DIGESTIVE SYSTEM

HISTOLOGY

Semester 2, Year 2 ·

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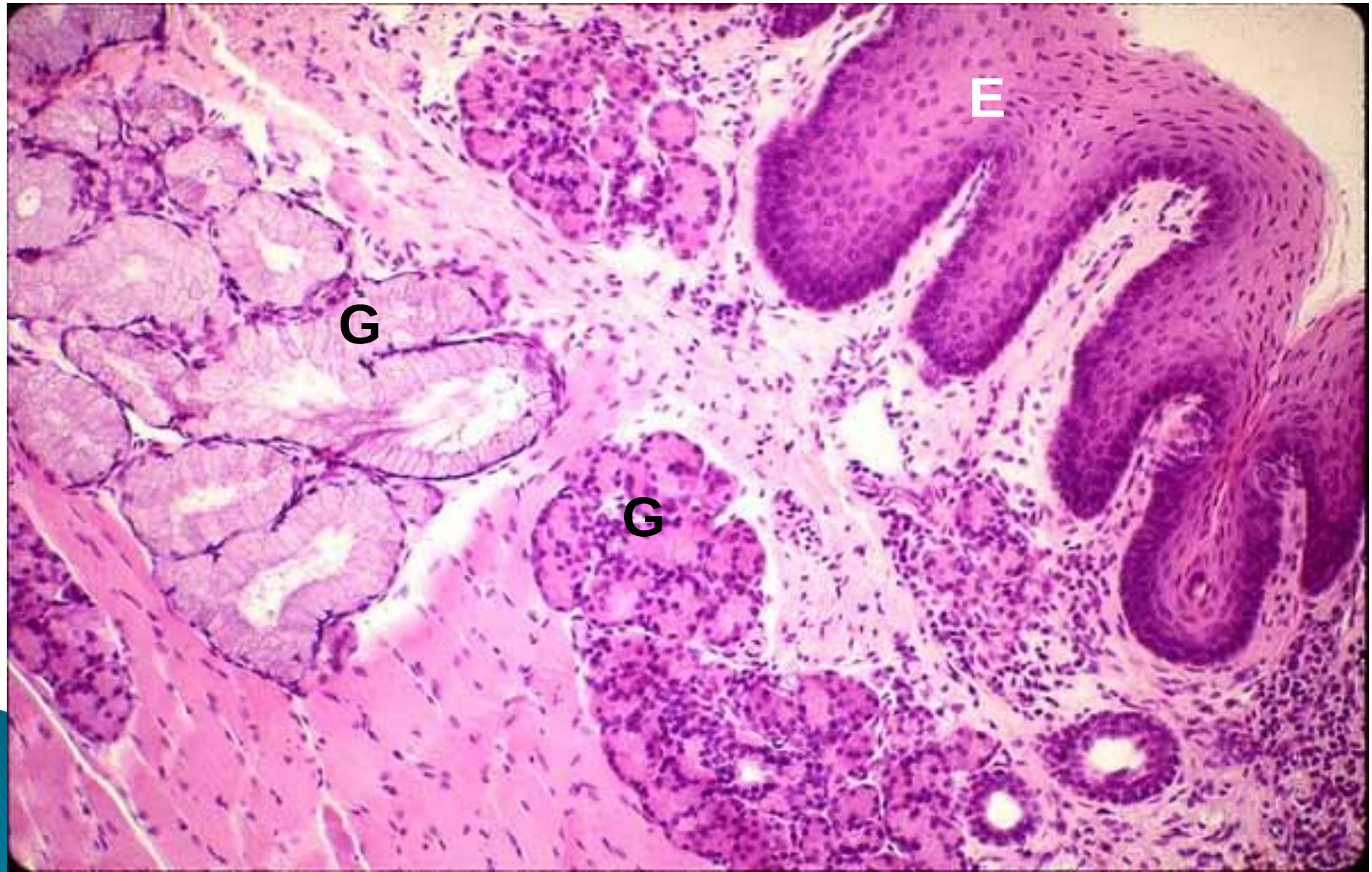
Associate professor of Human histology & Cell Biology

➢ Lip & Tongue

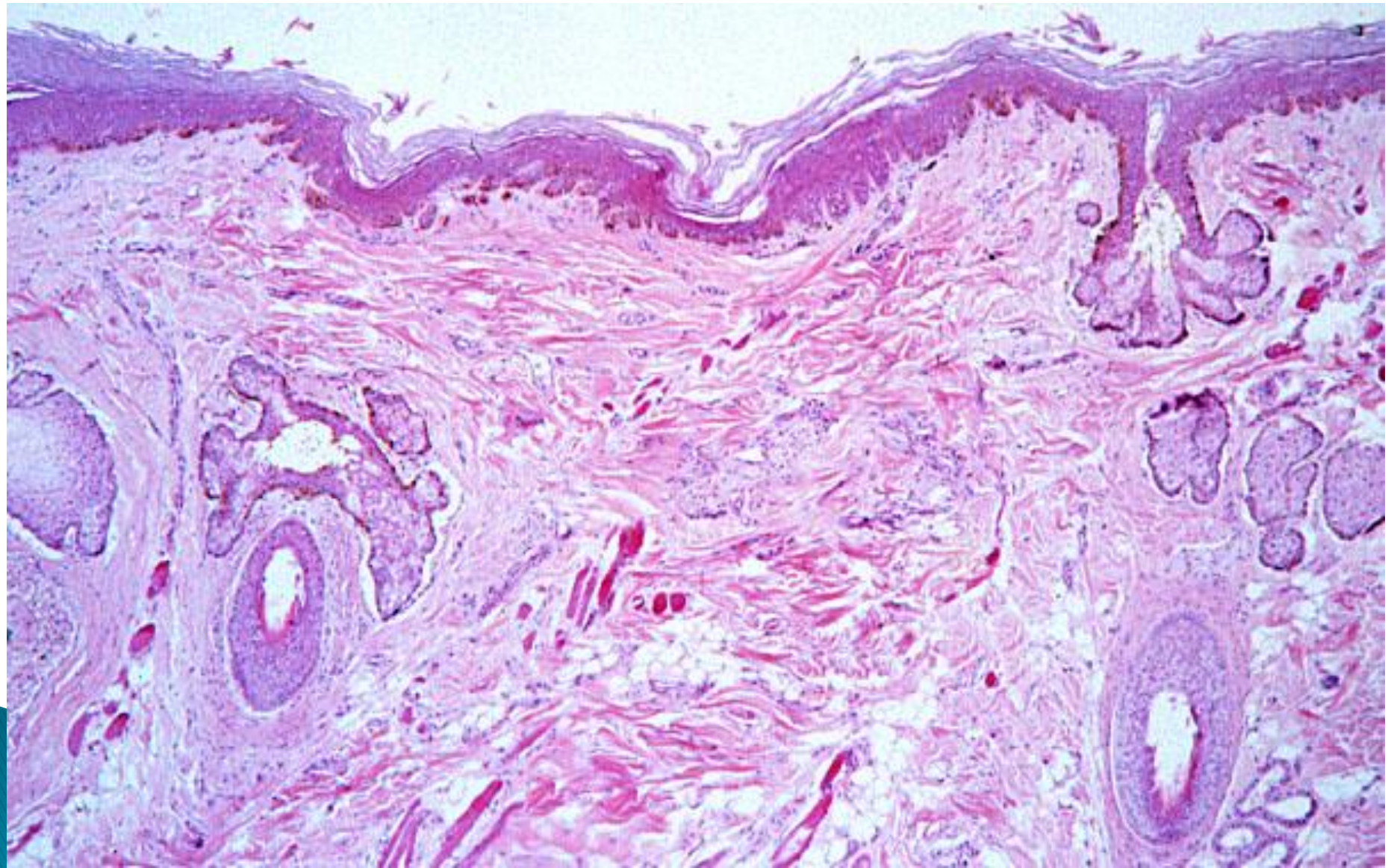
Oral Mucosa

-Non-Keratinized stratified squamous epithelium (E)

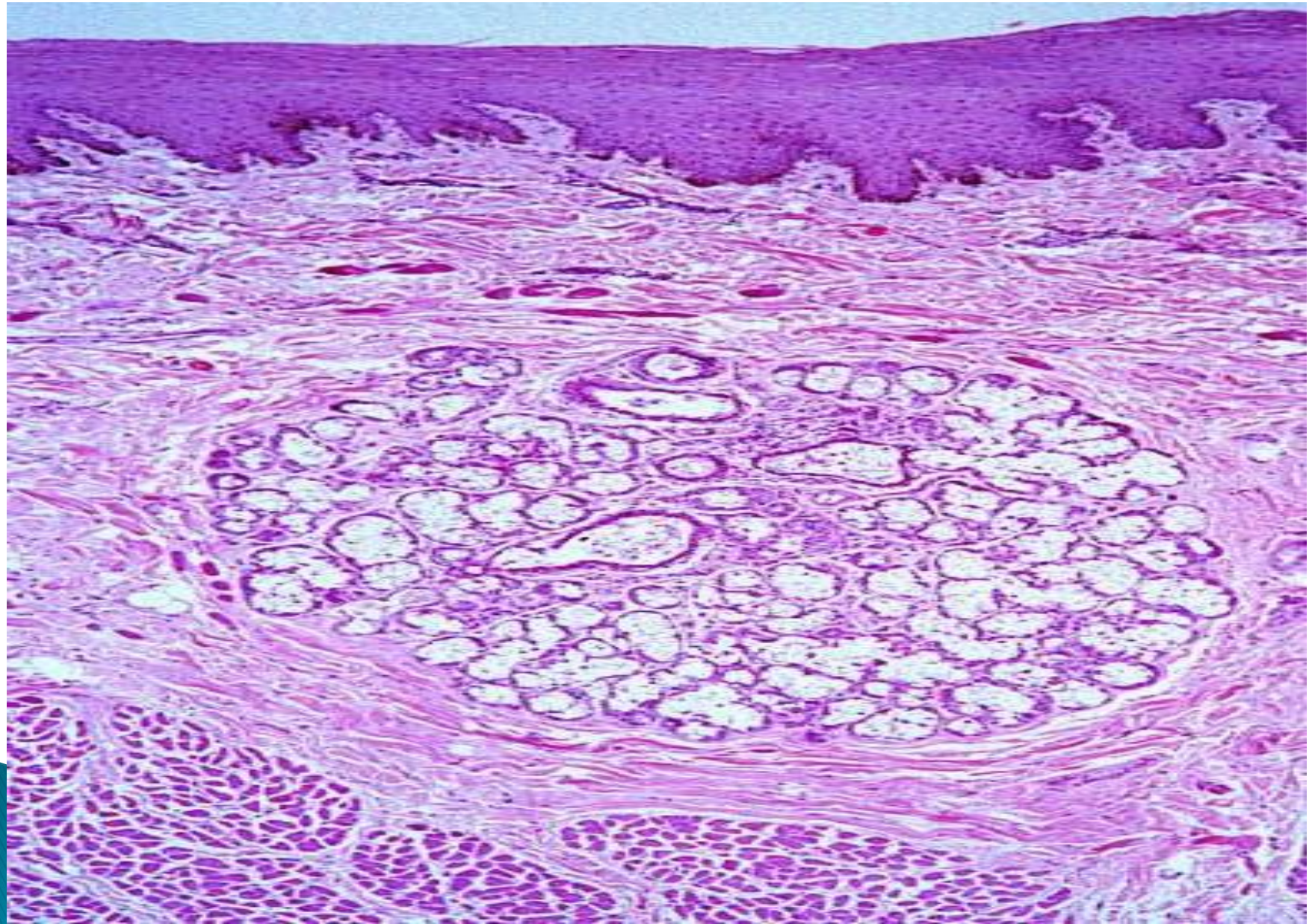
- Lamina propria: minor salivary glands (G)



