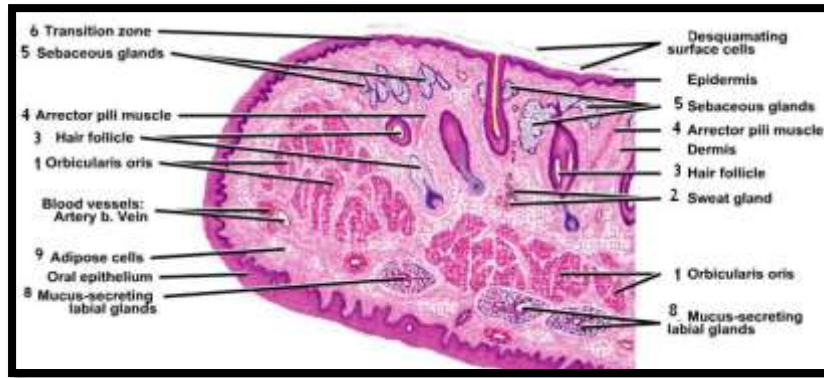


Digestive system

Oral cavity

The oral cavity is formed in part by the lips and cheeks . In the oral cavity , this region lined by non -keratinized stratified squamous epithelial tissue.

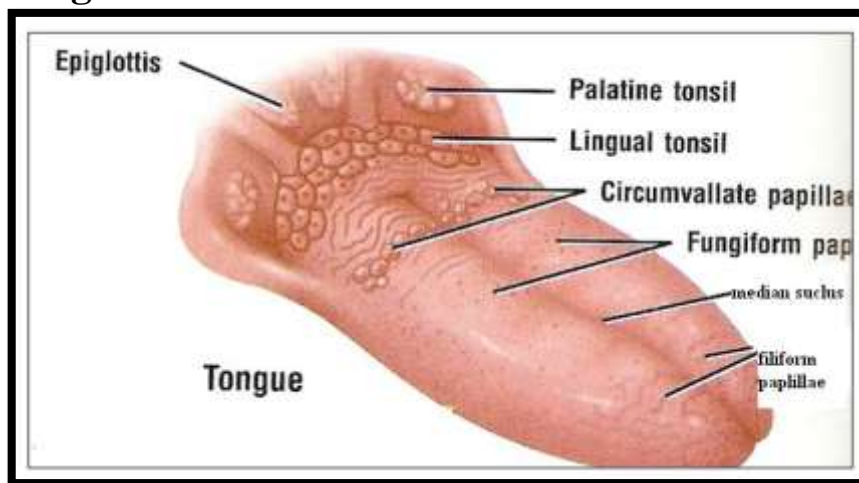


longitudinal section of the lip

Lips The core of the lips contain a large of striated muscles called orbicularis oris (1).In the upper part of the figure showed the thin skin epidermis and dermis {sweat glands 2 , hair follicles 3 with erector pili muscle 4 (which is the smooth muscle attached to hair follicles) and sebaceous glands 5} .

The transition zone (6) from the thin epidermis to the epithelium ,this zone characterized by rich blood vessels that giving the lip red color In the lower part of the figure showed thick oral epithelium (non-keratinized stratified epithelium ,the underling oral epithelium found loose connective tissue with numerous labial glands 8, 9 adipose tissue 10.

