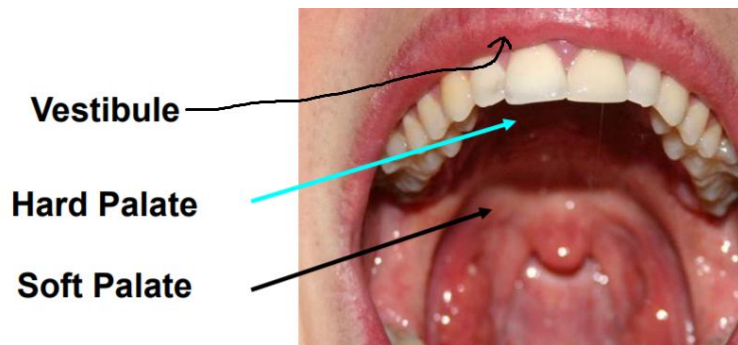


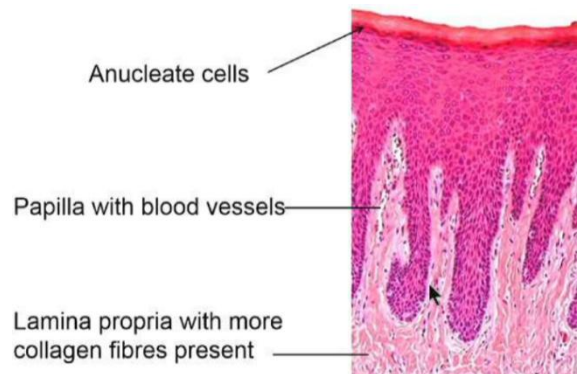
# BMED2405

## Histology of the Upper GIT

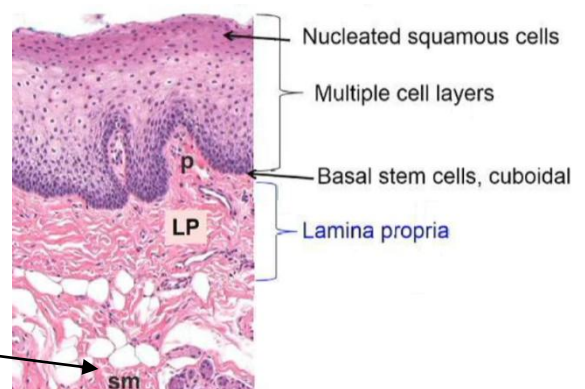
### Oral Cavity



- Gums (gingiva) and Hard Palate lined with **masticatory mucosa** (keratinized stratified squamous epithelium and lamina propria)
  - Undulating surface for grip



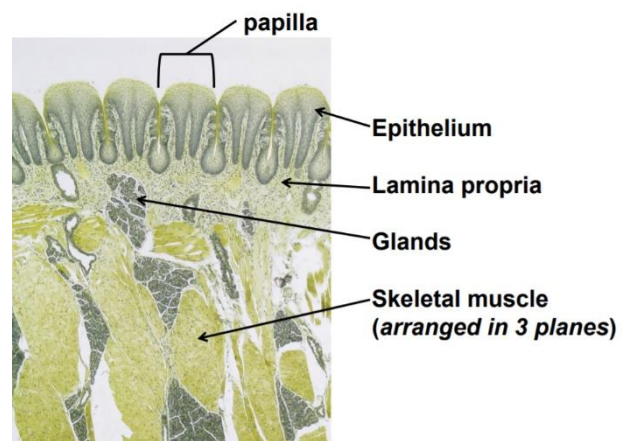
- Cheeks, lips, inferior tongue, soft palate lined with **lining mucosa** (Non-keratinized stratified squamous epithelium with lamina propria)
  - Lots of undulating layers
  - Smooth muscle
  - Adipocytes



- Dorsal tongue lined with **specialized mucosa** (stratified squamous epithelium with papillae and taste buds with lamina propria)

### Tongue

- Covered in **papillae**
- Has **serous and mucous salivary glands**
- Has taste buds on the papillae
- Has **skeletal muscle**
- Has adipocytes
- **Non-keratinized squamous epithelium**



Sweet, bitter and savoury triggered by molecules binding to receptors. Salty and Sour triggered when alkali metals enter taste buds and  $H^+$  are perceived to enter