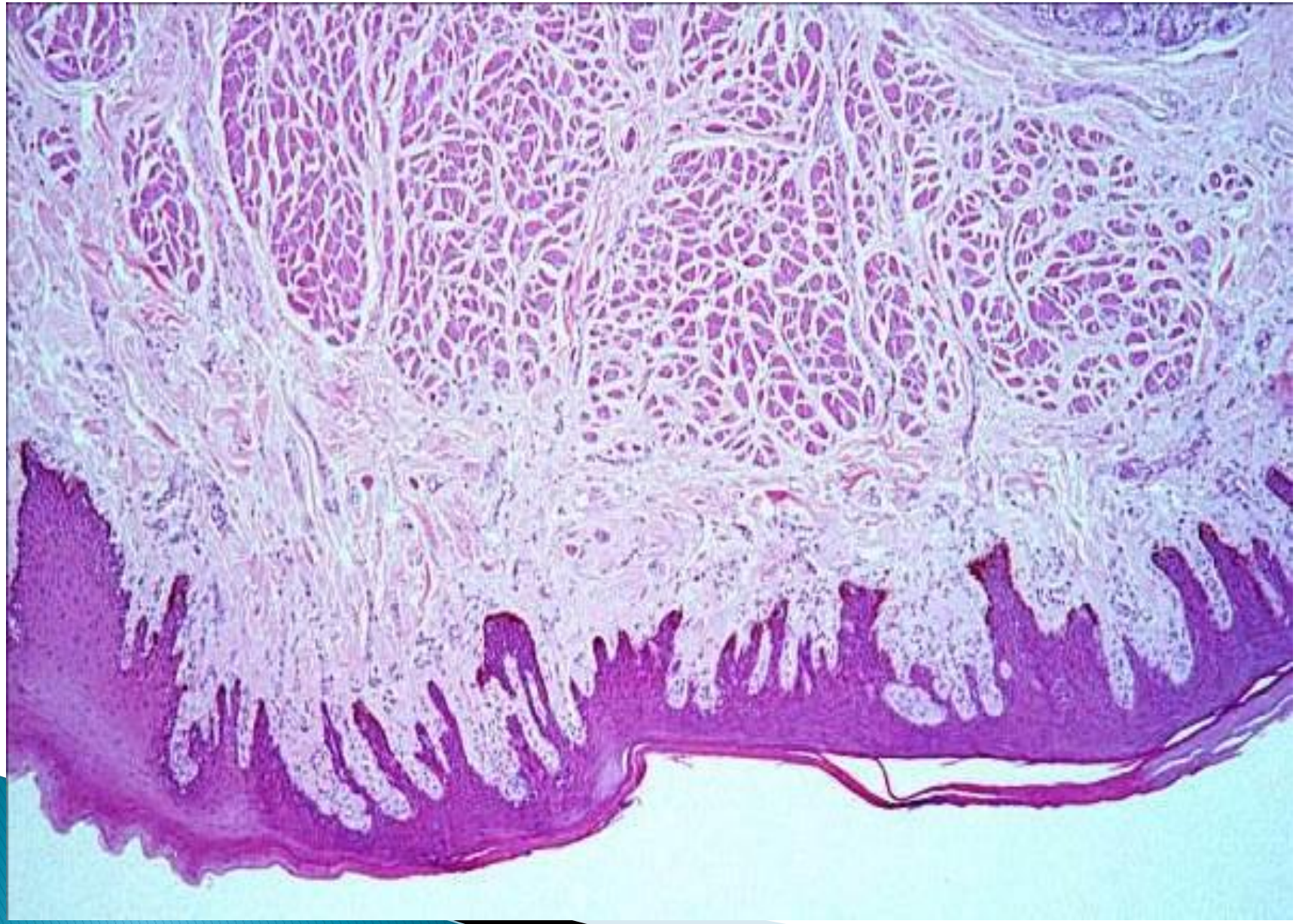
Outer (hairy) surface of Lip



Inner Surface of Lip (labial glands)

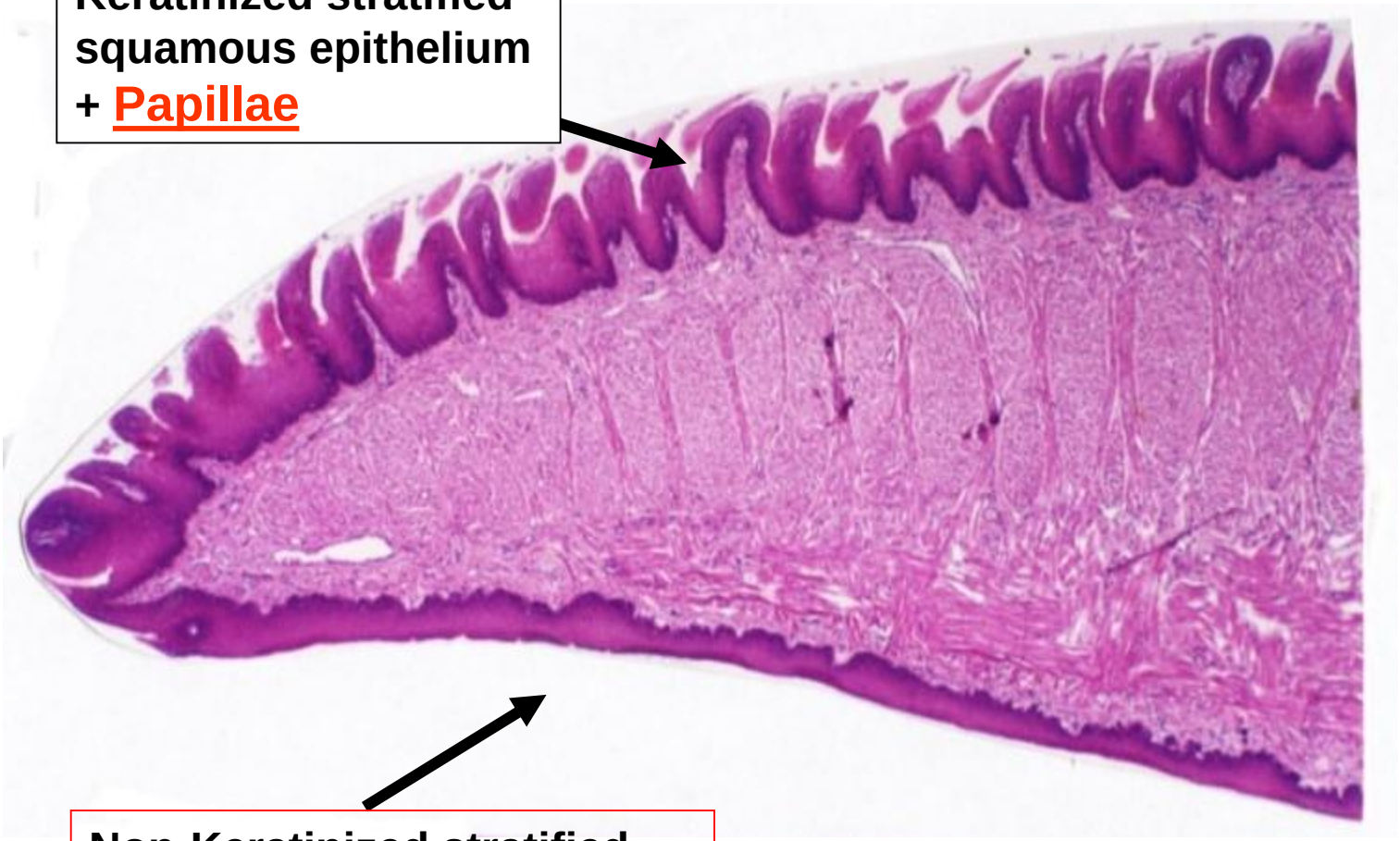


Red Line (Vermilion Border)



Tongue

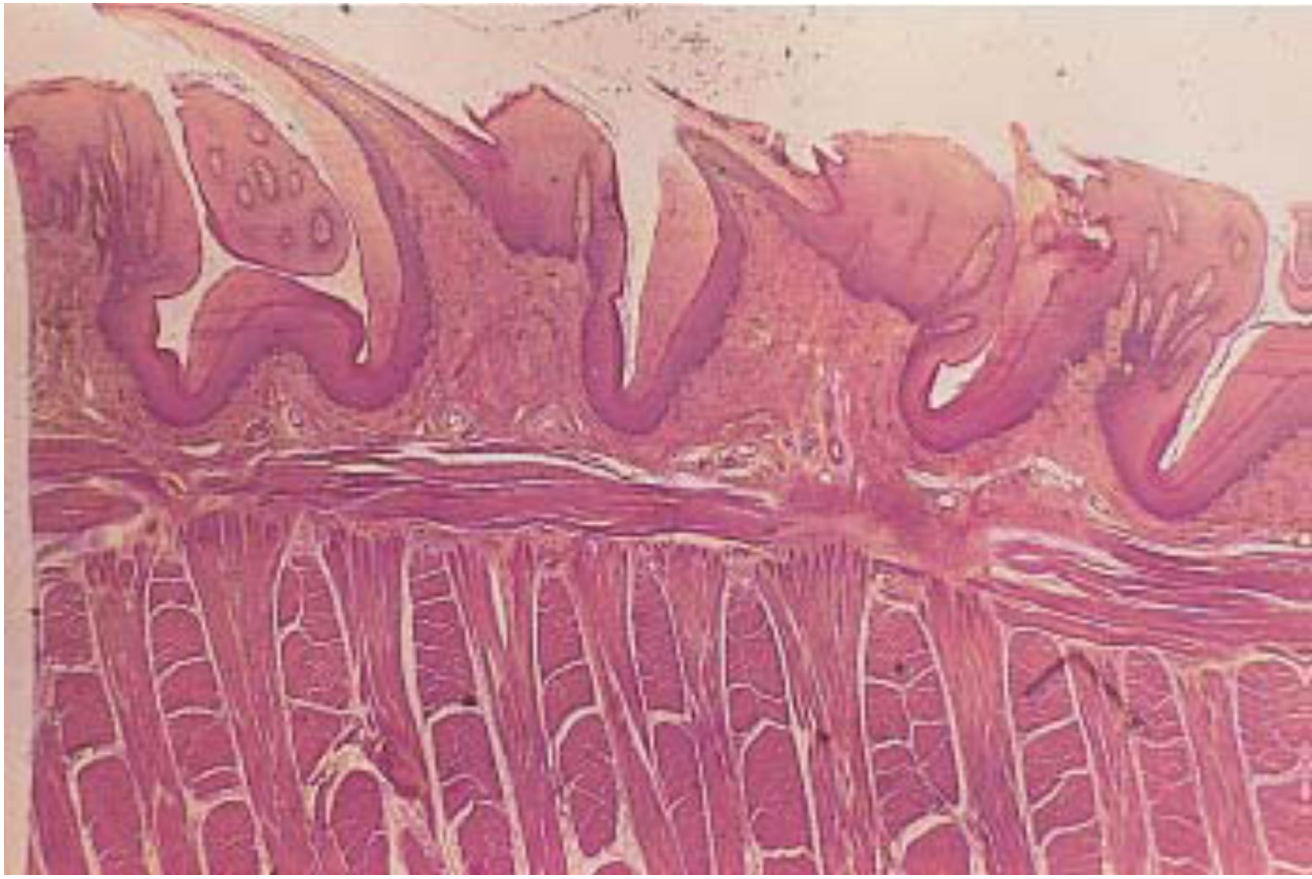
Keratinized stratified squamous epithelium + Papillae