Tongue

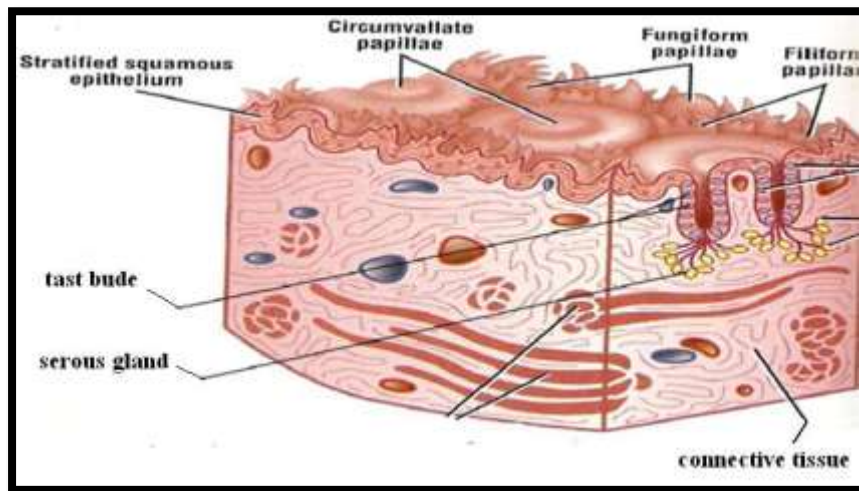


The dorsal surface of the tongue is rough because of its characterized by numerous of mucosal projections called papillae in contrast the

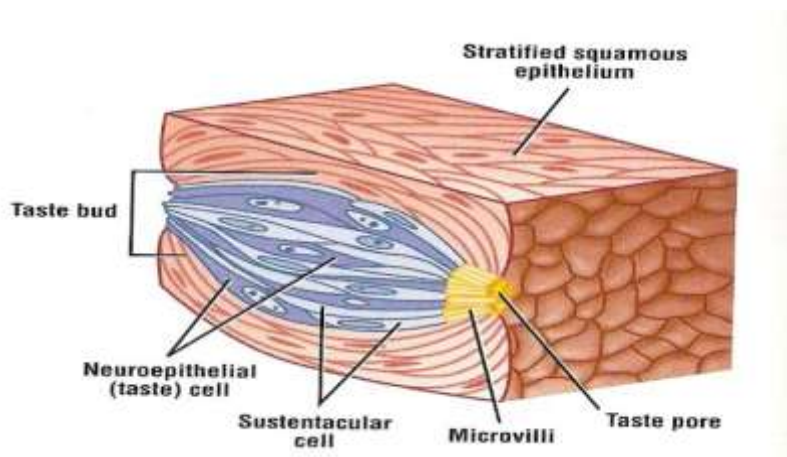
mucosa of the ventral surface is smooth . The core of the tongue concentrate of criss-crossing bundle of skeletal muscles in different directions (longitudinal , circular and oblique).

Types of the tongue papillae:-

- 1- **Filiform papillae:** The most numerous and smallest papillae on the surface of the tongue
- 2- **Fungiform papillae:** Less numerous but larger and broader than the filiform papillae ,Mushroom like shape .
- 3- **Circumvallate papillae:** are much larger than fungiform and filiform papillae and located in the posterior region of the tongue. Within the stratified of the lingual mucosa the taste buds embedded ,however they are distinguished by oval shape and elongated cells .



