

HISTOLOGY OF THE GIT

Outline

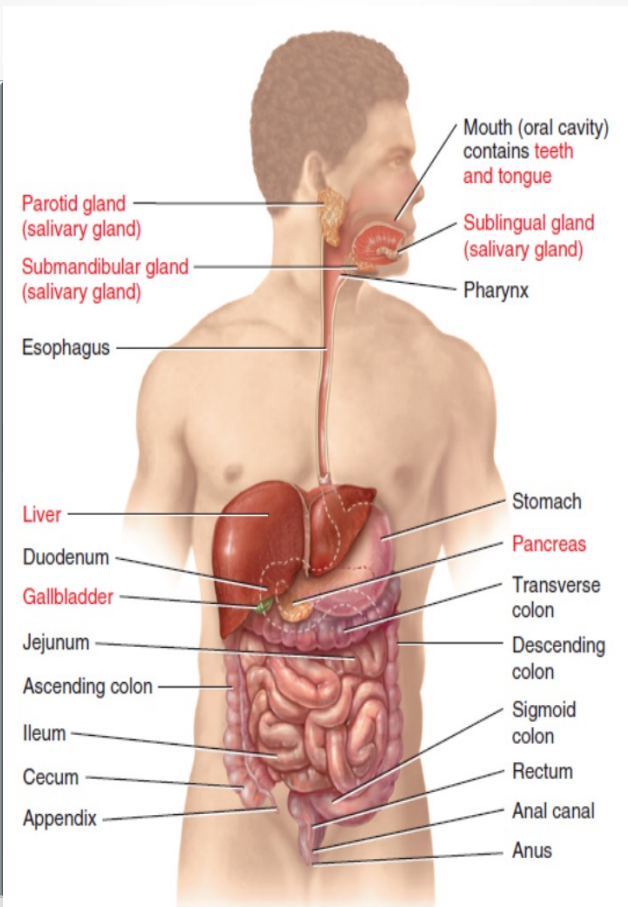
- General features of the GIT histology
- Histology of the of the oral cavity including salivary glands.
- Histology of the esophagus and stomach
- Histology of the small and large intestine
- Histology of the associated glands; liver, gallbladder, and pancreas.

The background of the slide is a light gray gradient with several realistic water droplets of various sizes scattered across it. The droplets have highlights and shadows, giving them a three-dimensional appearance. The text is centered in the middle of the slide.

Gastrointestinal Tract (GIT)

The Gastrointestinal Tract (GIT)

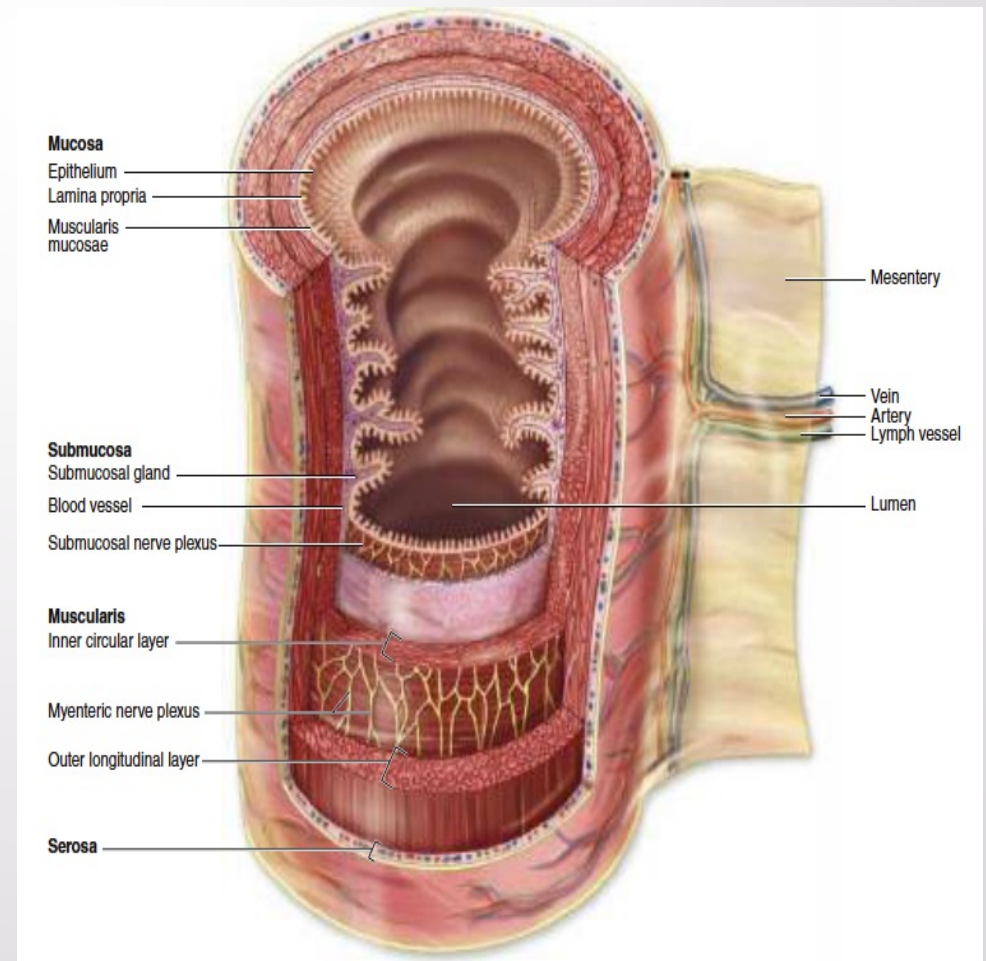
- Consists of a group of organs that break down the food.
- Two groups of organs: the gastrointestinal (GI) tract and the accessory digestive organs.
- Is a continuous tube that extends from the mouth to the anus.
- Include the mouth, most of the pharynx, esophagus, stomach, small intestine, and large intestine.



- The length of the git is about 5–7 meters
- The **accessory digestive organs** include the teeth, tongue, salivary glands, liver, gallbladder, and pancreas.
- Teeth aid in the physical breakdown of food, and the tongue assists in chewing and swallowing.

