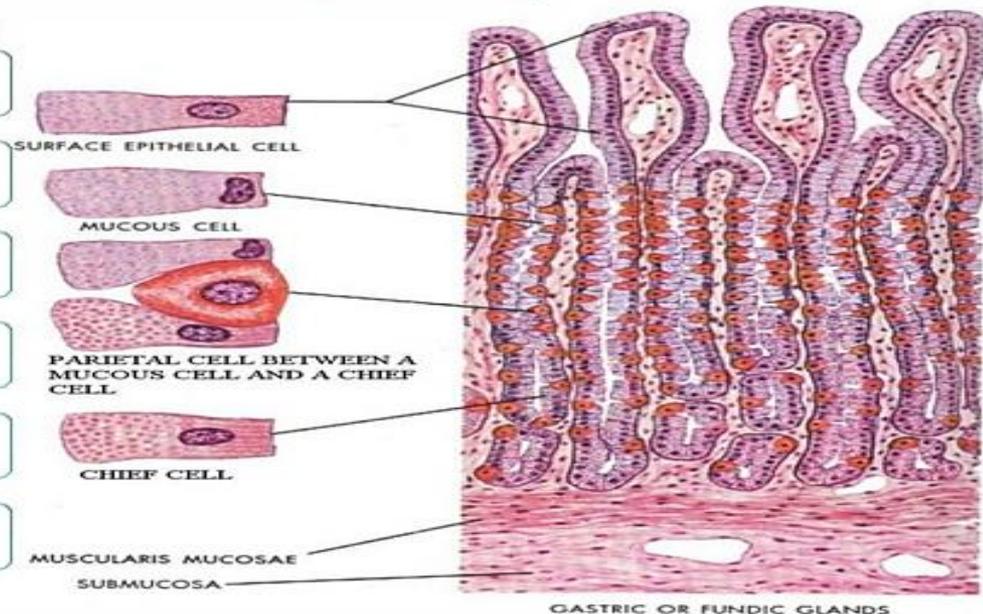
• Mucous neck cells

• Peptic cells

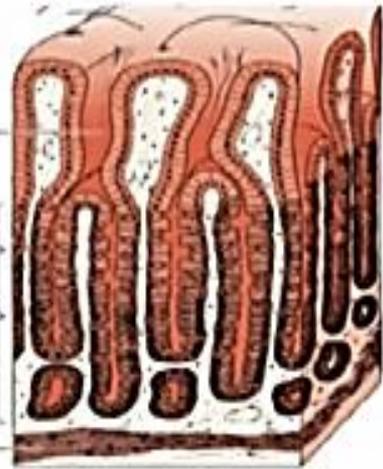
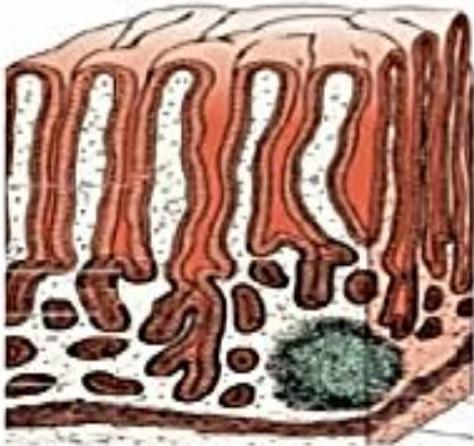
• Parietal cell

• Entero-endocrine cells

• Stem cells



The differences between the fundus and pylorus

	Fundus	Pylorus
<p>* Mucosa:</p> <p>* Duct:</p> <p>* Gland:</p> <ul style="list-style-type: none"> - Type: - Number: - Length: - Arrangement: 	<p>* Thick and more folded.</p> <p>* Short, narrow, occupy 1/4 corium.</p> <ul style="list-style-type: none"> - Simple branched tubular. - More numerous. - Long (occupy 3/4 corium). - Parallel to each other. - Perpendicular to the surface. - Straight - Cut in one plane. 	<p>* Thinner and less folded.</p> <p>* Long-wide occupy 1/2 corium.</p> <ul style="list-style-type: none"> - Coiled, more branched. - Less numerous. - Shorter (occupy 1/2 corium). - Not parallel. - Not perpendicular. - Coiled - Cut in various planes.
		

❑ Mucous Gastric Barrier:

- It is a thick film of mucous which protects the stomach against its enzymes and HCl.
- This mucous is secreted by the surface epithelium and the mucous neck cells.

❑ Function of the stomach:

- (1) Digestion through pepsin and renin enzymes.
- (2) HCl secretion : antibacterial - help fat digestion.
- (3) Secretion of intrinsic factor.
- (4) Secretion of mucous to form gastric barrier.
- (5) Secretion of gastric hormones.
- (6) Limited absorptive function for water, drugs, alcohol and salts.