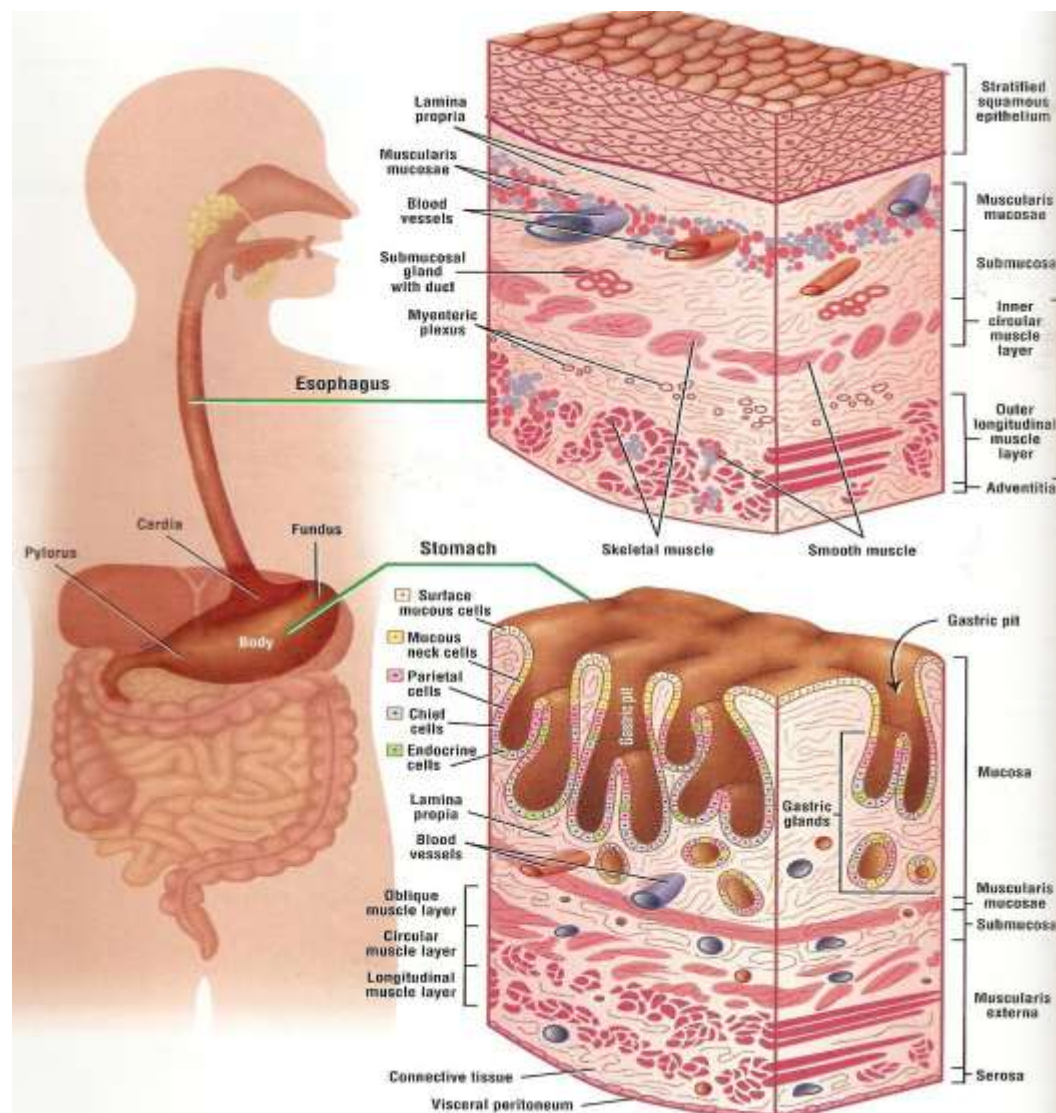
Taste buds :- Are barrel-shape structure ,located in the epithelium of the papillae with pore called taste pore



several types of cells are found in the taste buds :-

- a- Sustentacular cells: are elongated and exhibit a lighter cytoplasm with slender dark nucleus
- b- Taste (gustatory)cells :-dark cytoplasm and more oval lighter nucleus
- c- basal cells :- are located at the peripheral of the taste buds near the basement membrane .

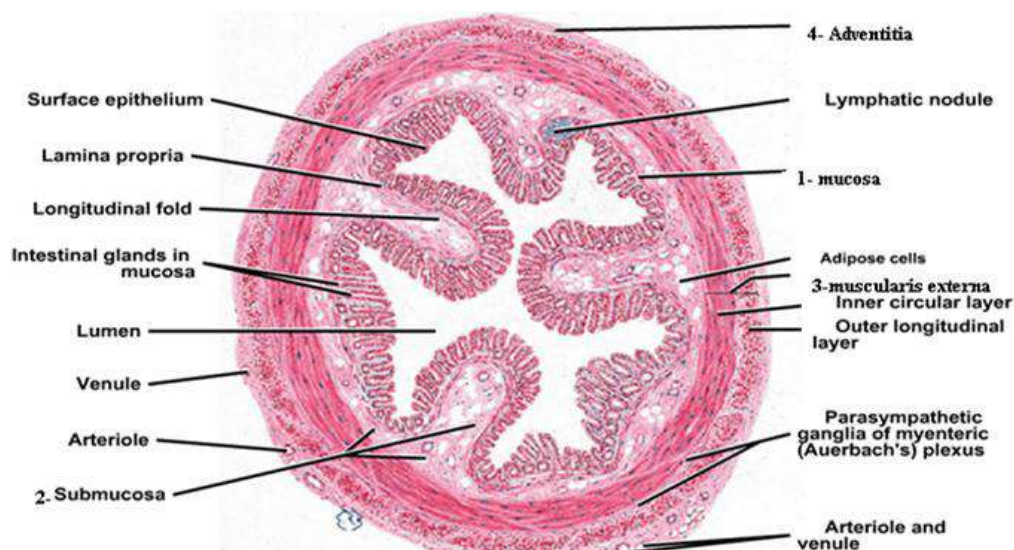
Gastrointestinal tract (Gut)