Layers of The GIT

1. Mucosa
2. Submucosa
3. Muscularis
4. Serosa / adventitia



Layers of The GIT

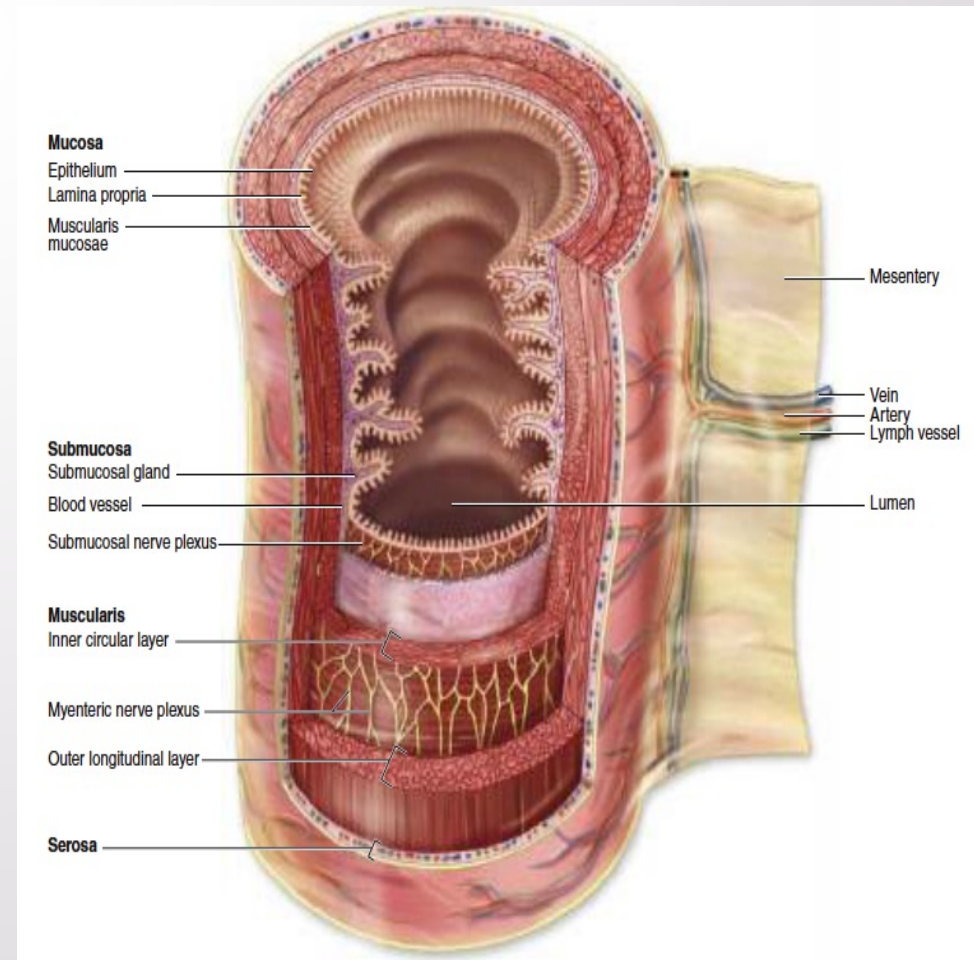
1. Mucosa

- **Composed of:**

(1) a layer of epithelium in direct contact with the contents of the GI tract

(2) a layer of connective tissue called the lamina propria

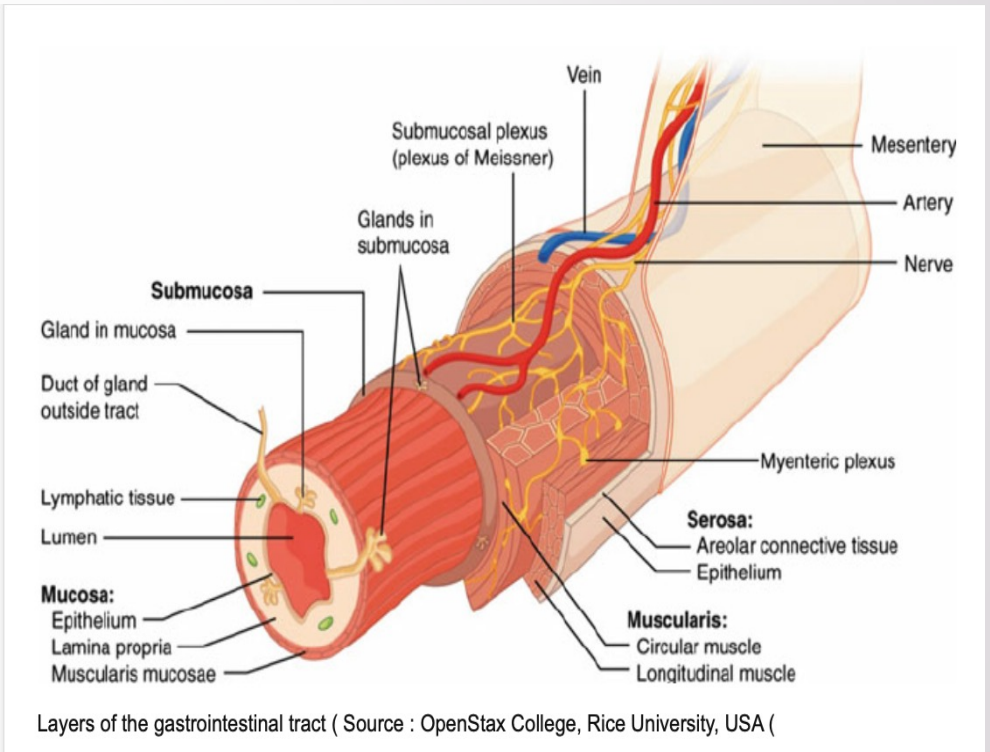
(3) a thin layer of smooth muscle (muscularis mucosae).



Layers Of The GI Tract

➤ Epithelium :

- In the mouth, pharynx, esophagus, and anal canal is mainly nonkeratinized stratified squamous epithelium (protection) some regions in the oral cavity are keratinized.
- Simple columnar epithelium lines the stomach and intestines (secretion and absorption).