Non-Keratinized stratified squamous epithelium. No papillae

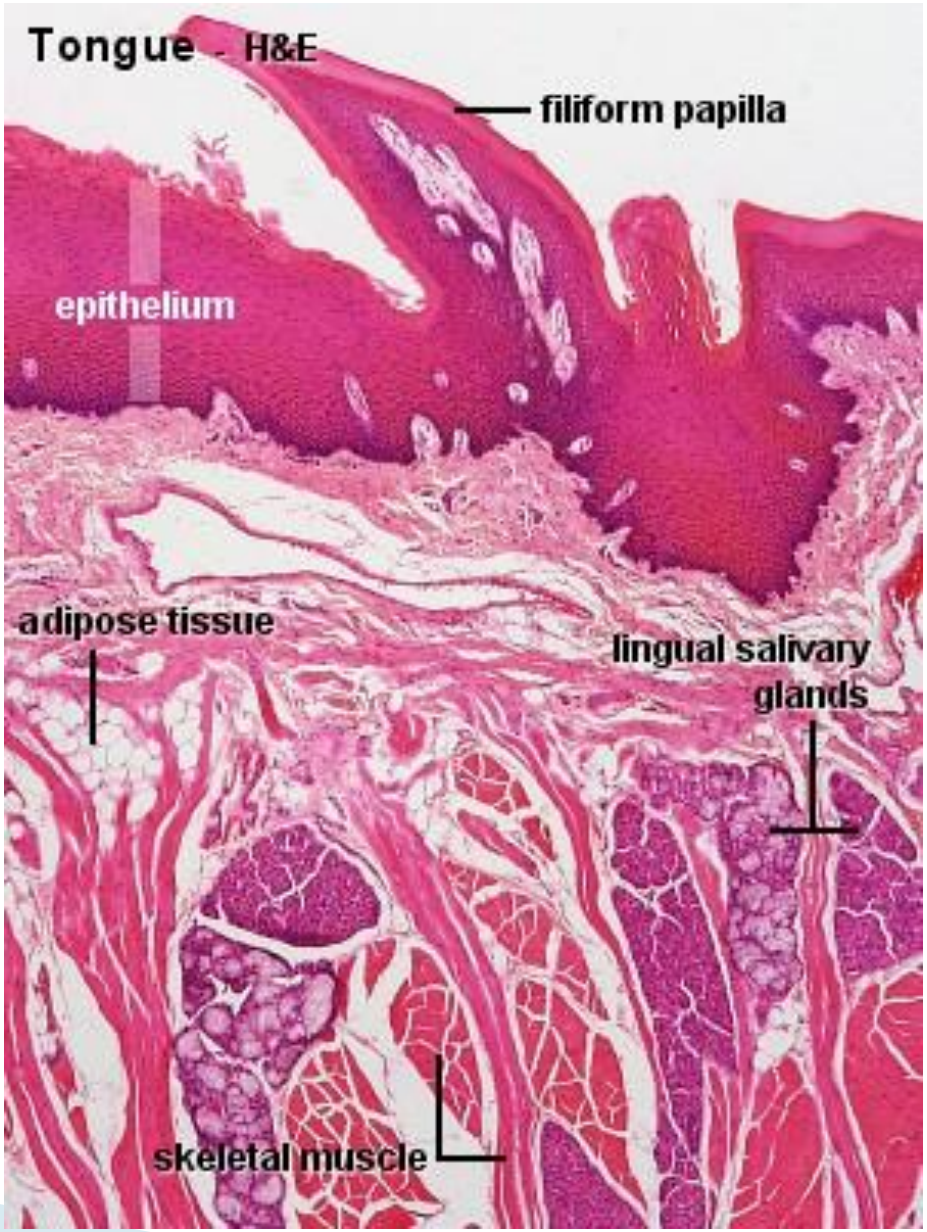
Skeletal muscles of Tongue

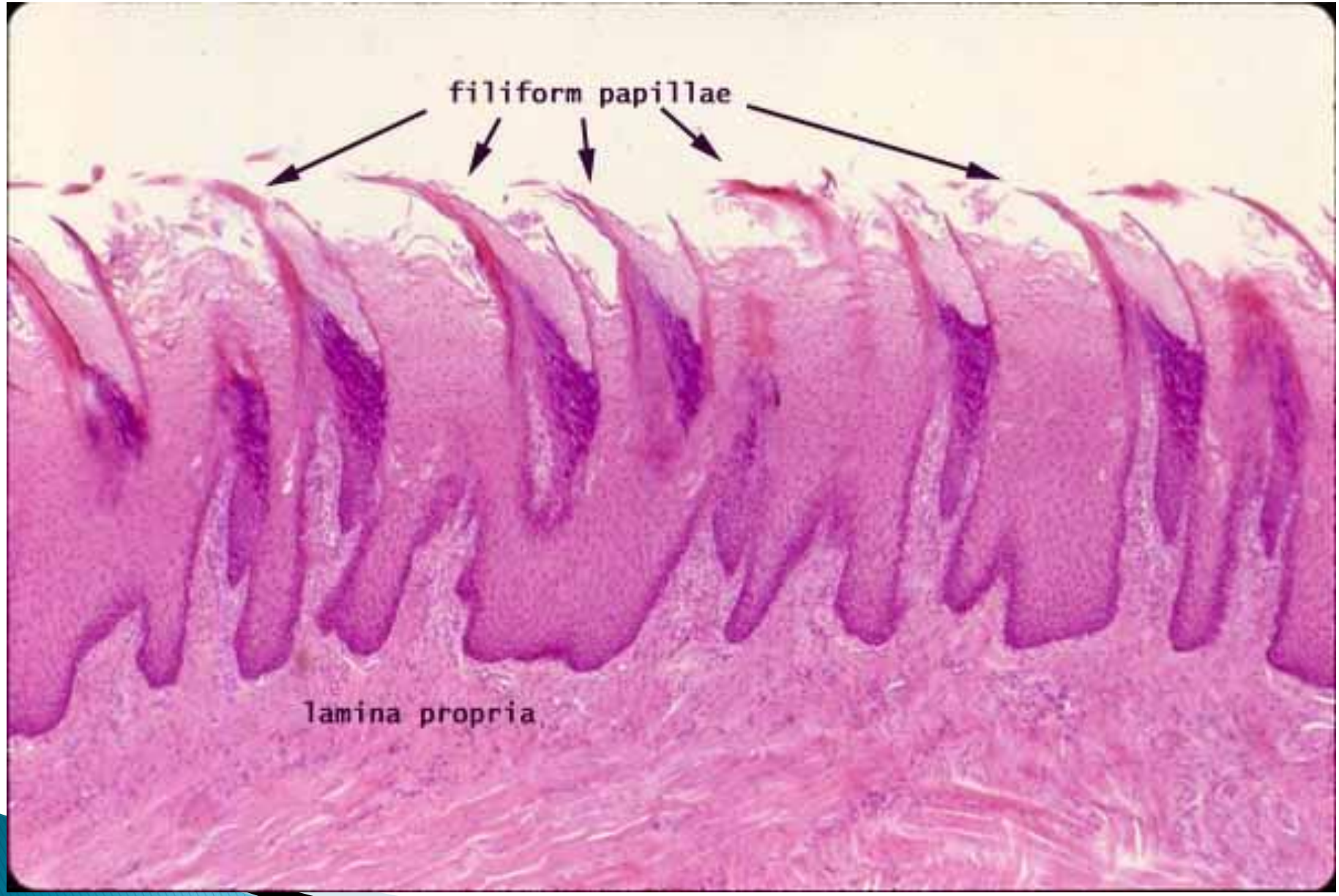
- Vertically
- Horizontally
- Longitudinal