The gastrointestinal tract is a long ,hollow tube that extends from the esophagus to the rectum . It includes the esophagus ,stomach ,small

intestine (duodenum , jejunum and ileum) ,large intestine (colon) and rectum. The wall of the digestive tube exhibits four layers that show a basic histologic organization . these layers are the mucosa,Submucosa ,Muscularis externa and Serosa or adventitia. Because of the different functions of the digestive organs in the digestive process ,the morphology of these layers exhibits variations.

- 1- Mucosa :- Is the innermost layers of the digestive tube . It consists of the a covering epithelium and glands that extend into the underlying layer of loose connective tissue ,called the lamina propria . An inner circular and outer longitudinal layers of smooth muscles called the Muscularis mucosa ,from the outer boundary of the mucosa .
- 2- Submucosa :- Is located below the mucosa . It consists of dense irregular connective tissue . with numerous blood and lymph vessels and nerve plexus
- 3- Muscularis externa :- Is a thick ,smooth muscle layer that is located inferior to the Submucosa in circular and longitudinal directions.
- 4- Serosa or adventitia :- Is a thin layer of loose connective tissue that surrounded the visceral organs.



The four layers of the gastrointestinal tract (Gut)

Esophagus:

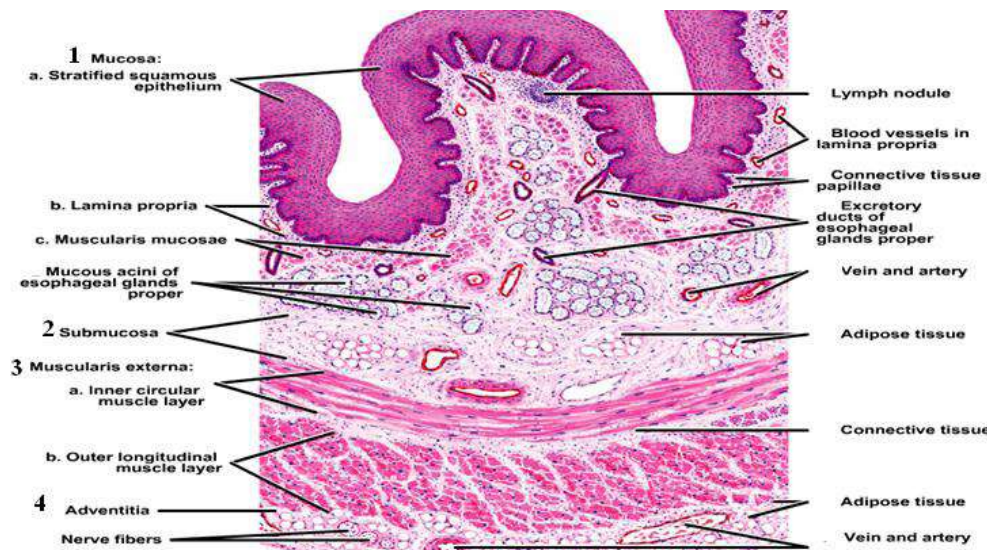
Four layers (mucosa ,Sub mucosa ,Muscularis externa and adventitia) in the esophagus.

1- Mucosa :- Epithelium(Stratified squamous non keratinized epithelium). Lamina propria possesses esophageal cardiac glands that are mucus-secreting

2- Submucosa

3- Muscularis externa is composed of striated muscle in the upper portion of the esophagus, skeletal, and smooth muscle in the middle portion, and smooth muscle in the lower portion.

4- Adventitia. Composed of loose connective tissue.