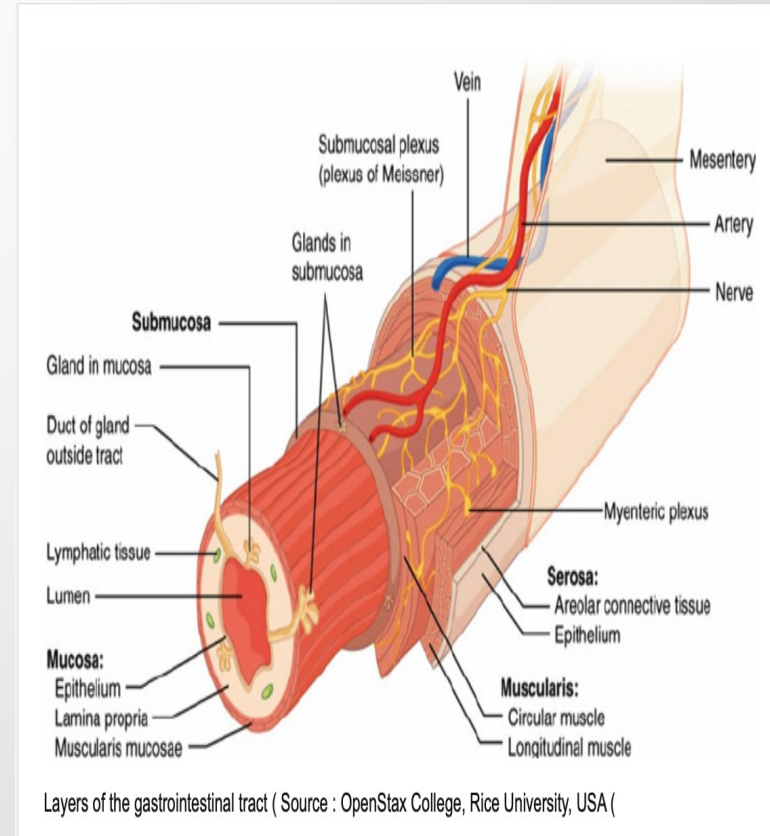


- The rate of renewal every 5 to 7 days.
- Located among the epithelial cells are exocrine cells that secrete mucus and fluid into the lumen of the tract, and several types of endocrine cells, collectively called **enteroendocrine cells** (hormones).

Layers of The GIT

2. Submucosa

- Consists of denser CT that binds the mucosa to the muscularis.
- Contains many blood/lymphatic vessels, and that receive absorbed food molecules.
- Contains an extensive network of neurons (submucosal (**Meissner**) plexus of autonomic nerves and glands.
- Significant lymphoid tissue (MALT)

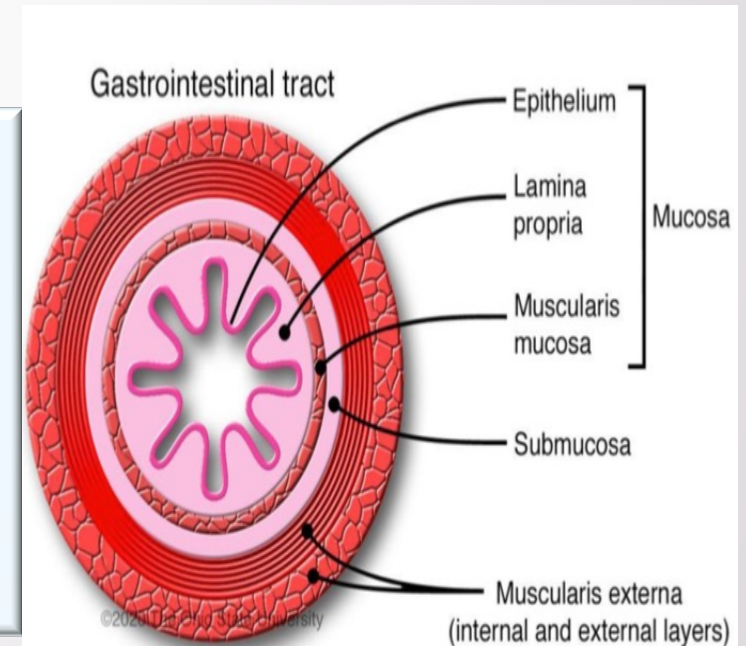


Layers of The GIT

3. Muscularis

- The mouth, pharynx, and superior/middle parts of the esophagus, and external anal sphincter contains *skeletal muscle*.
- Throughout the rest of the tract, it is *smooth muscle*: inner circular fibers and an outer longitudinal fibers.

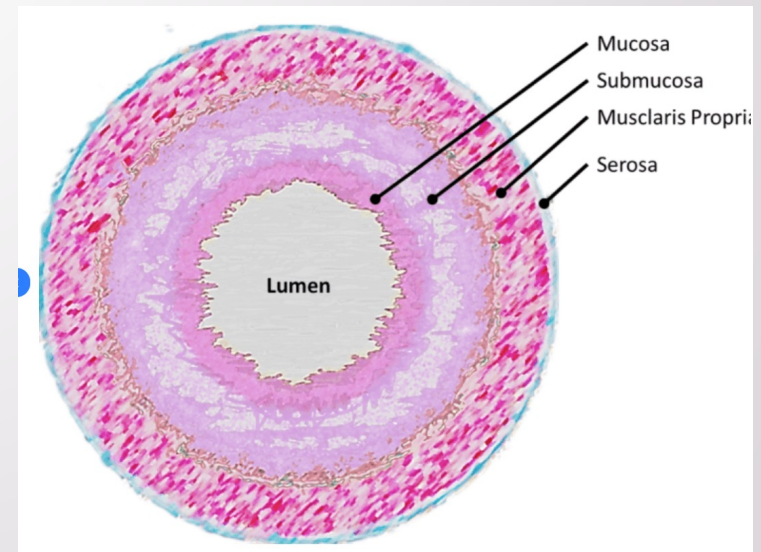
- The connective tissue between the muscle sublayers contains blood and lymph vessels, as well as the myenteric (**Auerbach**) nerve plexus of many autonomic neurons aggregated into small ganglia.
- Contractions of the smooth muscle break down food, mix it with digestive secretions, and propel it along the tract.