THE SMALL INTESTINE

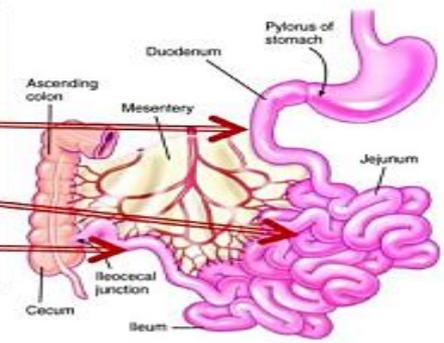
➤ It is a hollow tubular structure (20 feet or 6 m long)

Structure

- Mucosa
- Submucosa
- Muscularis
- Serosa



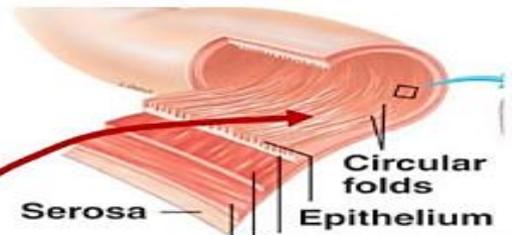
- **Regions**
 - Duodenum
 - Jejunum
 - Ileum



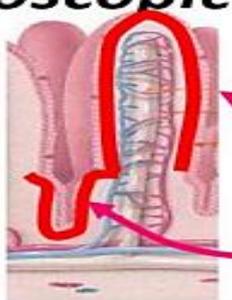
(I) MUCOSA

Gross appearance:

- ❑ Circular permanent folds "*plica circularis*".
- ❑ Velvet appearance → *int.villi*
- ❑ Minute holes → openings of *intestinal crypts*.



Microscopic appearance:

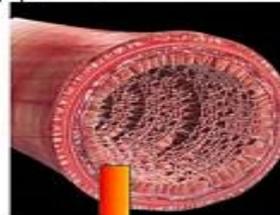


Epithelium:

simple columnar type

Covers Intestinal villi

Lines intestinal crypts.

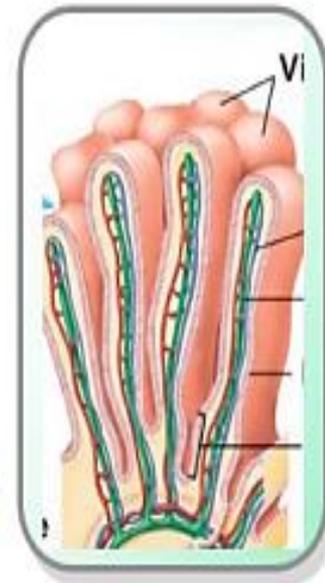


Intestinal villi

Definition:

- finger like projections of **mucosa**
- extending from **wall** into **lumen** of intestine.

Length: 0.5-1.5 mm.



Structure

i. Villous epithelium

Simple columnar absorptive

• 90%

Goblet cells

• 9.5%

Entero-endocrine cells

• 0.5%

ii. Villous core

- CT → bl.v, nerves
- large lymph vessels (*central lacteals*)



(B) INTESTINAL CRYPTS OF LEIBERKUHN (Intestinal glands = crypts of Leiberkuhn)

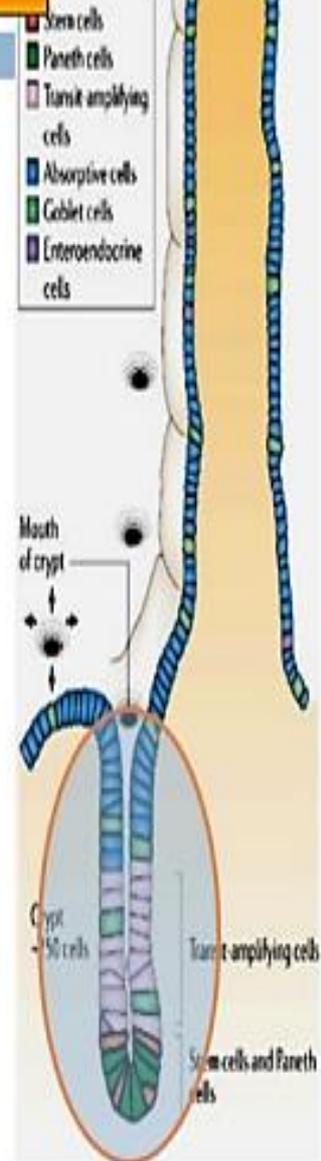
Definition

Simple tubular glands extending from base of intestinal villi to muscularis mucosa.

Length: about 100-200 μm

Lining epithelium

1. Columnar absorbing cells.
2. Goblet cells.
3. Entero-endocrine cells.
4. Stem cells.
5. Caveolate cells.
6. Paneth cells.
7. M-cells.