Stomach

layers of the Stomach

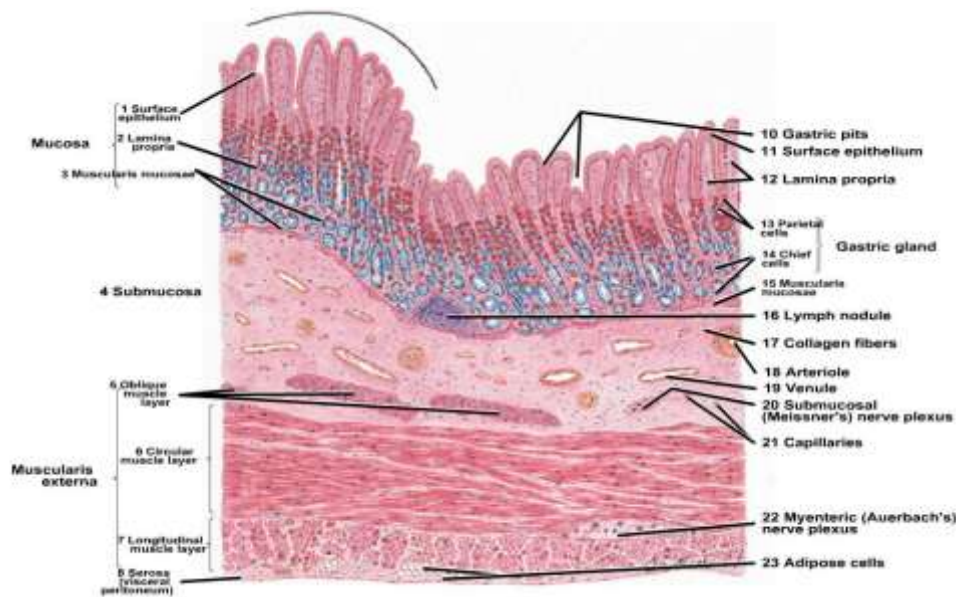
1- Mucosa :- Surface epithelium. Simple columnar epithelium facing the lumen is modified so that all cells secrete mucus, forming a sheet gland that protects , the stomach from its acidic environment.

Gastric pit. A channel formed by the invagination of the surface epithelium into the underlying lamina propria;. Gastric glands:- Simple, branched tubular glands

2- Submucosa

3- Muscularis externa. Internal oblique layer. Middle circular layer . Outer longitudinal layer