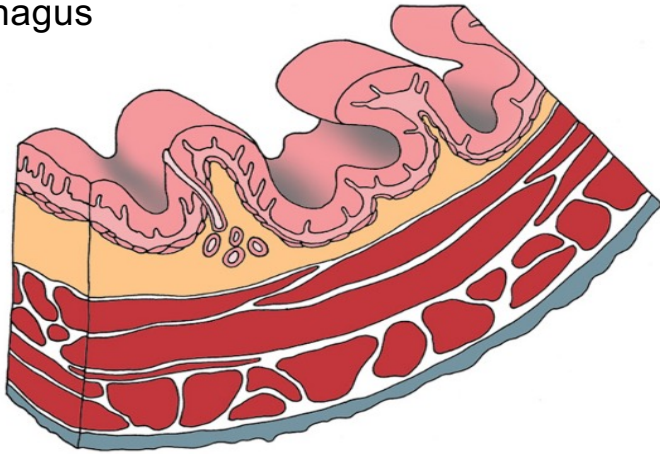
Layers of The GIT

4. Serosa

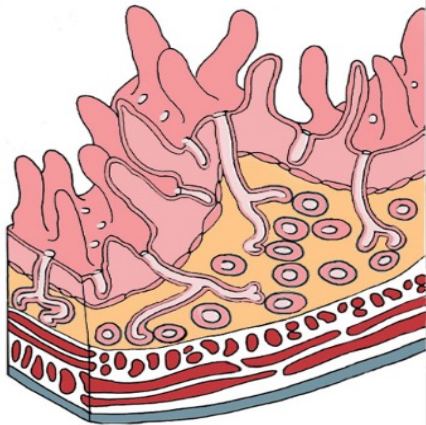
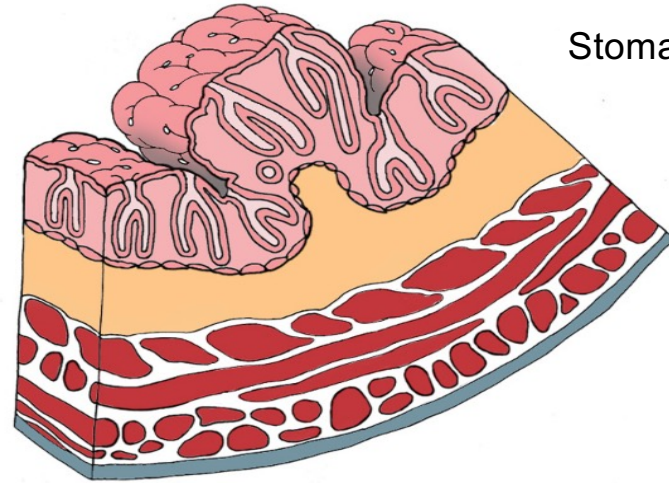
- Those portions of the GI tract that are suspended in the abdominal cavity have a superficial layer called the **serosa**.
- Is a serous membrane composed of areolar connective tissue and simple squamous epithelium (mesothelium).
- The esophagus lacks a serosa; *adventitia* forms the superficial layer of this organ.