- Taste Buds

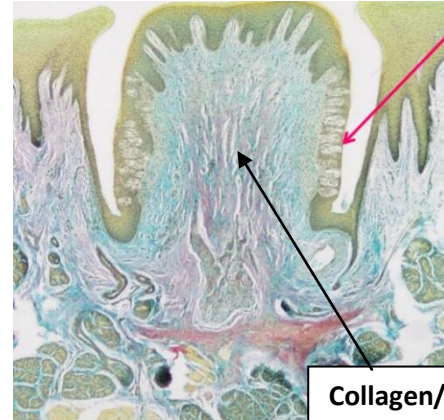
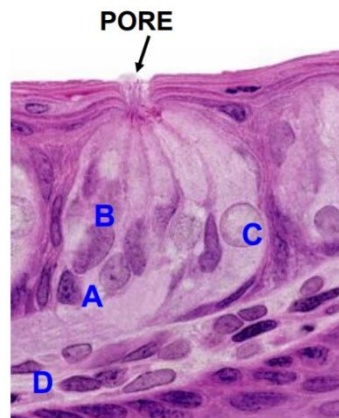
- Sensory cells are paler and more euchromatic (active)
- Support cells are darker and more heterochromatic (less active)
- Support cells and sensory cells are both columnar epithelium

A BASAL CELL

B SUPPORT CELL

C SENSORY CELL

D branches of the FACIAL NERVE (CN VII)

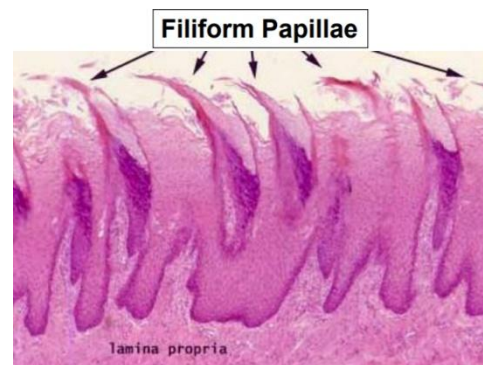


Collagen/Connective tissue

- Tongue Shapes

- Filiform

- Have long papillae pointing anteriorly for mastication
- Made of stratified squamous epithelium
- Don't have taste buds



- Fungiform Papillae

- Mushroom shaped
- Have taste buds

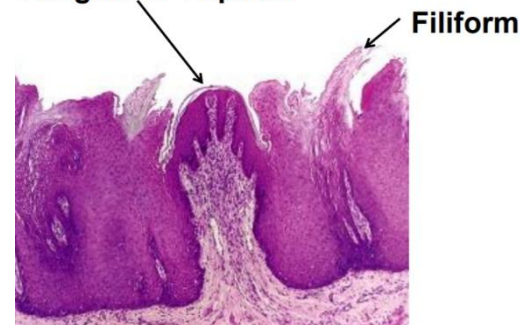
- Foliate papillae

- Are parallel with low ridges
- Have taste buds
- Usually have 3 lamina propria protrusions