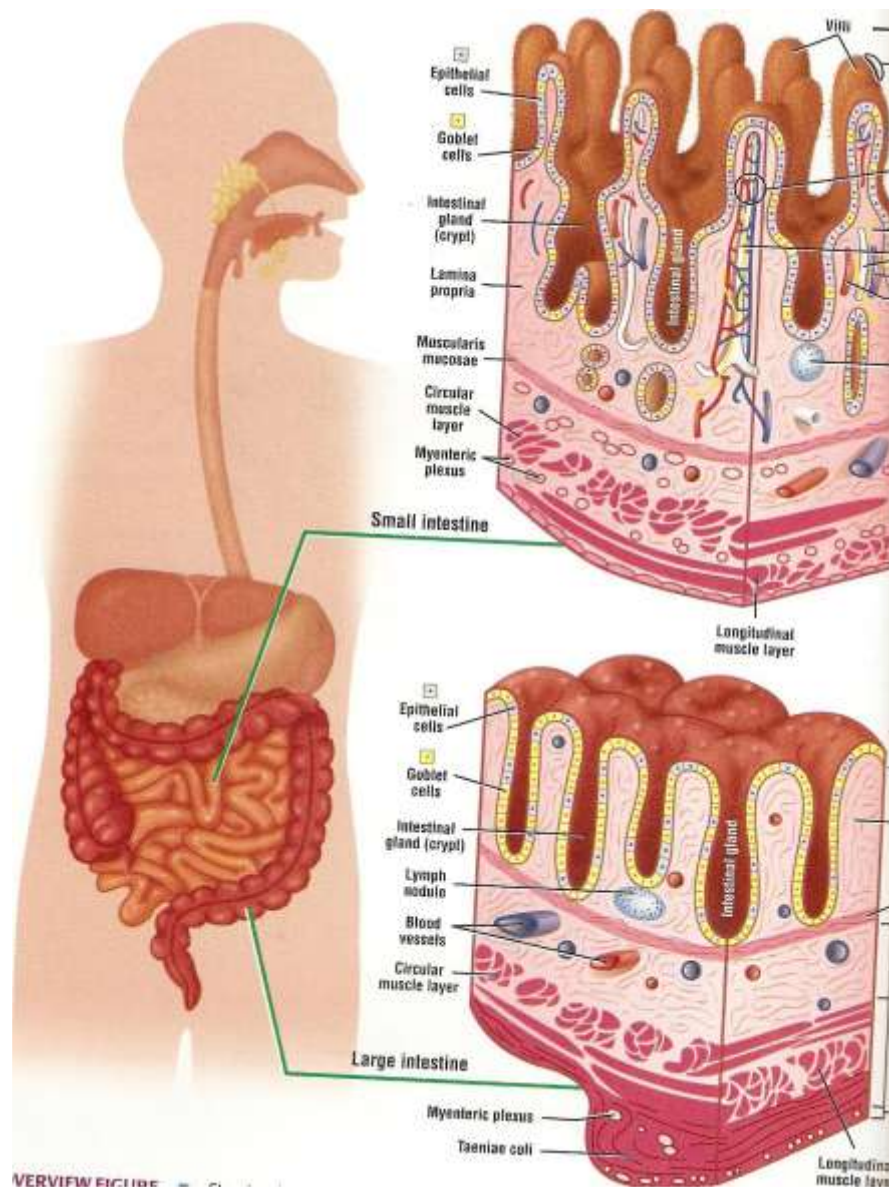
4- Serosa



Gastric glands of stomach

The small intestine

The small intestine is a large convoluted tube approximately 5-7 m in the length :- it is the largest section of the digestive tract . The small intestine extends from the junction with the stomach to join with the large intestine or colon . The small intestine divided into three parts :- the duodenum , jejunum and ileum



The mucosa of the small intestine exhibits specialized structural modifications that increase the cellular surface area for the absorption of nutrients and fluids. The modifications include:-

1. The plicae circulares are permanent, spiral folds or elevations of the mucosa with submucosa that extend into the intestinal lumen.
2. Villi are permanent, finger-like projections of the lamina propria of the mucosa that extend into the intestinal lumen. They are covered by simple columnar epithelium and contain lymphatic and blood capillaries and strands of smooth muscles.

3. **Microvilli are cytoplasmic extensions that cover the apices of the intestinal absorptive cells they are visible microscope as a striated (brush) bord**

Small intestine (duodenum)

- Characterized by found numerous of duodenal glands in the Submucosa called (Bruuner s glands)and also in the lamina propria and in the Submucosa founds less numbers of lymphatic nodules .**
- Muscularis externa characterized by the inner longitudinal and the outer circular smooth muscles.**

Small intestine (jejunum)

- Characterized by found the plica circularis (10), and few number of lymphatic nodules in the Submucosa(without duodenal glands) .**
- Muscularis externa characterized by inner circular and outer longitudinal smooth muscle.**

The small intestine (ileum)

- Characterized by numerous of lymphoid nodules as a peyers patches in the Muscularis mucosa (Muscularis mucosa disrupted in the ileum).**
- Muscularis externa inner circular and the outer longitudinal smooth muscles.**

Large intestine(colon):-

The colon dose not have Villi or plice circulares and found temporary folds .In the lamina propria and Submucosa of the colon are lymphatic nodules . The simple columnar epithelium contains are absorptive columnar cells and the mucous filled goblet cells , which increase in number toward the terminal end of the colon ..The lamina propria and Submucosa are filled with aggregation of the lymphoid cells and lymphatic nodules . Inner circular and outer longitudinal smooth muscles of the Muscularis externa



The accessory glands of the digestive system

Liver

the liver tissue consist of multiple lobules , The center of each hepatic lobule is the central vein ,within the lobe are plates of hepatic cells that radiate from the central vein toward the periphery .Located between the hepatic plates are the hepatic sinusoids , and are incompletely lined with endothelial cells ,also in the sinusoid wall are fixed macrophage called the Kupffer cells. *Bile is formed in the liver cells and drains through the bile canaliculi in the opposite direction into the interlobular bile ducts . The hepatic cells (hepatocytes) Cells are polyhedral in shape, one or two nuclei.