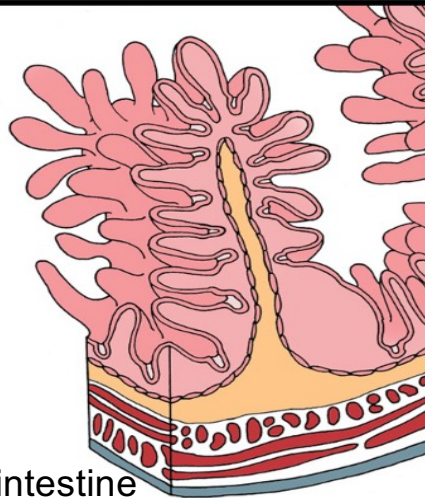
Esophagus



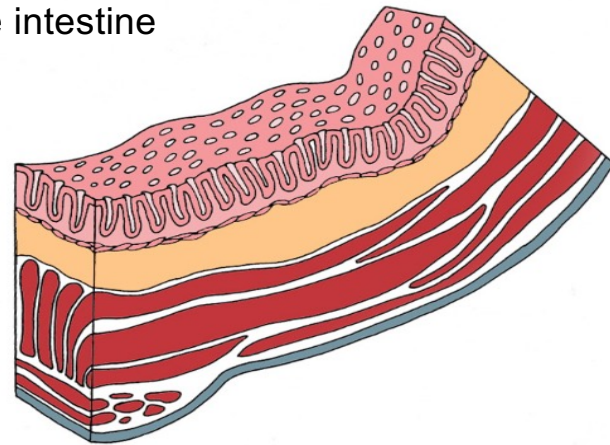
Stomach



Small intestine



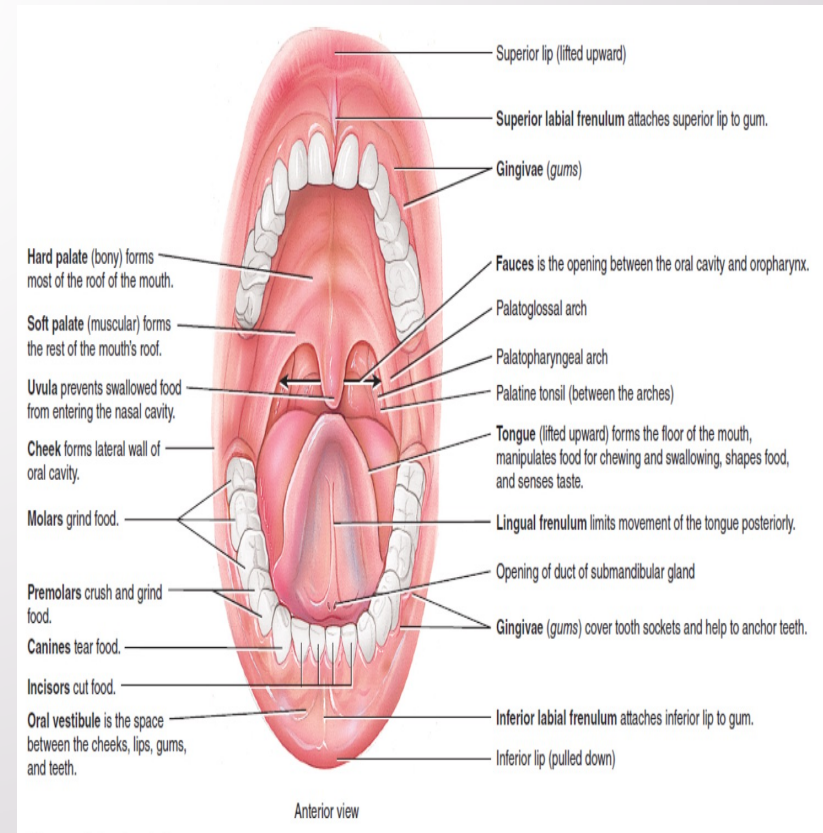
Large intestine



The Mouth

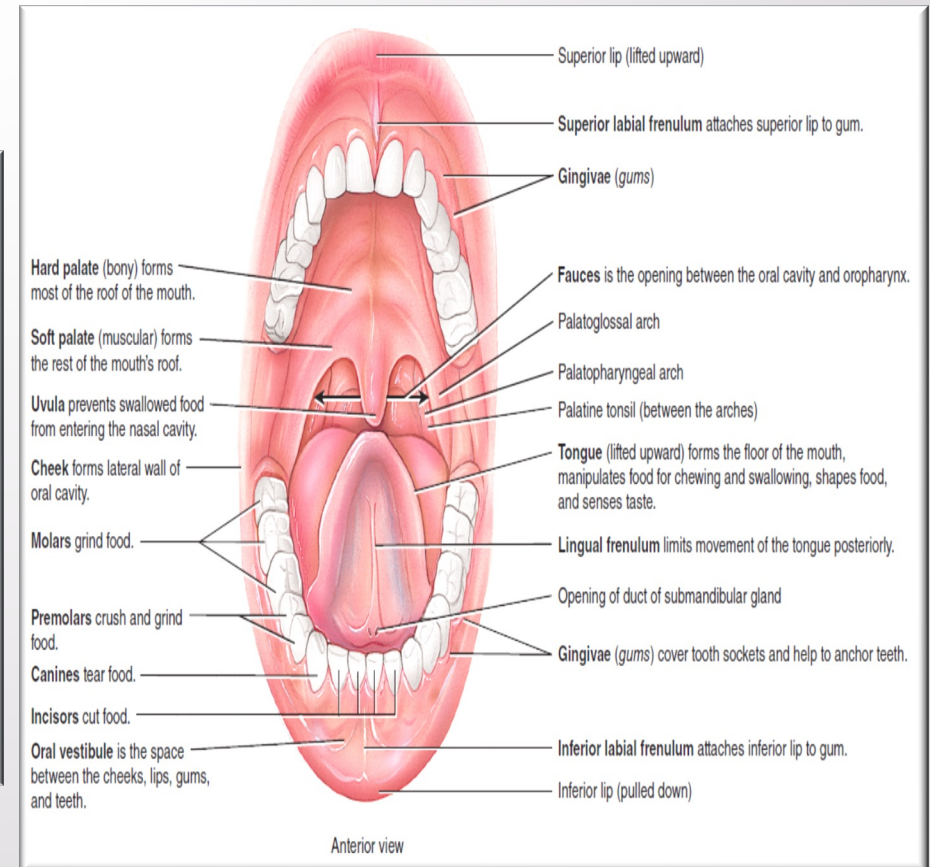
- Also called the **oral** or **buccal cavity**.
- The **cheeks** form the lateral walls of the oral cavity; covered externally by skin and internally by a mucous membrane (nonkeratinized stratified squamous epithelium).
- The anterior portions of the cheeks end at the lips.

READ ONLY



The Mouth

- **Lips:** fleshy folds surrounding the opening of the mouth.
- They contain the orbicularis oris muscle and are covered externally by skin and internally by a mucous membrane.
- The **oral vestibule** is the space bounded externally by the cheeks and lips and internally by the gums and teeth.
- The **oral cavity proper** is the space that extends from the gums and teeth to the **fauces** (the opening between the oral cavity and the oropharynx)



1. Keratinized stratified squamous (SS)--- masticatory mucosa

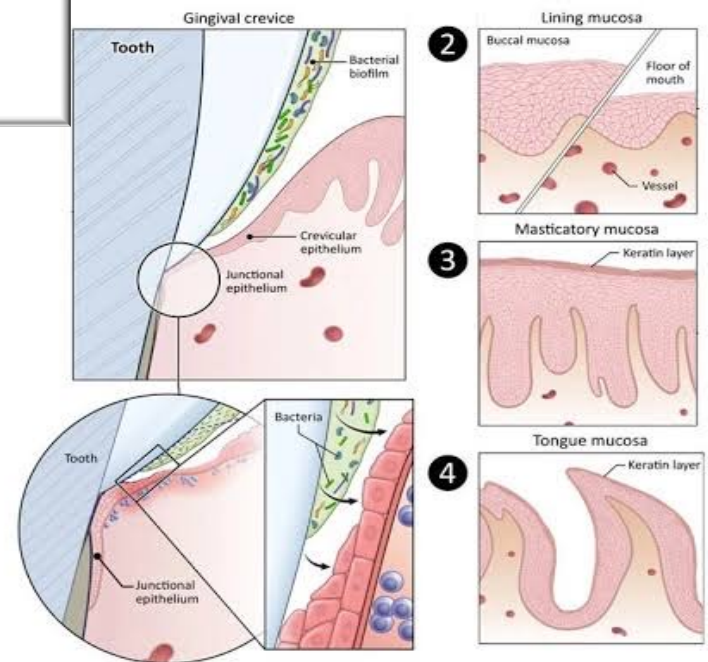
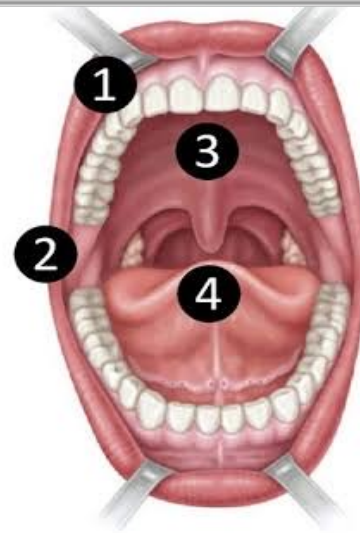
- Gums and hard palate
- Lamina propria rest on periosteum.