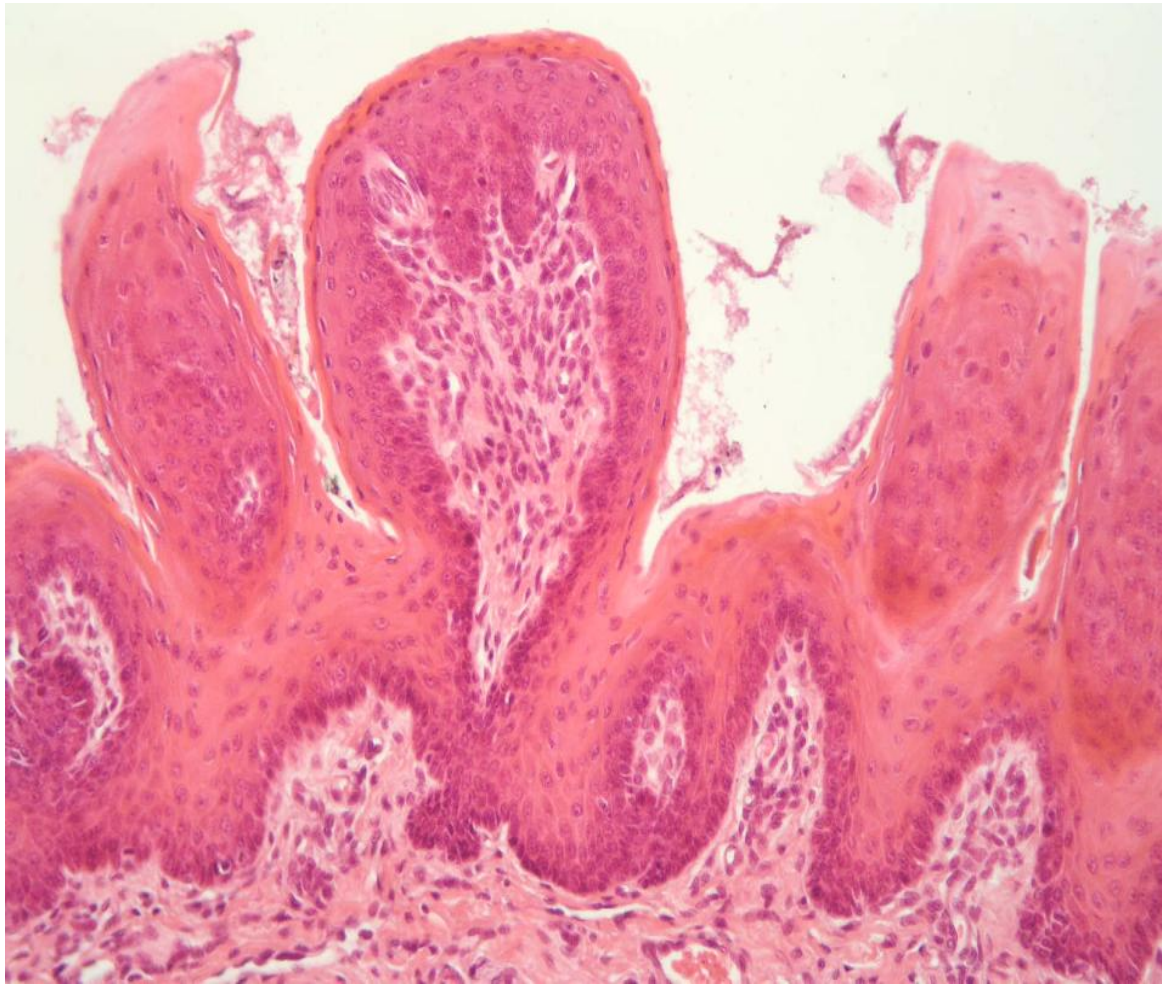
Filiform Papillae

- Note the Lingual (Minor) Salivary glands



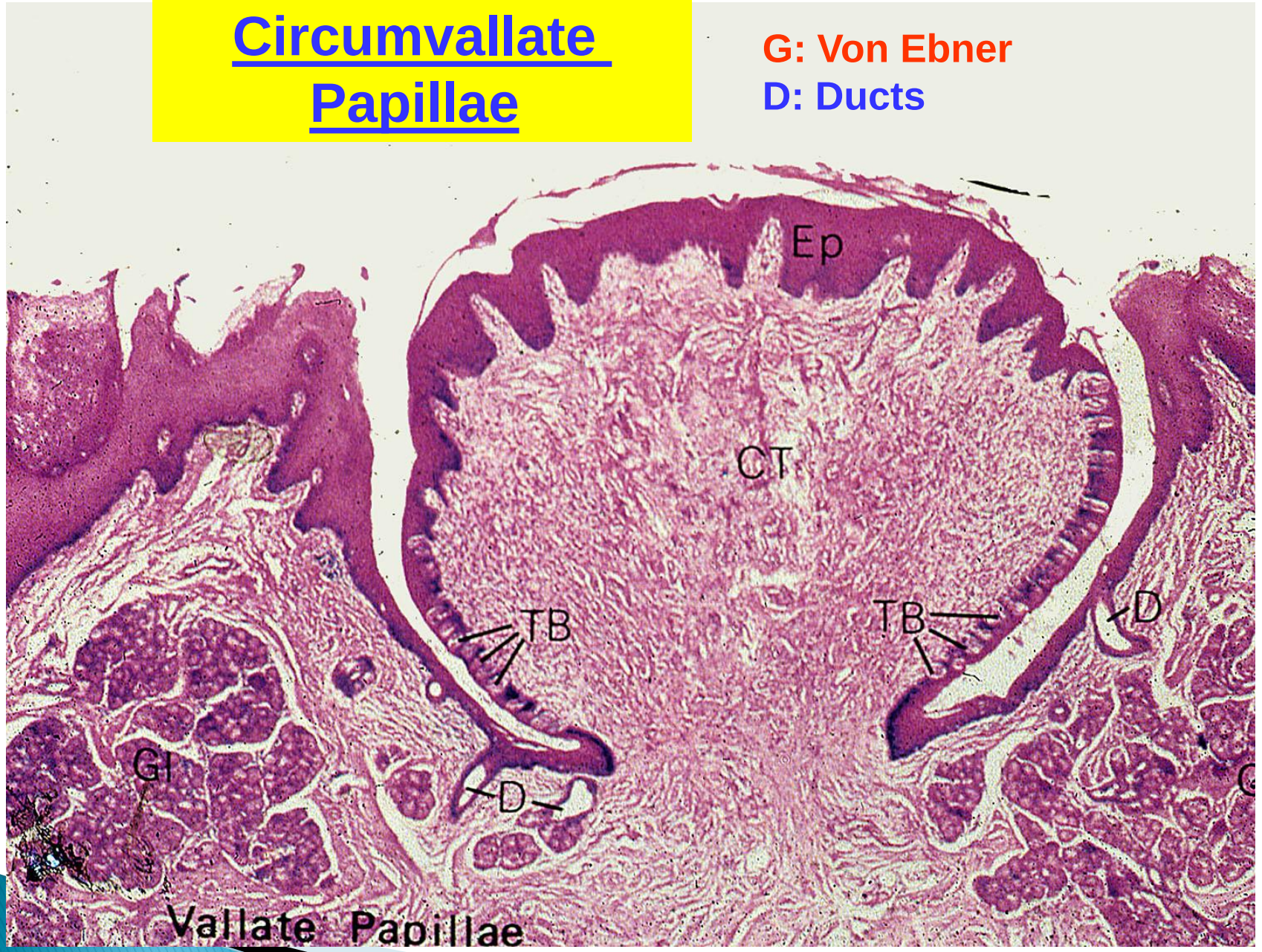

filiform papillae
lamina propria

Fungiform Papillae



Circumvallate Papillae

G: Von Ebner
D: Ducts



Tongue Rabbit

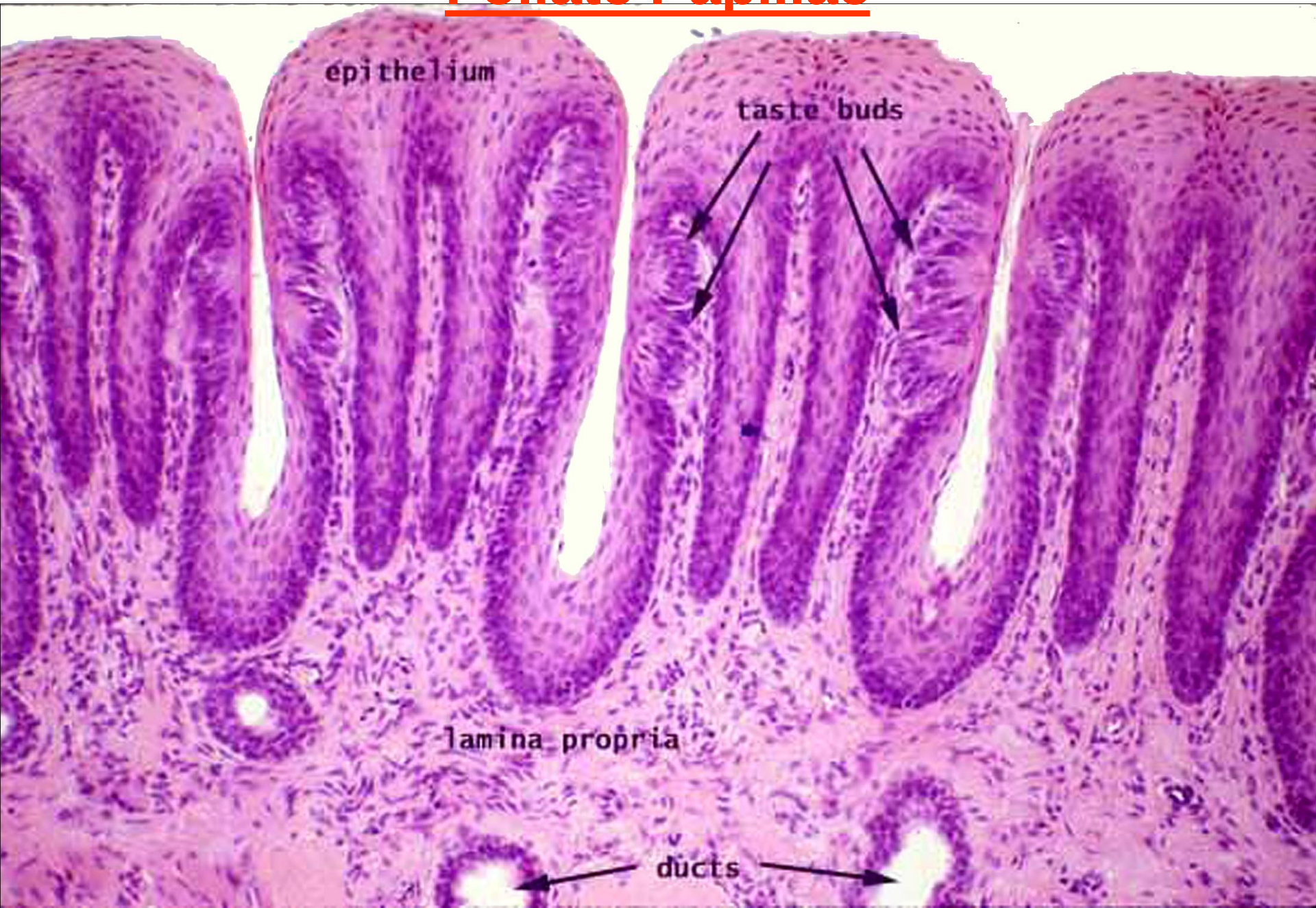
Foliate Papillae

*Non-keratinized stratified Squamous epithelium

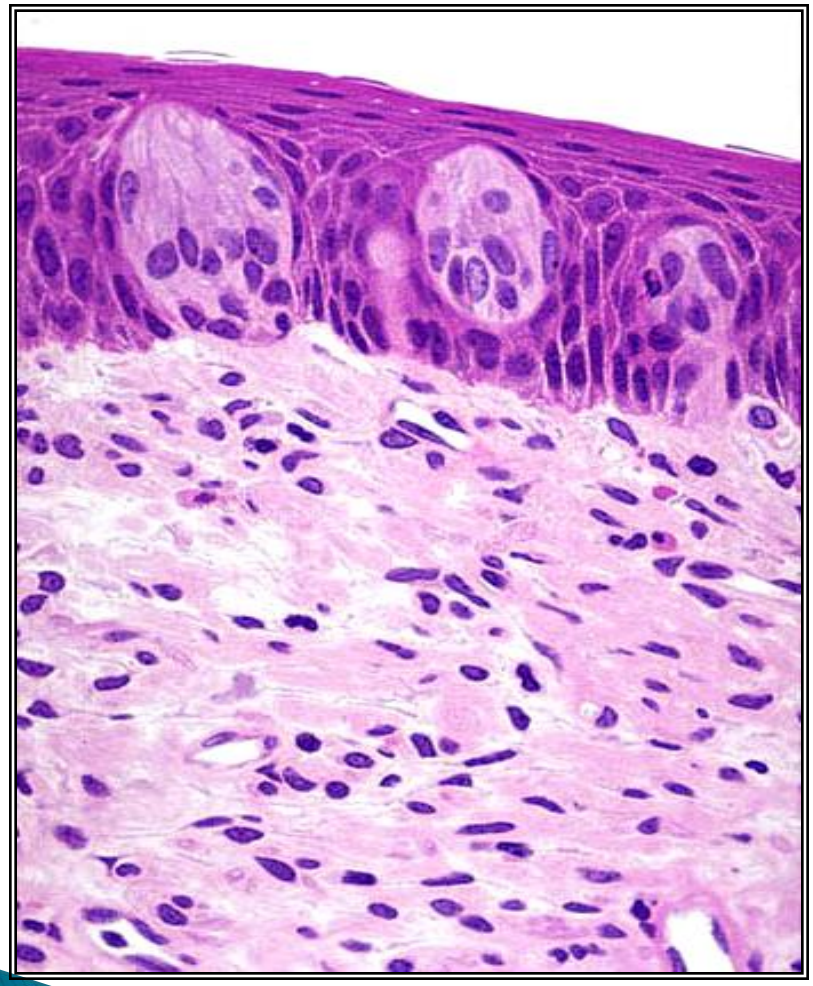
*Many Taste Buds

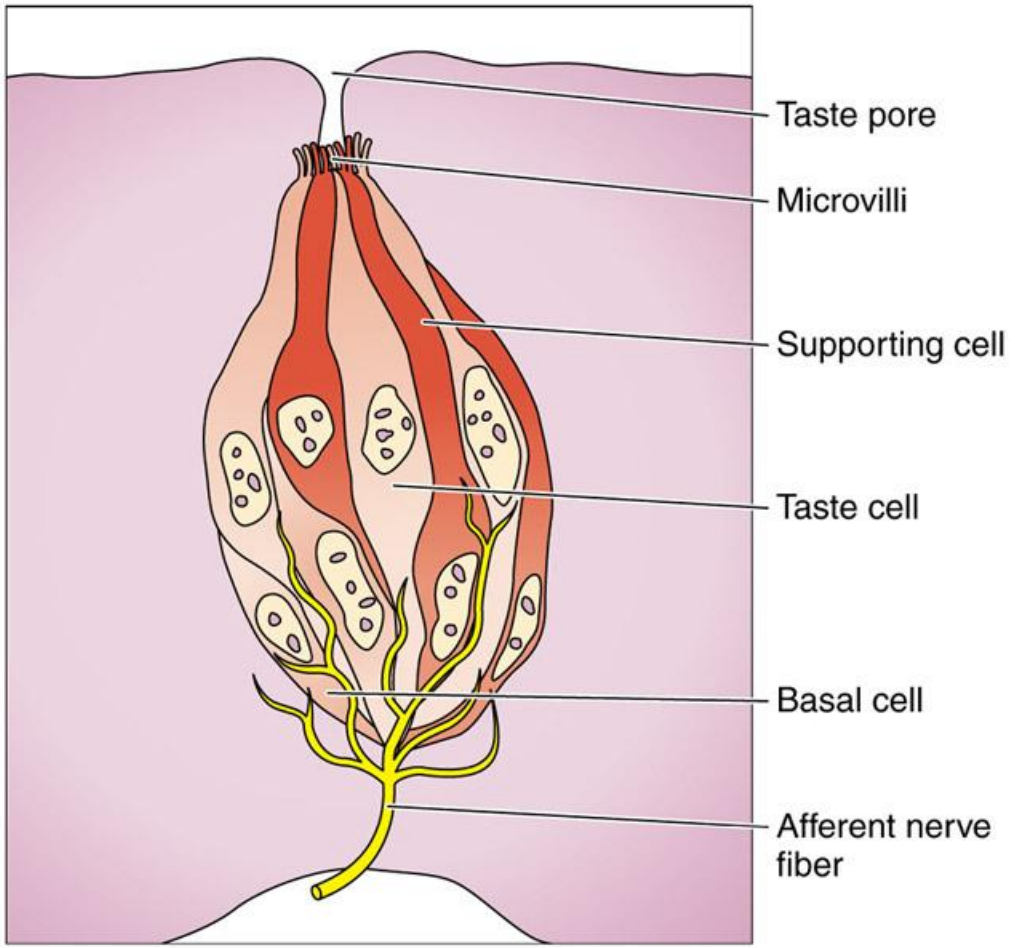
*Serous Glands

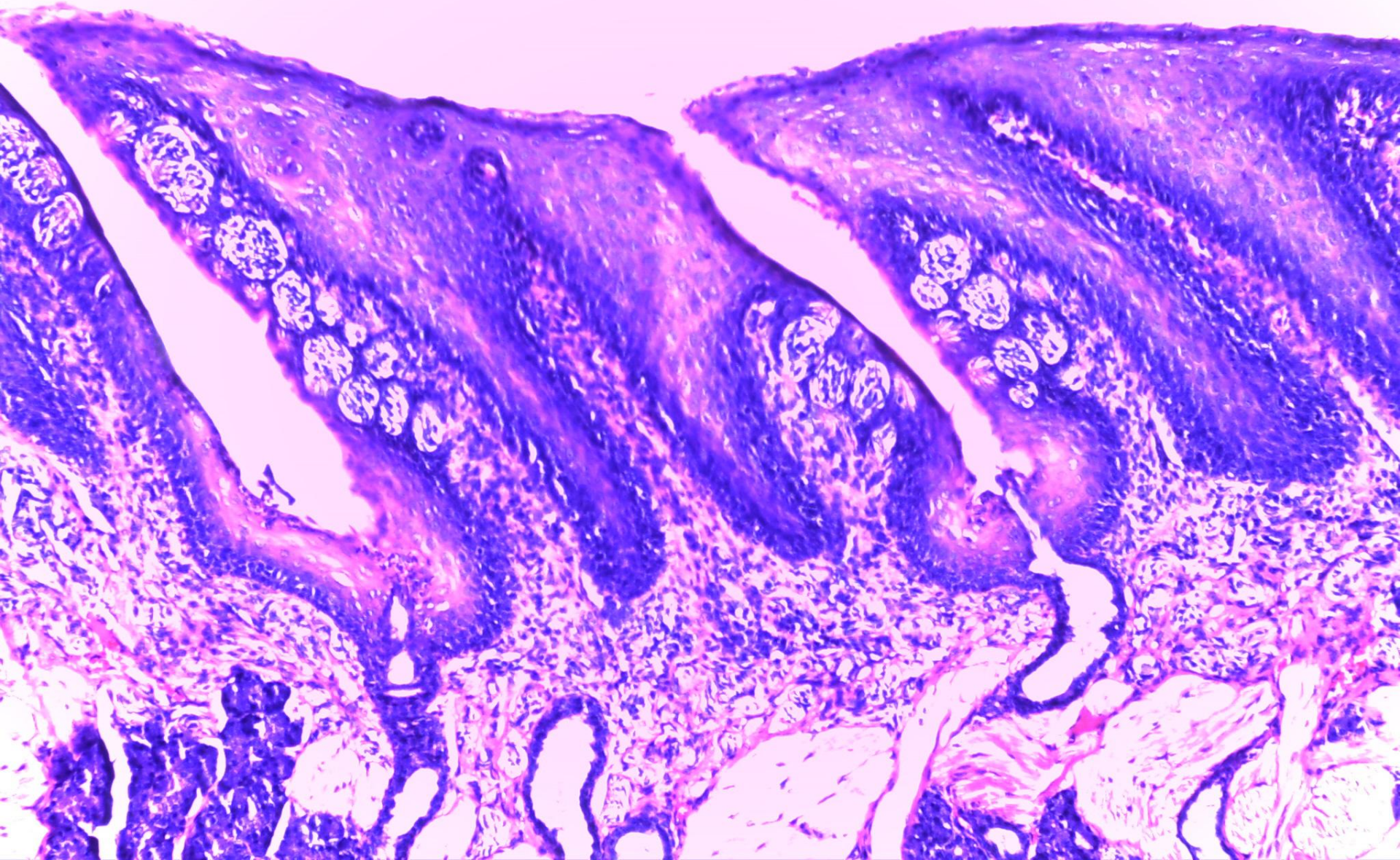
Foliate Papillae



TASTE BUDS



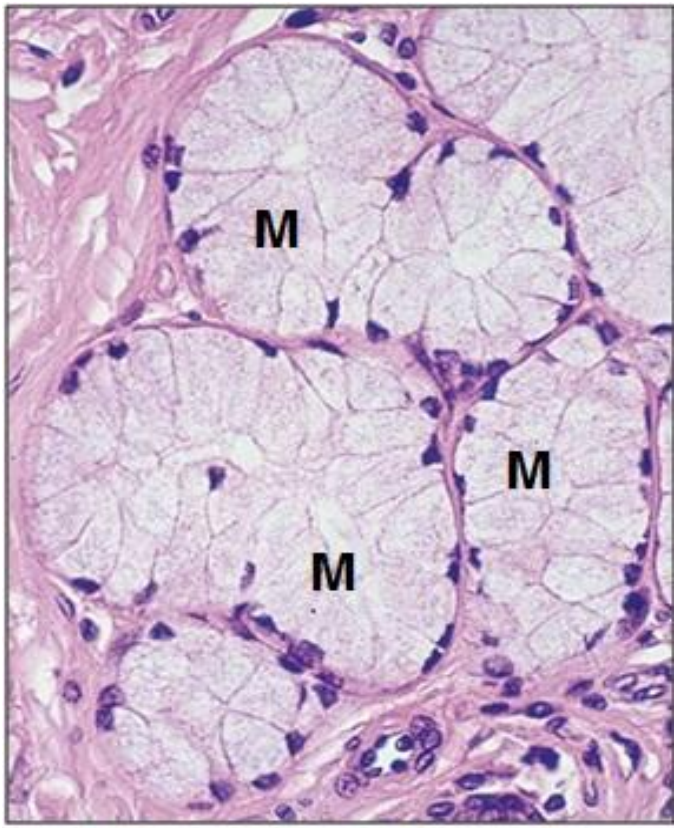

Taste pore
Microvilli
Supporting cell
Taste cell
Basal cell
Afferent nerve fiber