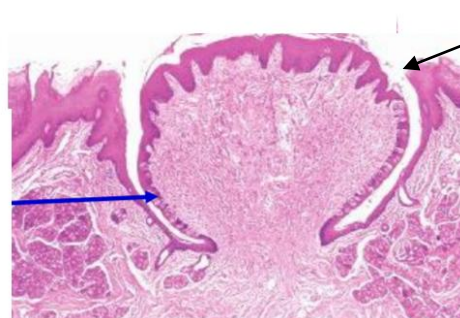
- Circumvallate papillae

- Large and dome shaped
- Have taste buds

Fungiform Papillae



Filiform on surface





## Glands

### Foliate

SIMPLE  
BRANCHED  
ACINAR



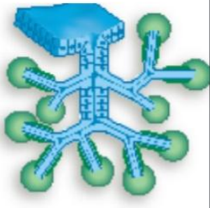
COMPOUND  
ACINAR



COMPOUND  
TUBULAR

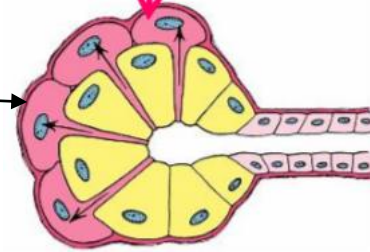


COMPOUND  
TUBULO-ACINAR



- Classification

- Can be serous, mucous or mixed
- Mixed secretions have a serous demilune shape

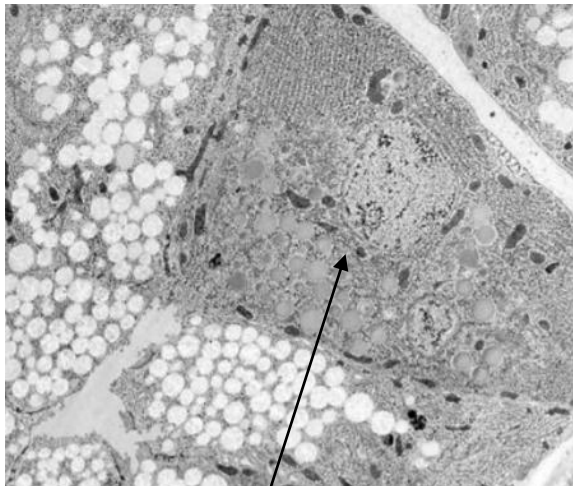


- Serous cells

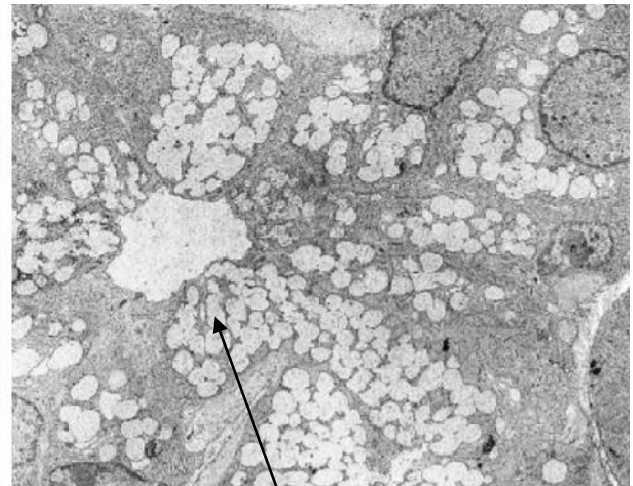
- Have a **pyramidal shape**
- Have **prominent golgi apparatus, sER and secretory granules (Zymogen granules)**
  - Located at the apical portion of the cell cytoplasm
- Release can be passive, hormonal, etc...

- Mucous cells

- Mucous stored in **mucinogen granules in the apical region** of the cell cytoplasm

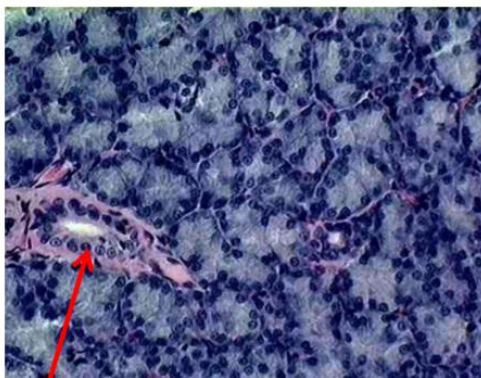


Serous cell



Mucous cell

## Serous



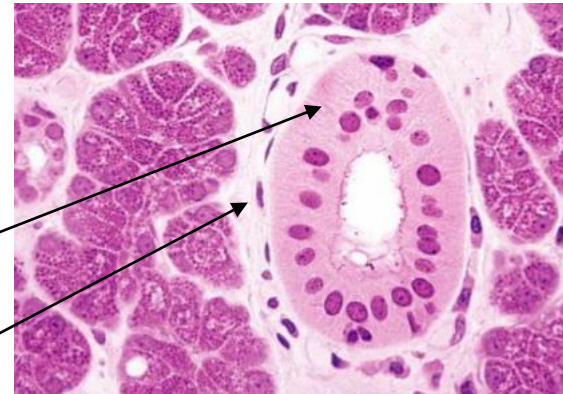
duct

## Mucous

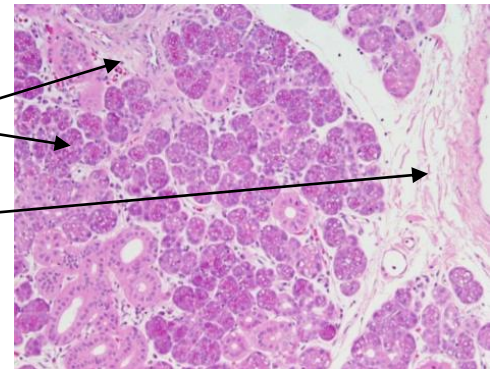


duct

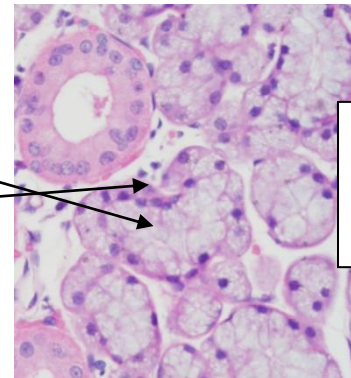
- Myoepithelial cells
  - **Contractile cells** that move secretions towards excretory ducts
  - **Between epithelial cells and basement membrane**
- Intercalated ducts
  - Lined with **simple cuboidal epithelium**
  - More common in **serous glands**
- Striated ducts
  - Lined with **simple cuboidal to columnar epithelium**
  - Lots of **plasma membrane infoldings** creates the striated appearance
  - Reabsorbs and modifies secretions using energy so has many mitochondria
  - Surrounded by myoepithelial cells