II- Submucosa

It is formed of loose C.T → bl.vessels, nerves, lymphatics.

In proximal part of duodenum: it contains mucous secreting compound tubulo-alveolar gland called : **“Brunner’s glands”**

In the ileum: it contains **Peyer’s patches:** which pierces muscularis mucosa to appear in submucosa.



It is formed of:

- Inner circular layer of S.M.F. - outer longitudinal layer of S.M.F.

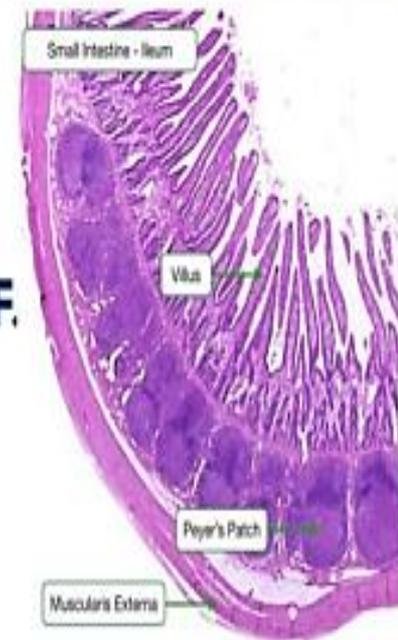
III- Muscularis

It is formed of :

➤ simple sq. mesothelial cells.

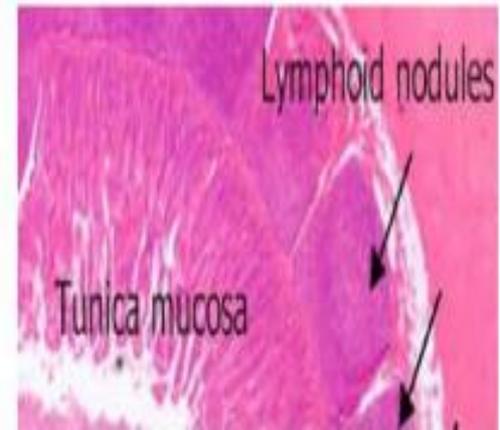
➤ Submesothelial layer of loose C.T → blood vessels, nerves , lymphatics.

IV- Serosa



Differences between the Duodenum, Jejunum and Ileum

Difference	Duodenum	Jejunum	Ileum
1- Shape of villi:	Broad, leaf like	Tongue-shaped	Slender short over Peyer's patches.
2- Goblet cells:	Few +	Numerous ++	More numerous +++
3- M-cells:	Few +	Few +	+++ More numerous over Peyer's patches
5- Brunner's glands:	Present	---	----
6- Peyer's patches:	---	---	Present



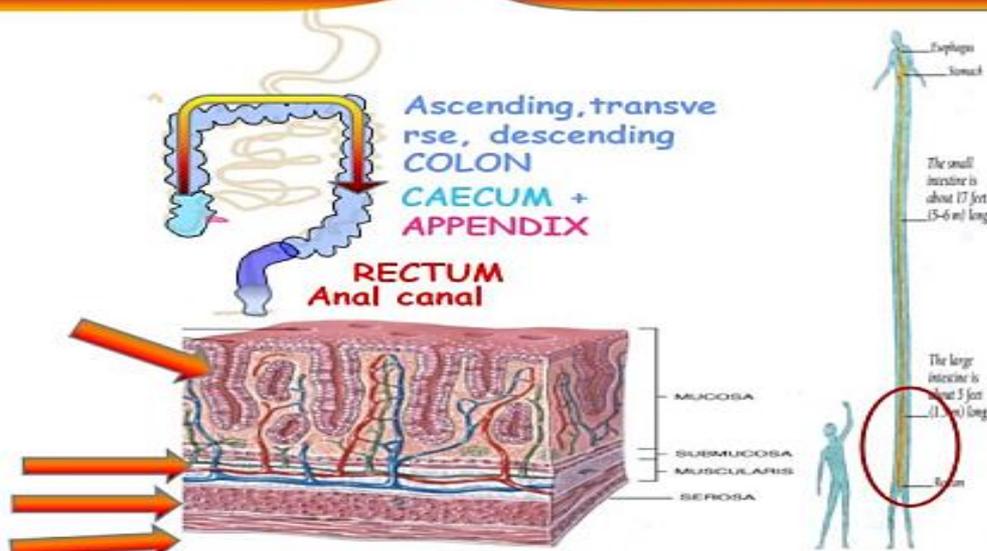
THE LARGE INTESTINE

The wide lower part of digestive canal.

Length: ~1.5 meters (5 feet)

Wall is formed of :

- 1) Mucosa.
- 2) Submucosa.
- 3) Muscularis.
- 4) Serosa.