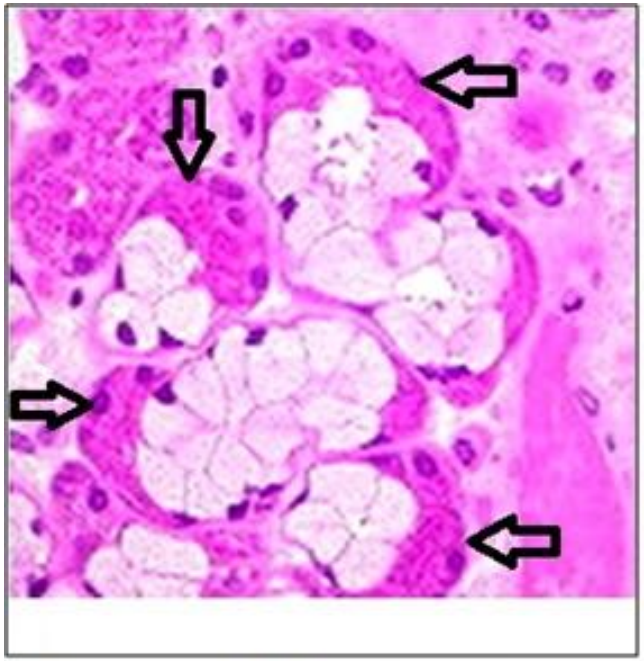
Salivary Glands

Types of Acini in Salivary Glands

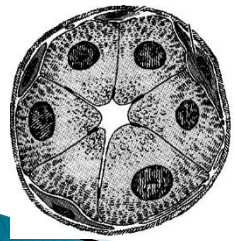
Serous Acinus

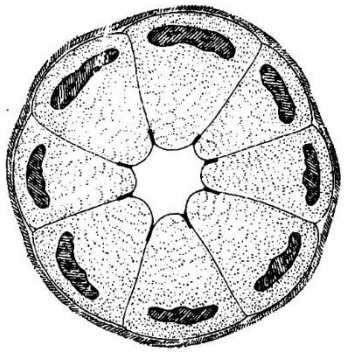


Mucous Acini



Mixed acini showing serous demilune

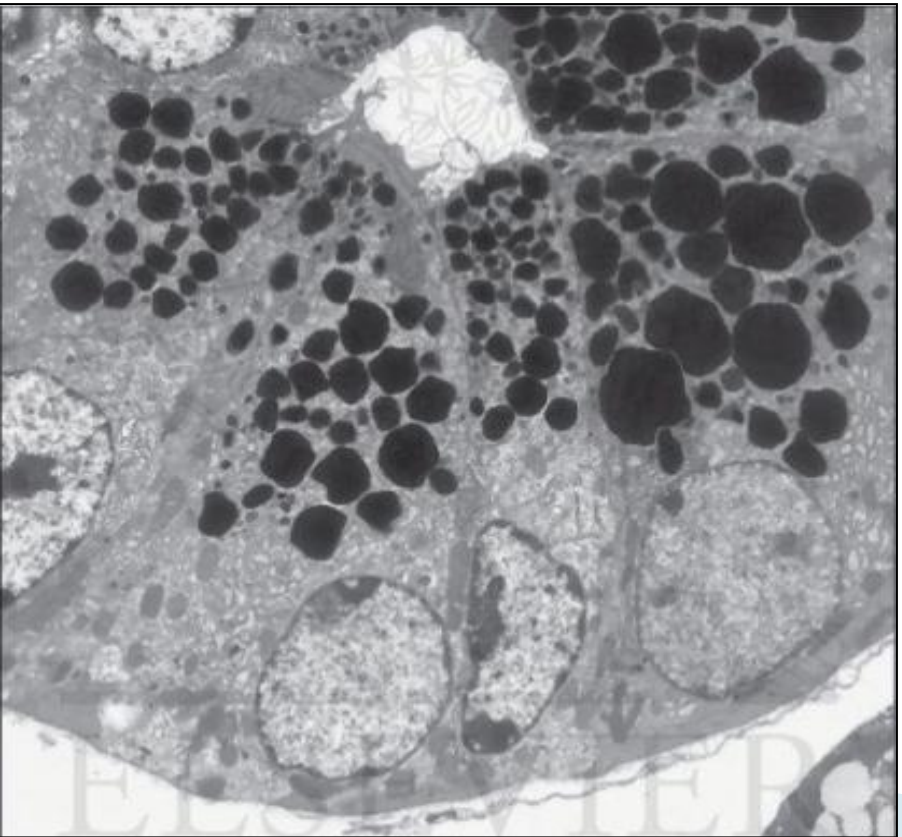


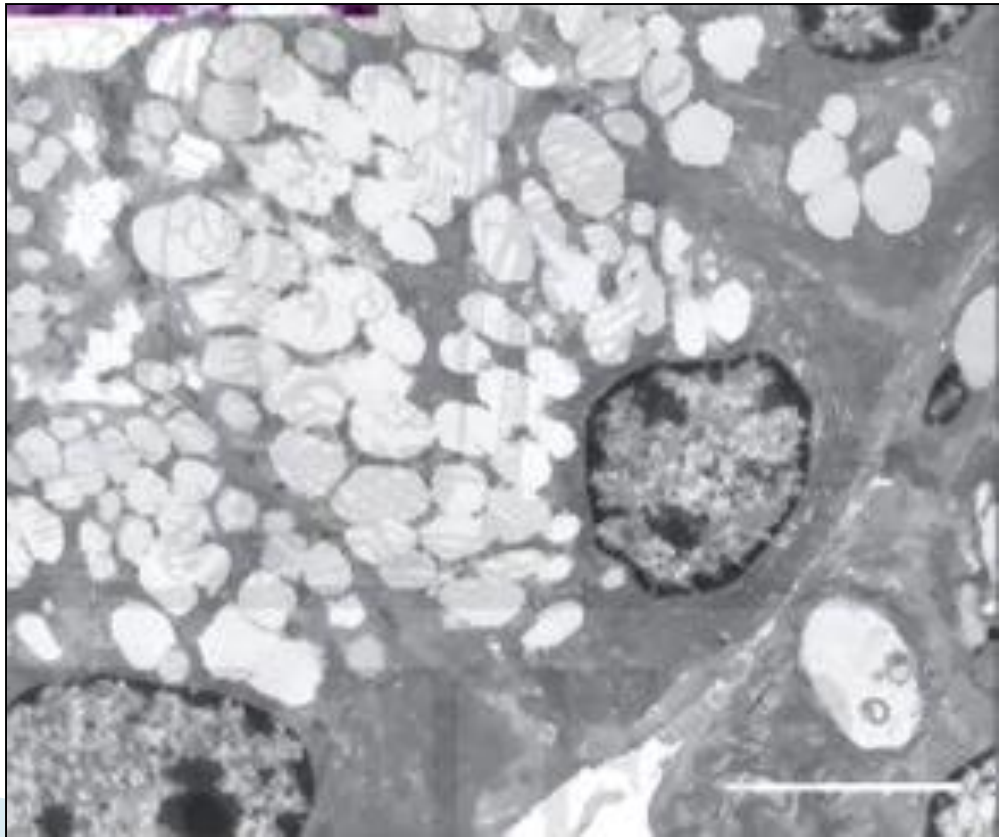


E.M. : Both are “Protein-Secreting Cells”. However,

Apical membrane-bound Electron-dense Secretory granules.

Membrane-bound Electro-lucent Mucinogen granules.

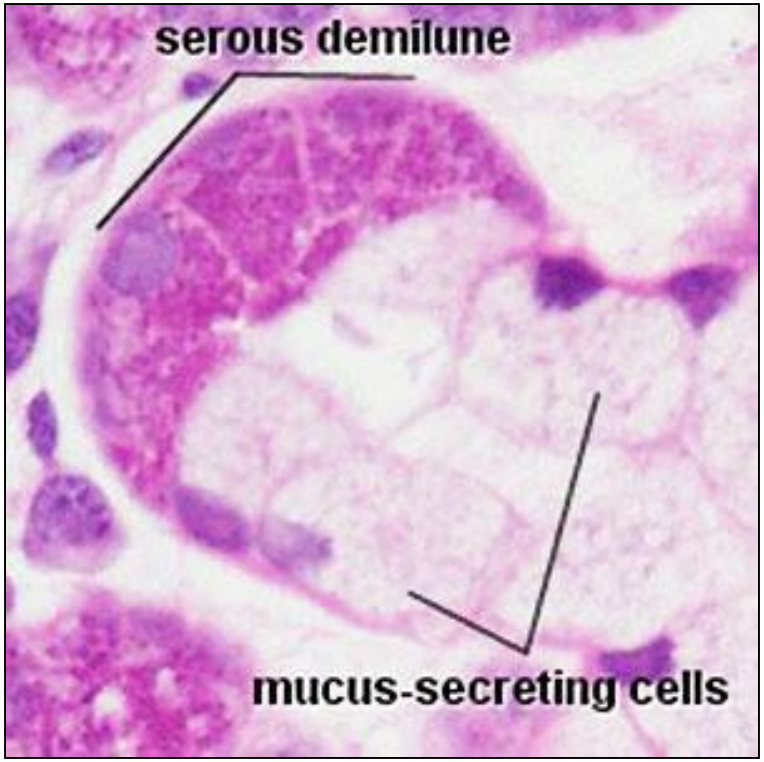




Mixed Acinus

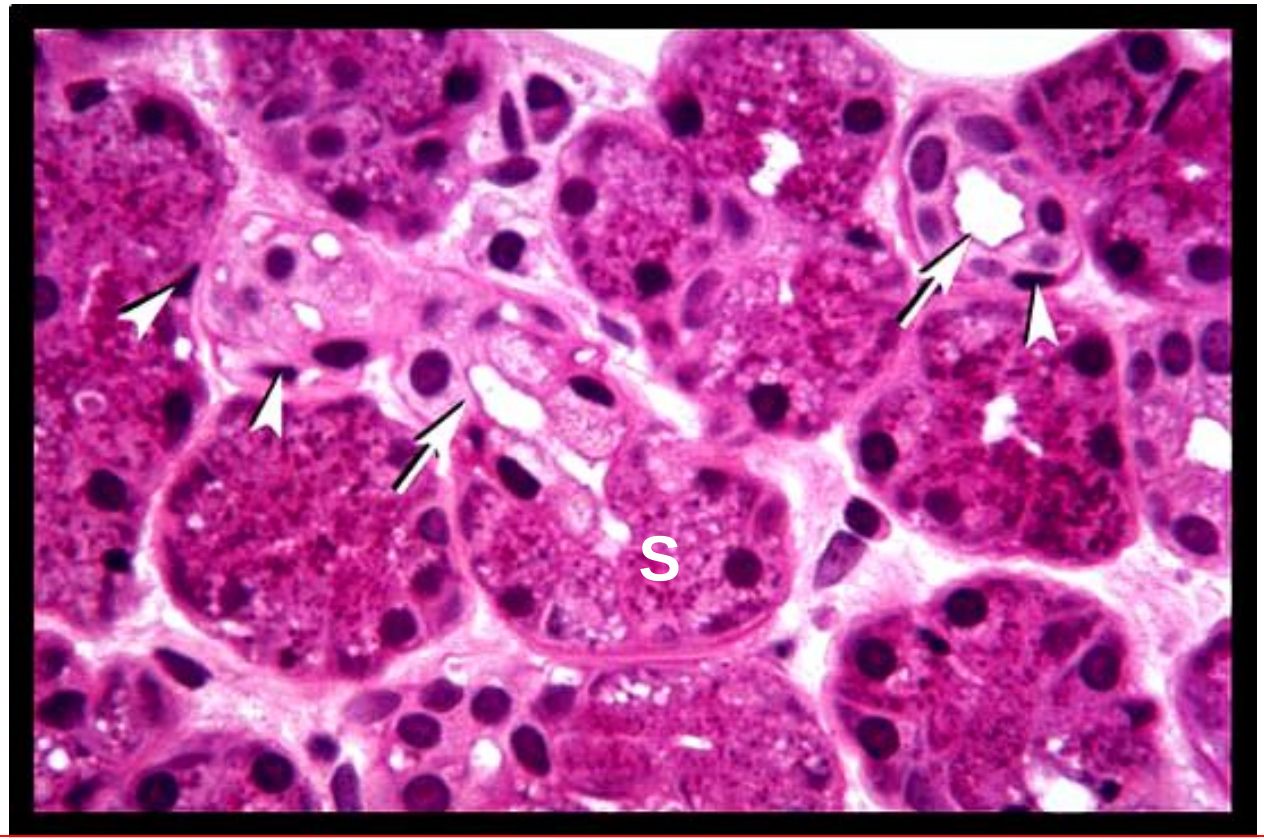
Mixed Acinus

Mucous acinus (M) capped by Serous Demilune (S) / Crescent of Giannuzi [formed of serous cells]