2. Partially keratinized ss

3. Nonkeratinized ss—lining mucosa

- Thick submucosa containing minor salivary glands and lymphoid tissue.
- Soft palate, cheeks, floor of the mouth, and pharynx
- Contains antigen presenting cells
- Rich sensory innervation

Oral cavity:



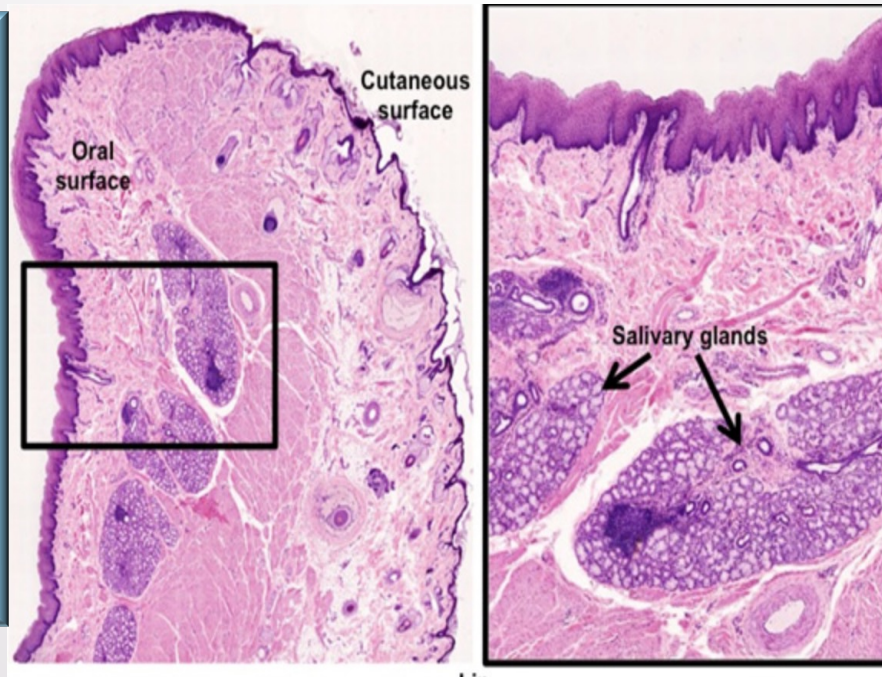
Canker sores

- *Viral infections with herpes simplex 1 cause death of infected epithelial cells that can lead to vesicular or ulcerating lesions of the oral mucosa or skin near the mouth.*
- *Occur when the immune defenses are weakened by emotional stress, fever, illness, or local skin damage, allowing the virus, present in the local nerves, to move into the epithelial cells.*

LIPS

Internal mucous

surface has lining mucosa with a thick, nonkeratinized epithelium and many minor labial salivary glands.



Outer surface

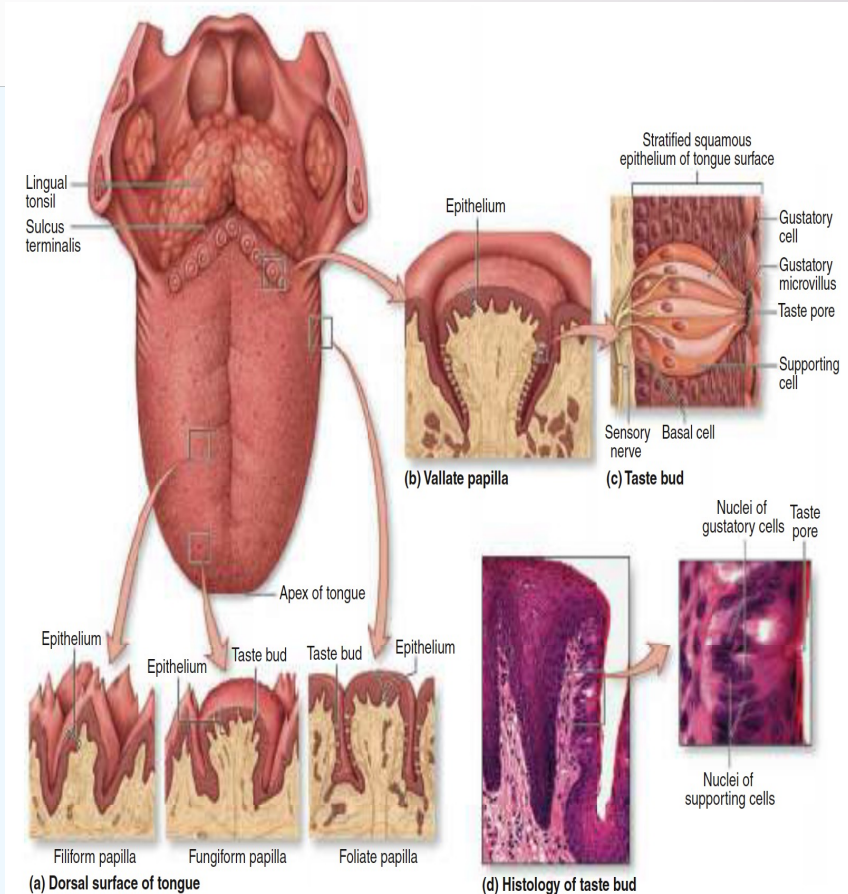
Has thin skin, consisting of epidermal and dermal layers, sweat glands, and many hair follicles with sebaceous glands

Red vermilion zone

- *Covered by very thin keratinized stratified squamous epithelium.*
- *Lacks salivary or sweat glands and is kept moist with saliva.*
- *Connective tissue is very rich in both sensory innervation and capillaries---pink color to this region.*

Tongue

- An accessory digestive organ composed of skeletal muscle covered with mucous membrane.
- Connective tissue between the small fascicles of muscle is penetrated by the lamina propria, which makes the mucous membrane strongly adherent to the muscular core



Tongue

The extrinsic muscles of the tongue:

- Originate outside the tongue and insert into connective tissues in the tongue.
- Move the tongue from side to side and in and out to maneuver food for chewing,
- Force the food to the back of the mouth for swallowing.