Mucosa

i. Epithelium:

6 types of cells (no Paneth cells)

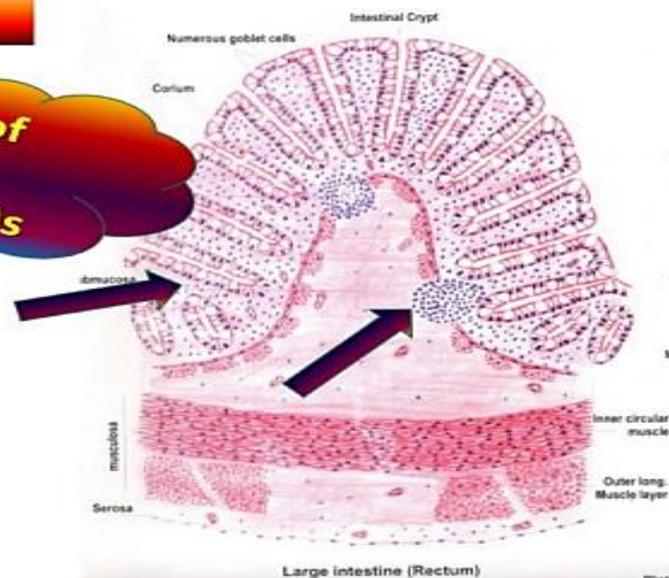
ii C.T. corium:

- Occupied by crypts
- solitary lymph nodules

↓
submucosa

iii Muscularis mucosa:

- well developed
- Inner circular & Outer long.



Submucosa

- Contains lymphocytic infiltration & lymphoid follicles

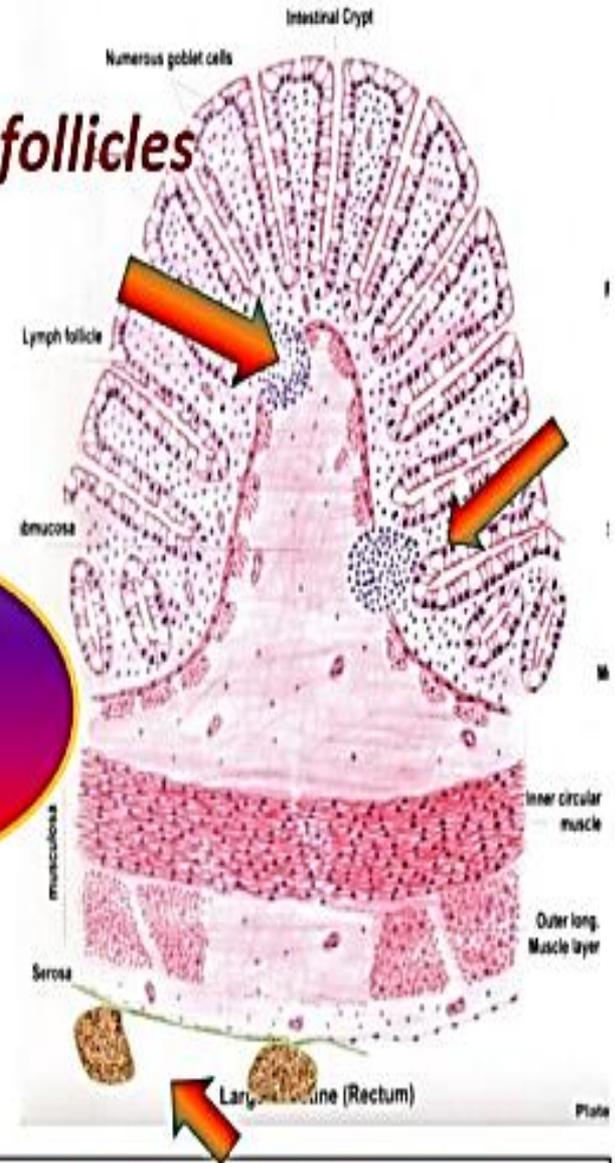
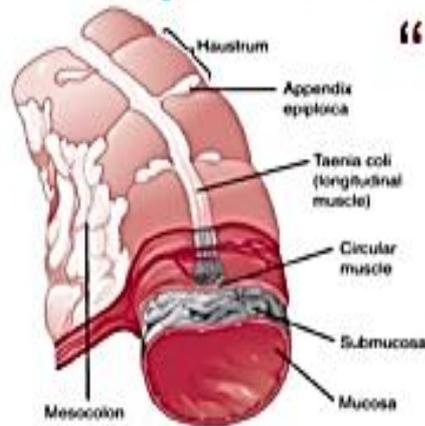
Musculosa

- Inner circular layer of smooth muscle fibers
- Outer longitudinal layer:
breaks up into 3 bands called

“*Taenia coli*”

No *Taenia coli*:
❖ Rectum
❖ Appendix

Serosa



Adipose C.T → hanging into peritoneal Cavity to form: “*appendices epiploicae*”