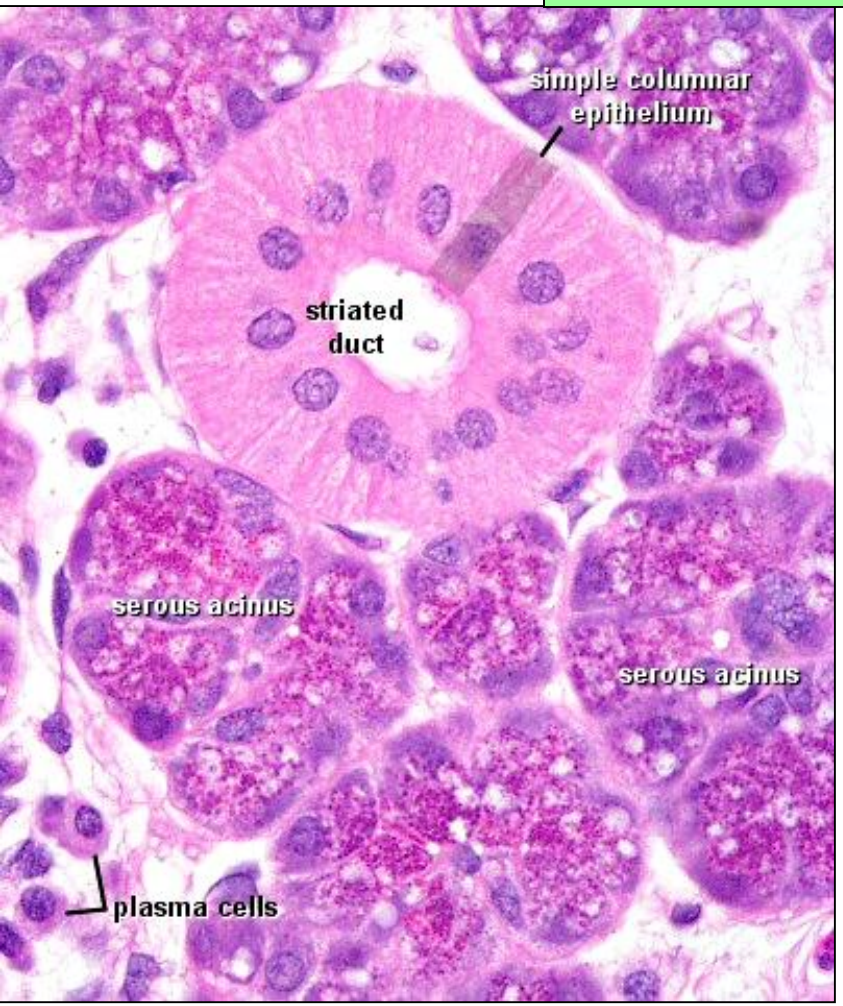
E.M. Picture of a Mixed acinus.

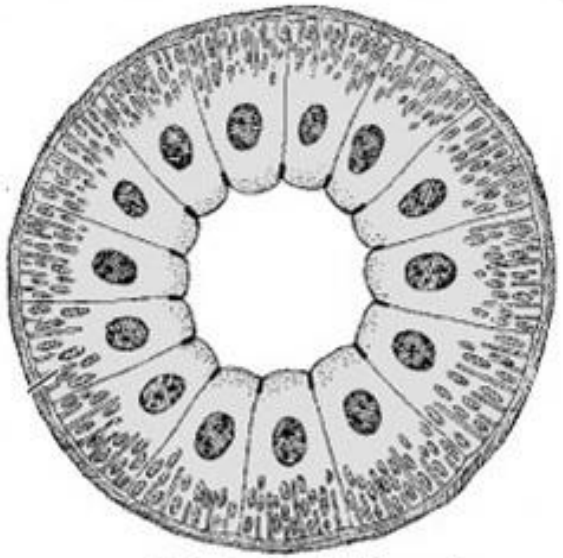
Intercalated Duct_(arrows)



It extends from a secretory acinus (S)
Acini empty their secretions into these ducts,
Lined with *Simple cubical epithelium*.
Have acidophilic cytoplasm.
Surrounded by myoepithelial cells (arrowheads)

Striated Ducts





Striated Duct

L.M.:

Lined by a single layer of cuboidal to low columnar cells.

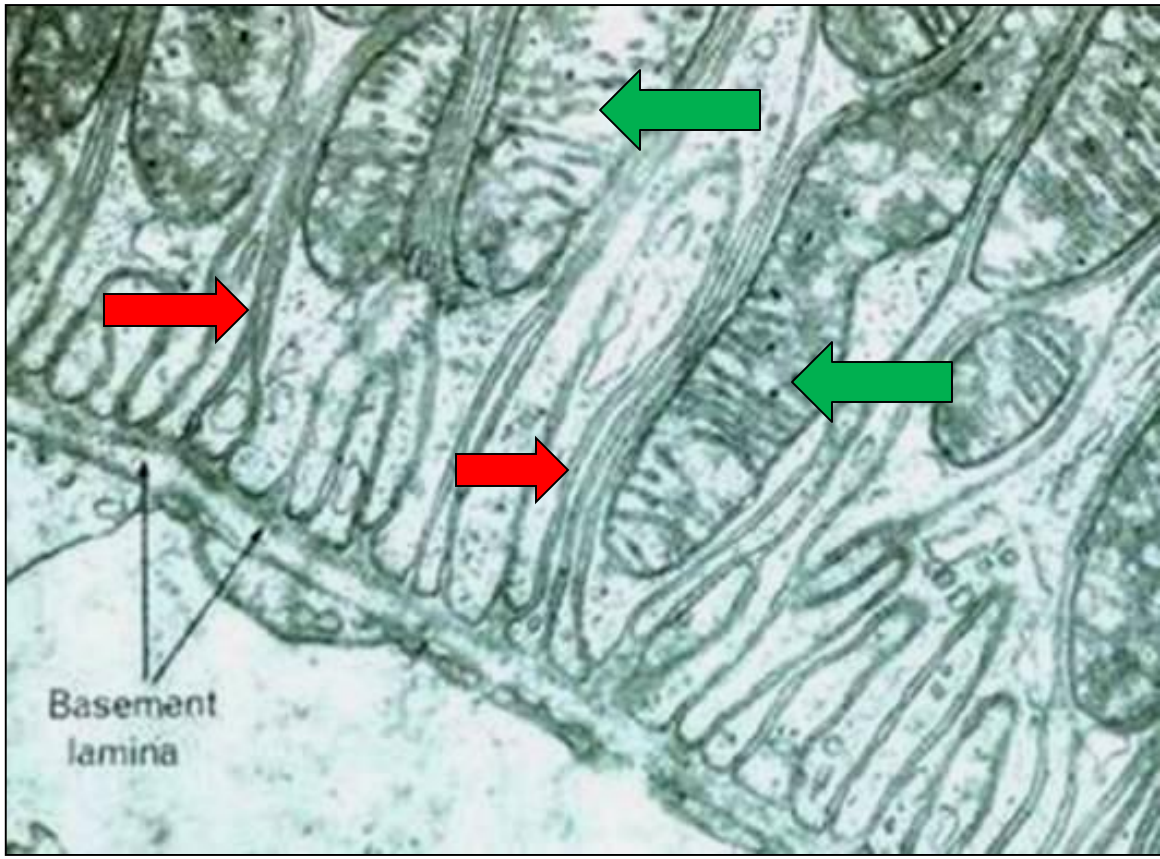
Cytoplasm: Acidophilic granular with basal striations ????

Nucleus: Central rounded nuclei.

Note that the striated duct is larger than the serous acinus / has acidophilic cytoplasm with vertical striations.

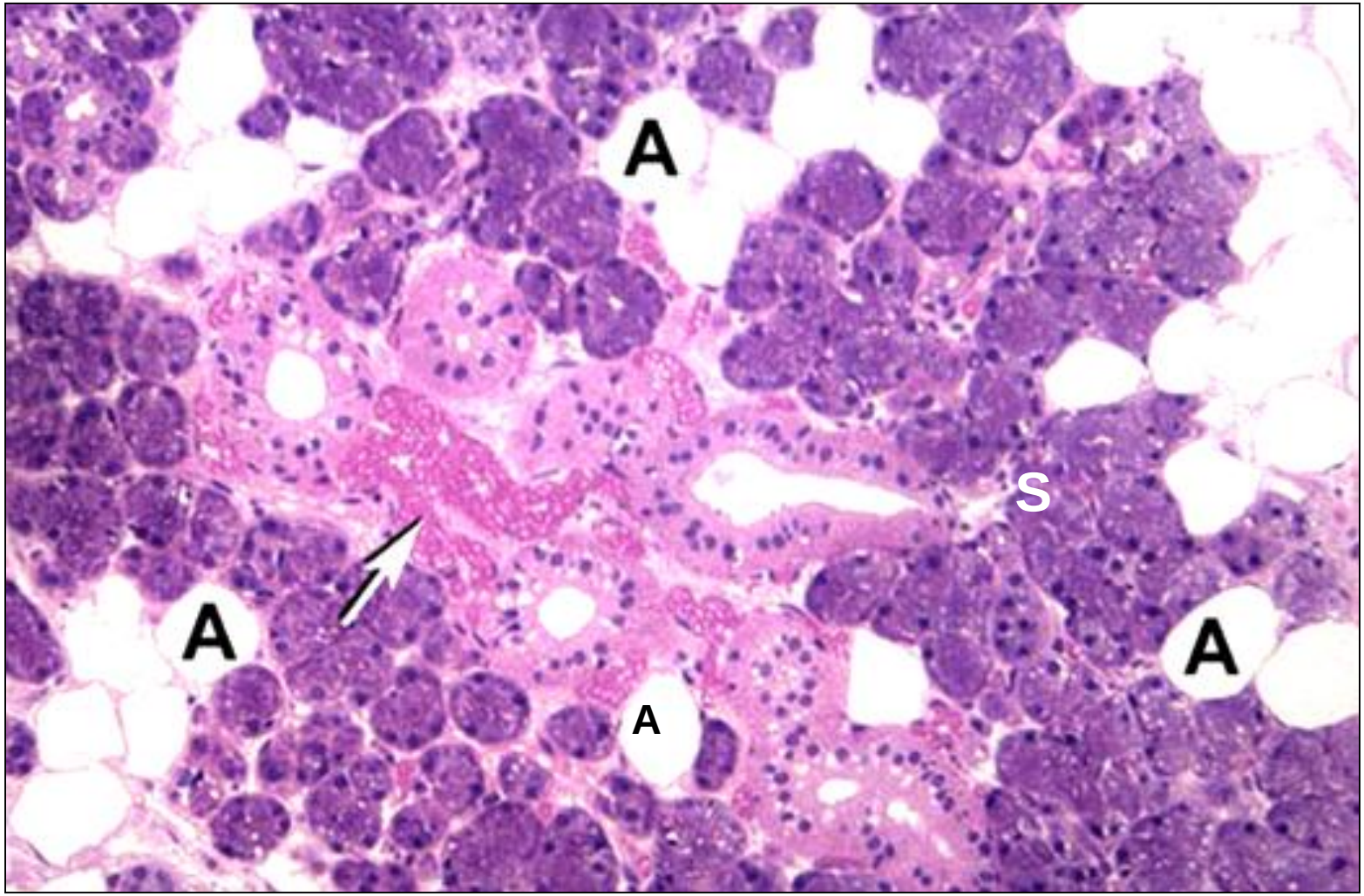
E.M.:

Basal striation is due to **basal infolding** of the cell membrane **(red arrows),** interdigitating with **elongated mitochondria (green arrows)**