The intrinsic muscles of the tongue

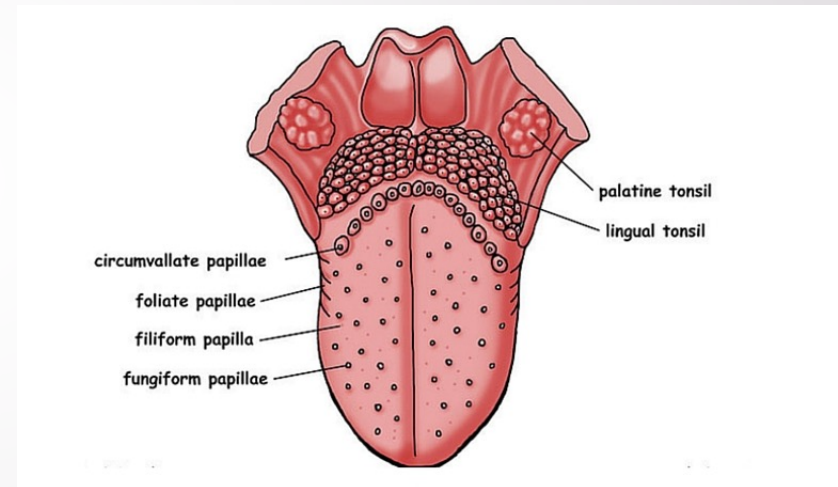
- Originate in and insert into connective tissue within the tongue.
- They alter the shape and size of the tongue for speech and swallowing
- The dorsum (upper surface) and lateral surfaces of the tongue are covered with **papillae** (projections of the lamina propria covered with stratified squamous epithelium).
- Many papillae contain taste buds.
- Some papillae lack taste buds, but they contain receptors for touch.

Tongue

Filiform papillae: very numerous, an elongated conical shape, and are heavily keratinized (gray or whitish) appearance.

Fungiform papillae: much less numerous, lightly keratinized, and interspersed among the filiform papillae. Mushroom-shaped with well-vascularized and innervated cores of lamina propria.

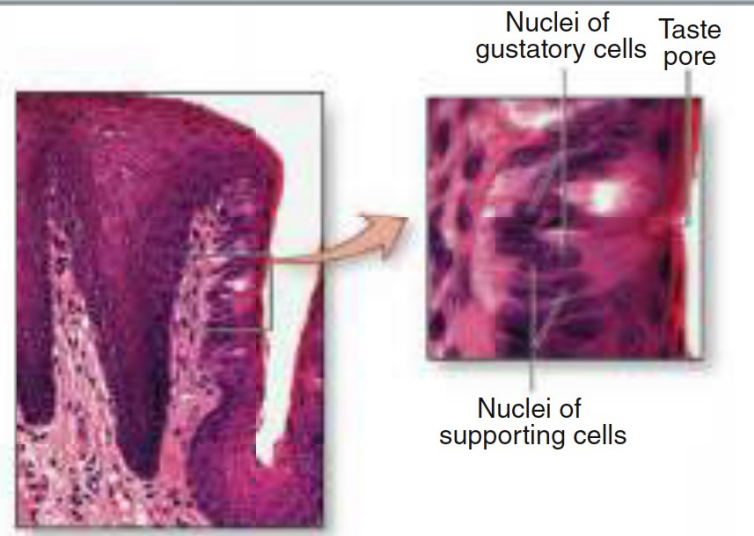
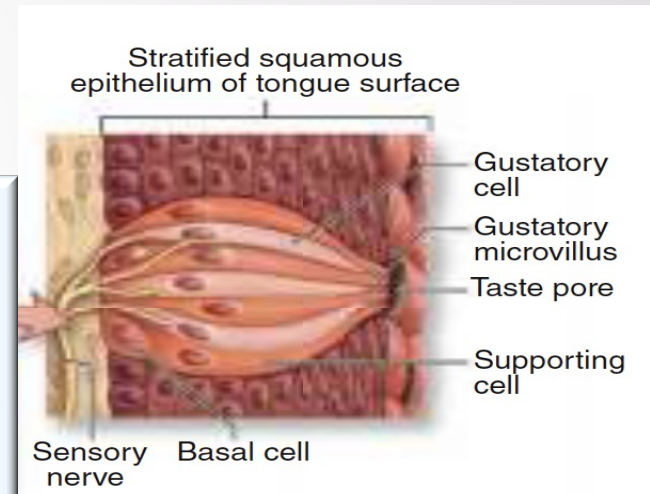
- **Vallate (or circumvallate) papillae:** the largest papillae, 8-12, are aligned in front of the terminal sulcus. Ducts of several small, serous salivary (Von Ebner) glands empty into the deep groove surrounding each vallate papilla



- **Foliate papillae:** several parallel ridges on each side of the tongue, anterior to the sulcus terminalis, but are rudimentary in humans, especially older individuals.

Tongue-Taste Buds

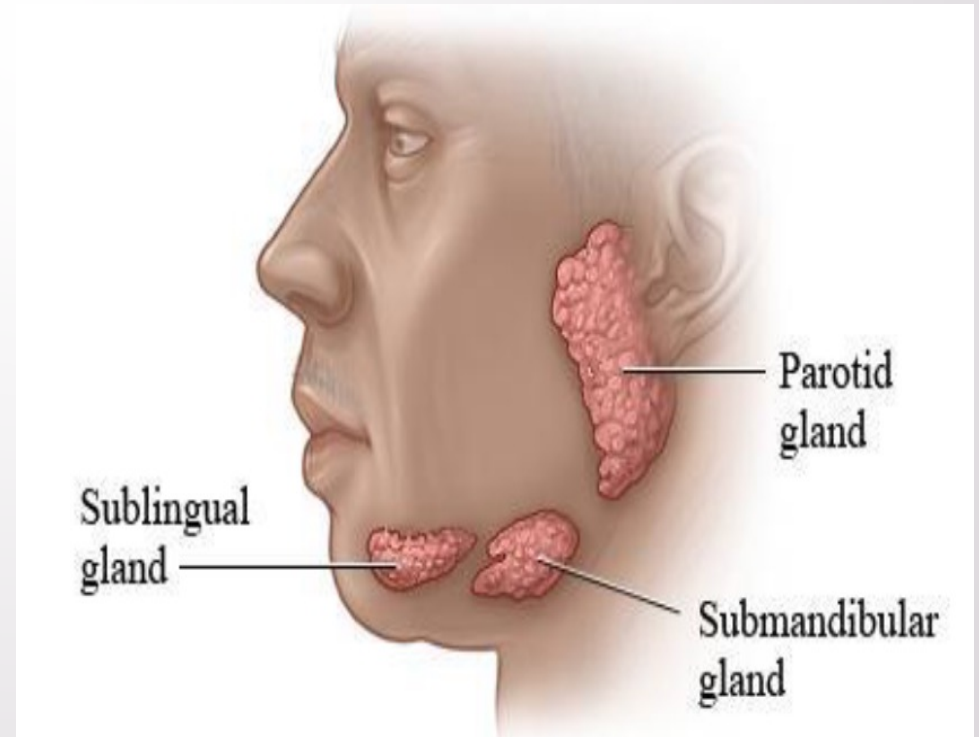
- Ovoid structures within the stratified epithelium on the tongue's surface.
- Around 250 taste buds are present on the lateral surface of each vallate papilla.
- Many present on fungiform and foliate but NOT the filiform.