- Parotid gland
  - **Serous secreting only**
  - Have many **long-intercalated ducts**
  - Have large amounts of fatty adipose
  - Connective tissue
  - Collagen
  - **Myoepithelial cells** on outside of glands



- Sublingual gland
  - **Mucous glands dominate**
  - **Intercalated ducts are small**
  - **Has more tubular than acinar glands**
  - **Demilune artefact**



Demilunes  
will appear as  
a clumping of  
darker cells

- Submandibular gland
  - **Mixed serous and mucous gland**
    - Mostly serous
  - No adipose cells

## Gastrointestinal Tract Wall

- Mucosa
  - Has multiple cell layers with **tight junctions**
  - Can sometimes have **microvilli** for **absorption**
  - Can have **glands** and **goblet cells** for **secretions**

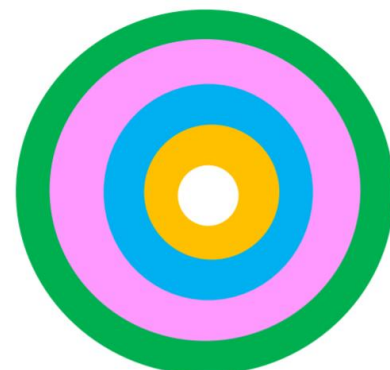
### 4 layers:

**Mucosa**

**Submucosa**

**Muscularis externa**

**Serosa or Adventitia**

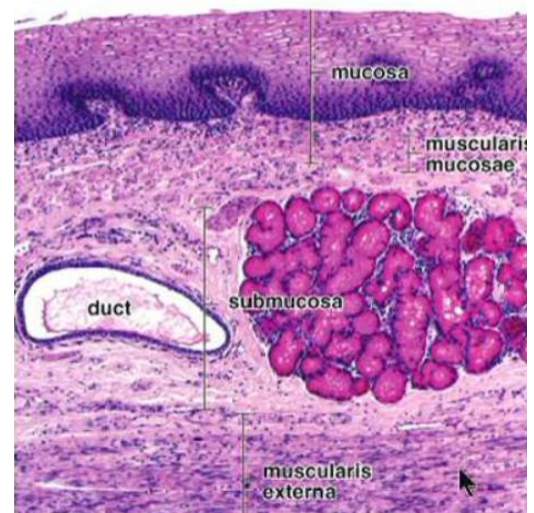
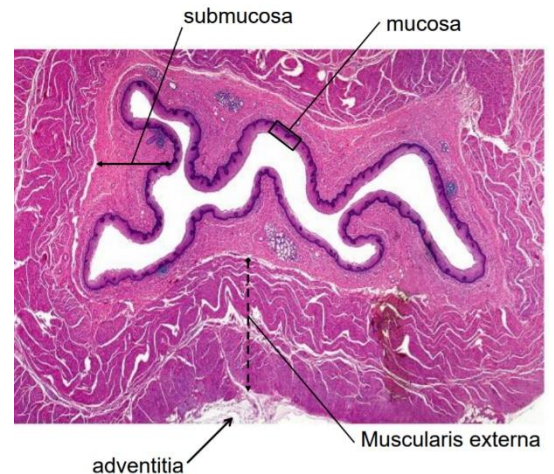




- Has a **lamina propria** with **loose connective tissue, blood vessels and immune cells**
- Has a circular layer of **smooth muscle muscularis mucosa**
- Submucosa
  - **Dense irregular connective tissue**
  - Can have glands and lymph nodes
  - Has peripheral **nerve plexi** and vessels
- Muscularis externa
  - Has **smooth muscle arrangements**
  - Used for **peristalsis** (food movement)
  - Has peripheral nerve plexi
- Serosa
  - This is when there is a **free surface or mesentery!**
  - **Simple squamous epithelium (mesothelium)**
  - Loose connective tissue
  - Adipocytes (fat deposits)
- Adventitia
  - When there is **no free surface**
  - No epithelium layer
  - Loose/Dense connective tissue

## Oesophagus

- Mucosa
  - **Stratified squamous epithelium**
  - Thick **muscularis mucosa** at bottom, thin at top
  - **Dense irregular connective tissue**
- Submucosa
  - Has many **mucous glands** for lubrication
  - Has ducts
- Muscularis Externa
  - **Skeletal muscle in the upper oesophagus** for voluntary swallowing
  - **Smooth muscle in the lower parts** is involuntary
  - Adventitia on the outside



Has longitudinal muscle and circular muscle for moving boluses of food to the stomach

The gastro-oesophageal junction is a rare area where the epithelium changes suddenly from one type to another instantly

## Anatomy of the Upper GIT

### Oral Cavity