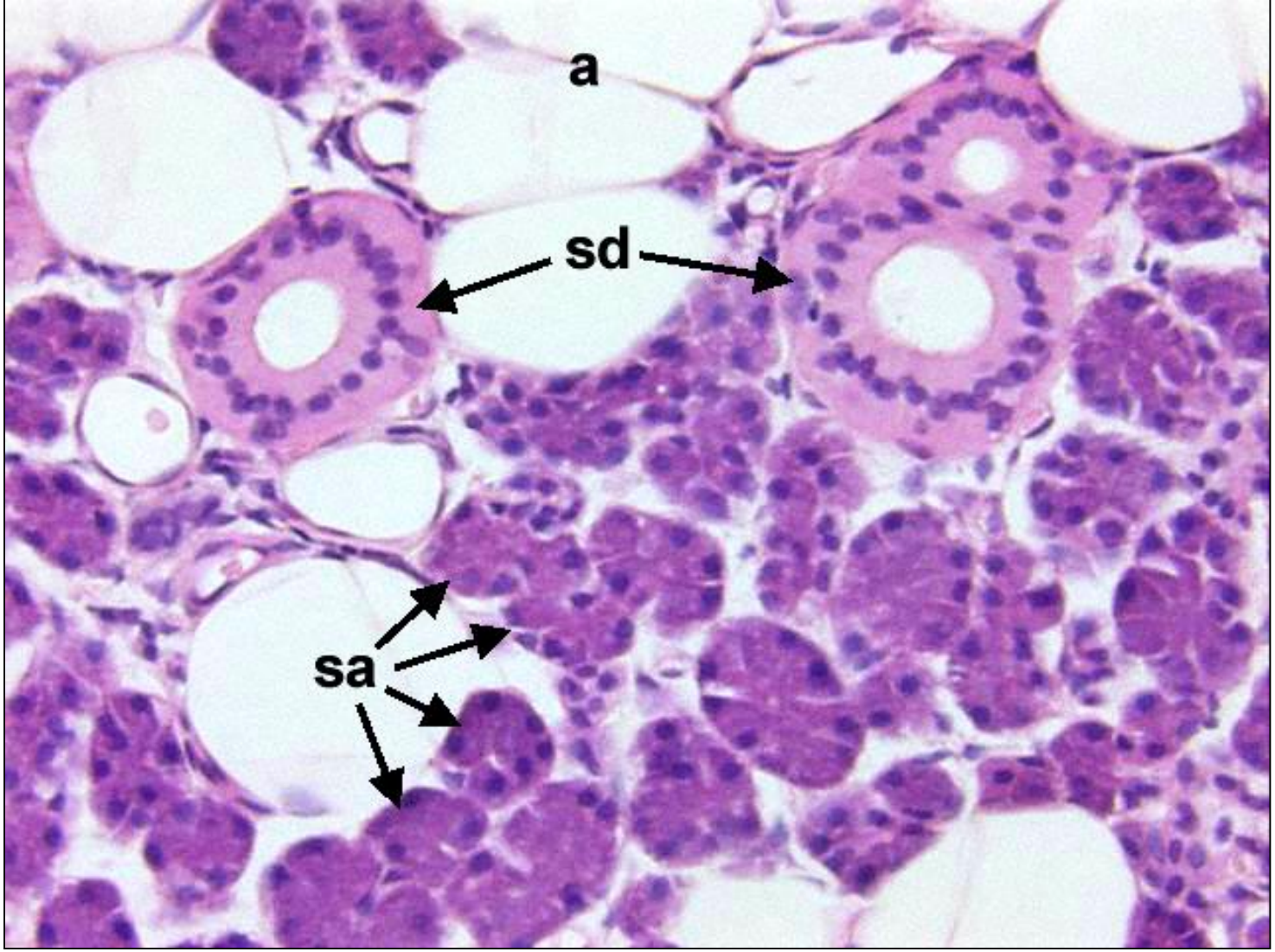


Characteristics of ion-transporting cells.

Parotid Gland [the largest]



Stroma is well developed: Thick capsule.
Trabeculae (Septa) are thick & rich in adipocytes (A).
Parenchyma: Purely serous acini (S).

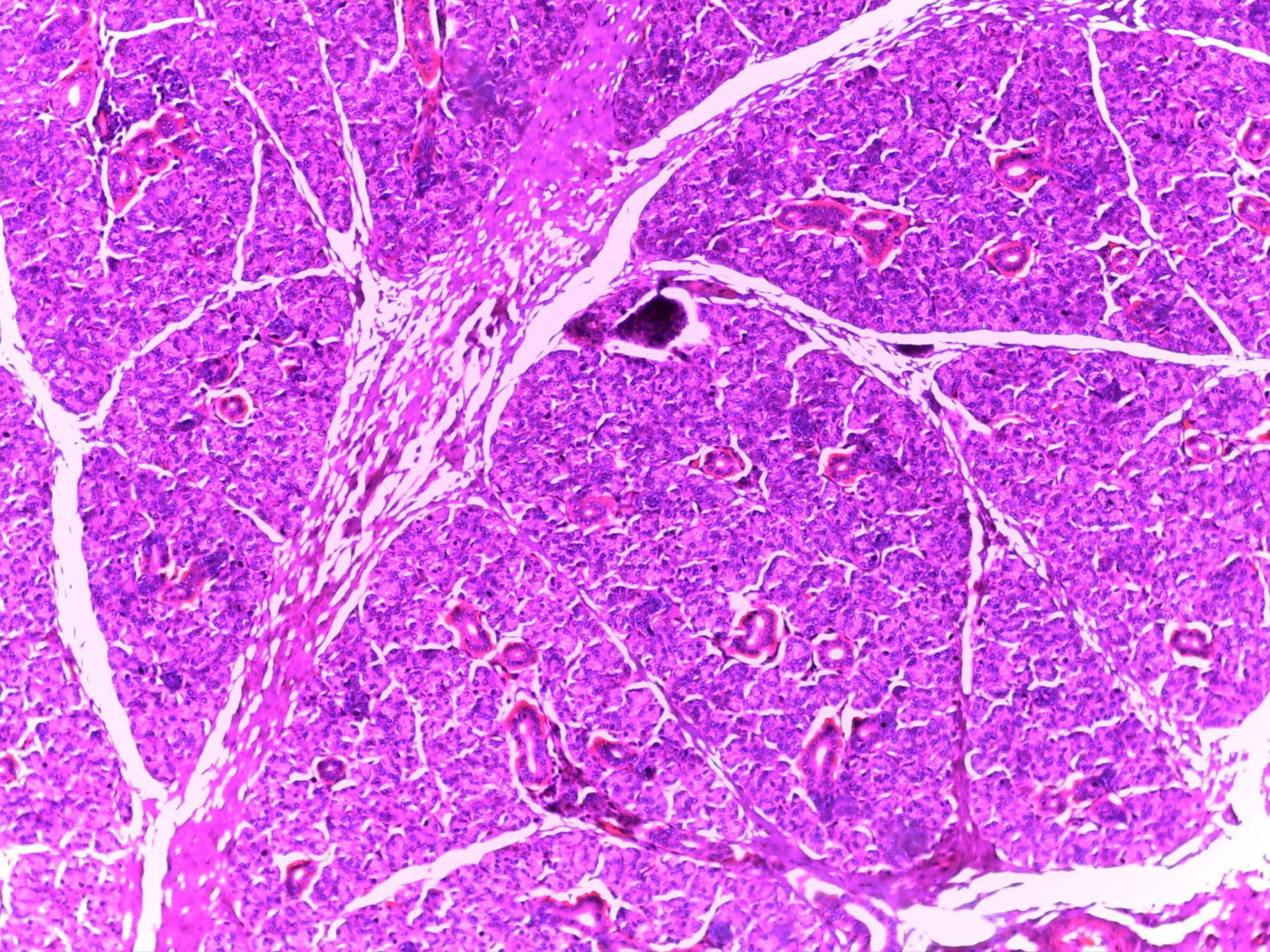


Histological features characteristic for section in the parotid gland include:

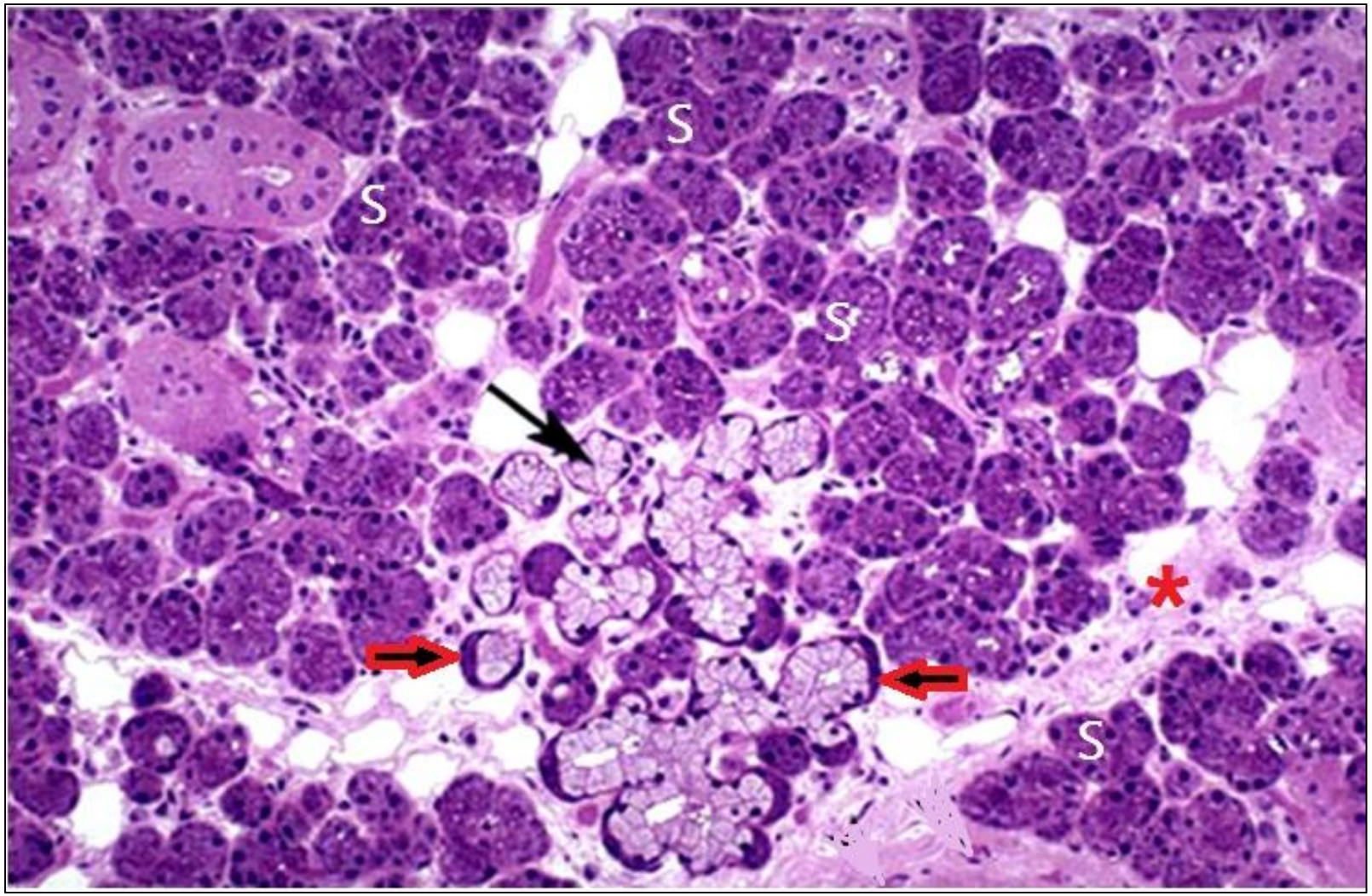
1- All the acini in the field are ---------serous acini- (sa) --------

2- Many ------striated ducts (sd): --. They are located--intralobular-------.

3- Many adipocytes (a).