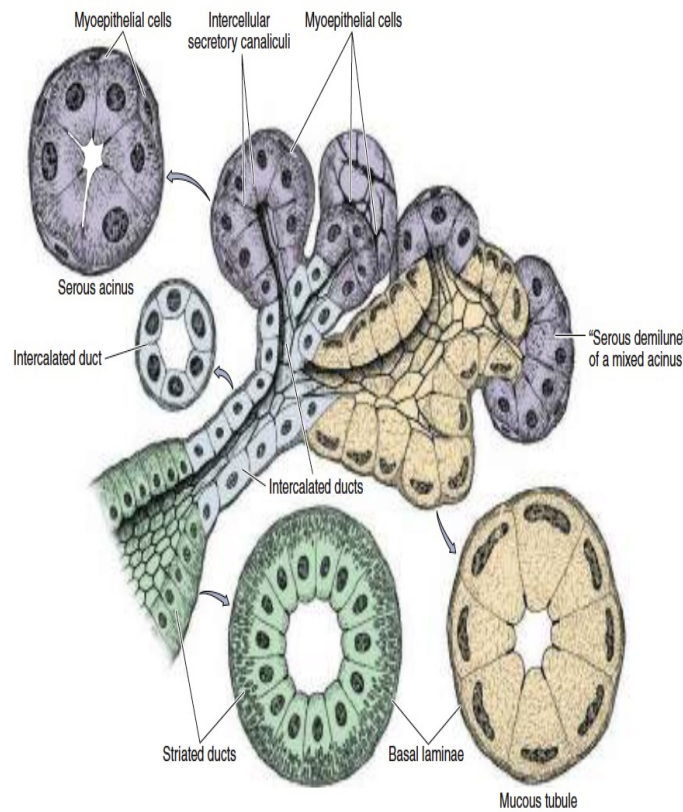
- They are not restricted to papillae and are scattered on the dorsal and lateral surfaces of the tongue.
- A taste bud has 50-100 cells, about half of which are gustatory (taste) cells.
- Is entered by afferent sensory axons---synapses with the gustatory cells.
- Apically, gustatory cells have microvilli project toward a 2-um-wide opening-- taste pore—molecules---dissolve in saliva--

Salivary Glands

- A gland that releases a saliva into the oral cavity.
- The mucous membrane of the mouth and tongue contains many small (**minor**) salivary glands that open to the oral cavity.
- Most saliva is secreted by the **major salivary glands**.

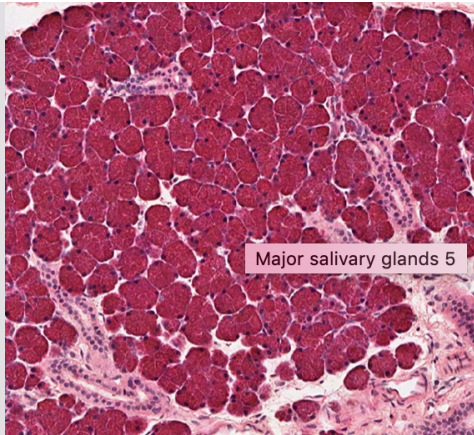


- **Serous cells:** are polarized protein-secreting cells, pyramidal in shape, with round nuclei, well-stained RER, and apical secretory granules. Form a somewhat spherical unit called an acinus -- very small central lumen. Secrete enzymes and other proteins.



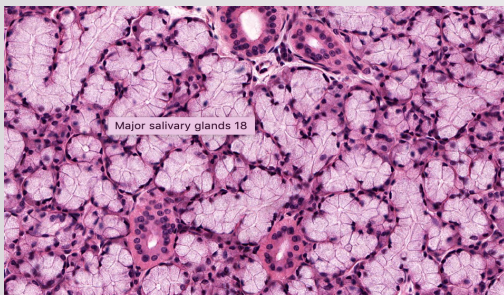
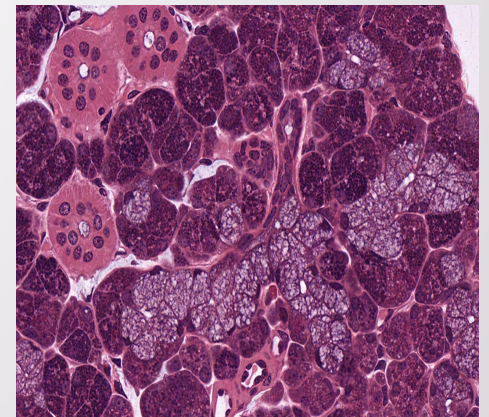
- **Mucous cells:** columnar in shape, compressed basal nuclei. Contain apical granules with hydrophilic mucins. Poor cell staining. Organized as cylindrical tubules rather than acini.

- **Myoepithelial cells:** Small, flattened cells extend several contractile processes around the associated secretory or duct and their activity is important for moving Secretory products into and through the ducts.
- Mixed salivary glands have tubuloacinar secretory units with both serous and mucous secretion.



- **Parotid glands:** branched acinar glands with exclusively serous acini. Serous cells of parotid glands secrete abundant α -amylase that initiates hydrolysis of carbohydrates and proline-rich proteins with antimicrobial and other protective properties.

- **Submandibular glands:** are branched tubuloacinar glands, primarily serous acini with many mixed tubuloacinar secretory units. Secretes α -amylase lysozyme.
- **Serous demilune:** serous cells occur distally on short mucous tubules and often assume a crescent-shaped.



- **Sublingual glands:** smallest, branched tubuloacinar glands, but tubules of mucous cells predominate. Few serous cells add amylase and lysozyme.

The image features a light gray background with several realistic water droplets of various sizes scattered across it. The droplets are rendered with soft shadows and highlights, giving them a three-dimensional appearance. In the center of the image, the letters "LIP" are written in a bold, black, serif font.

LIP