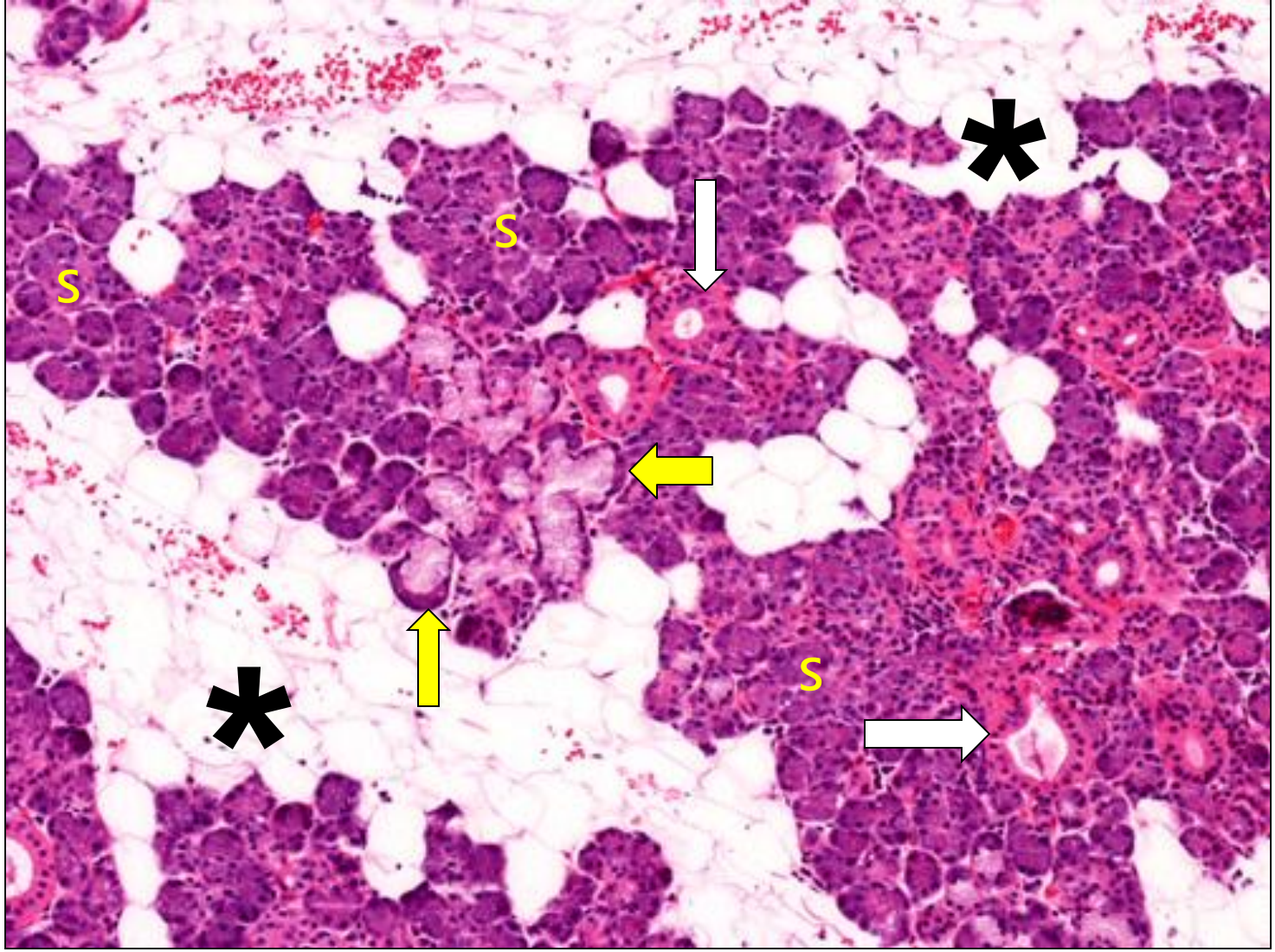


Submandibular Gland



Seromucous Gland

In humans, 90% of its acini are serous (S) & 10% are mucous (black arrow) and mixed (red arrows). Star: Thick septa rich in fat cells.



Histological features characteristic for section in the submandibular gland include:

-Acini in the field are mostly ------serous acini- (S) ---- with the presence of some- mixed acini----(yellow arrows). – Many intralobular ducts (white arrows)

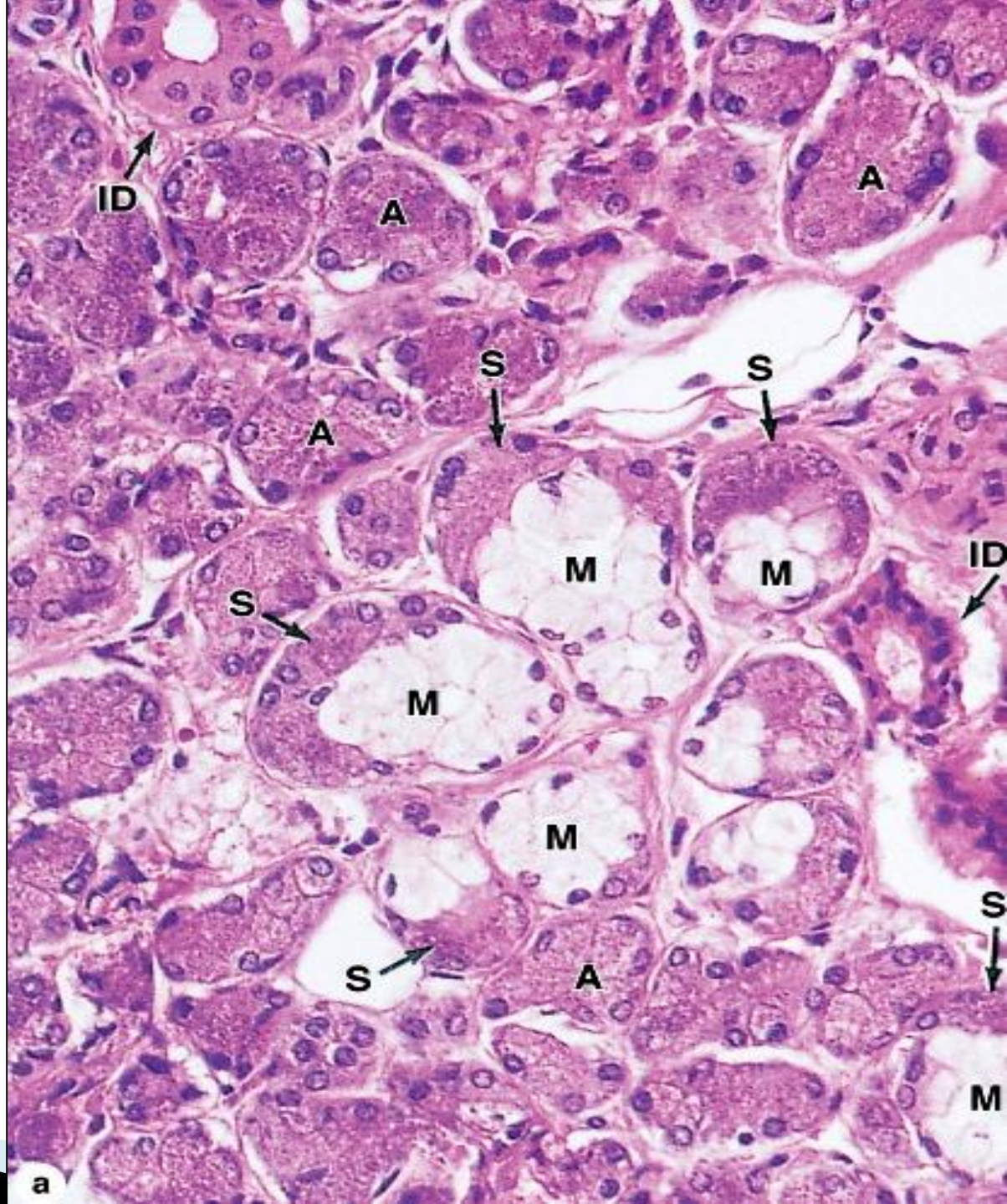
- Thick C.T, septa rich in fat cells (stars)

Serous acini (A) predominate in Submandibular gland.

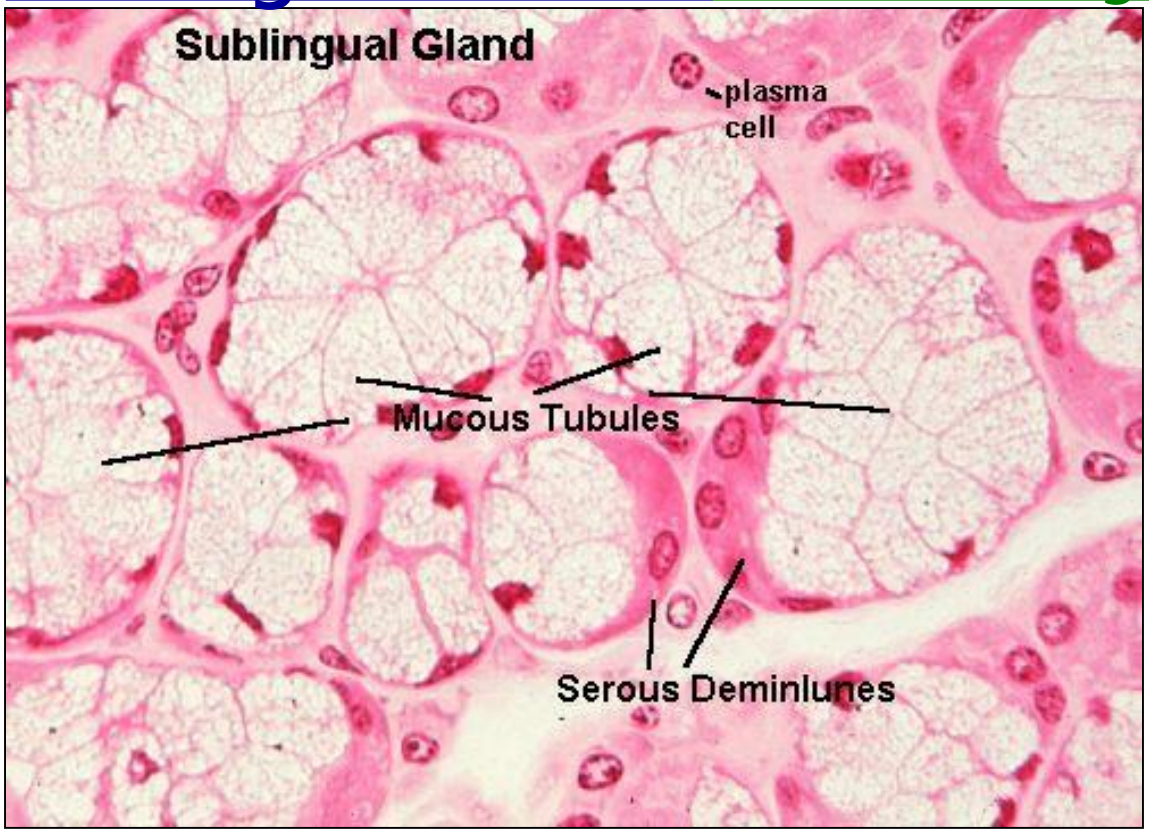
Serous cap in **serous demilunes (S).**

Pale-staining mucous cells (M).

Intralobular ducts (ID).



Sublingual Gland (the smallest gland)



Mucoserous gland

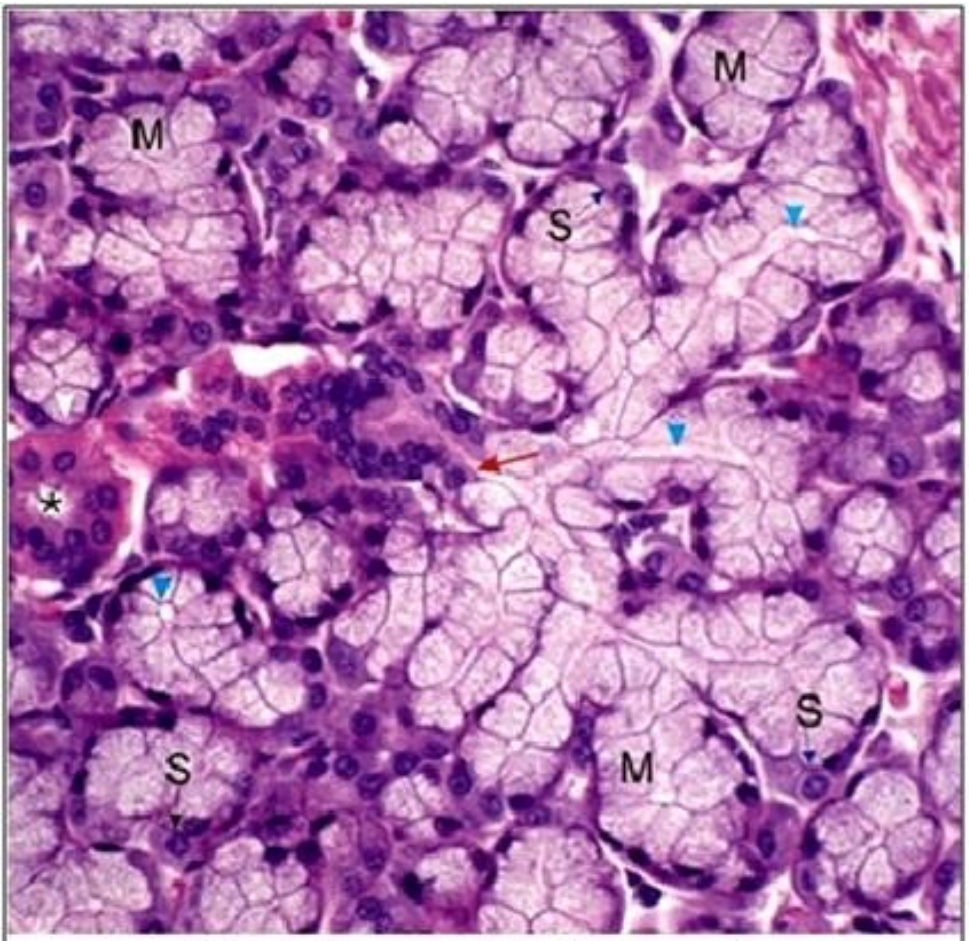
Mucous acini predominate.

Some mixed acini.

NO purely serous acini.

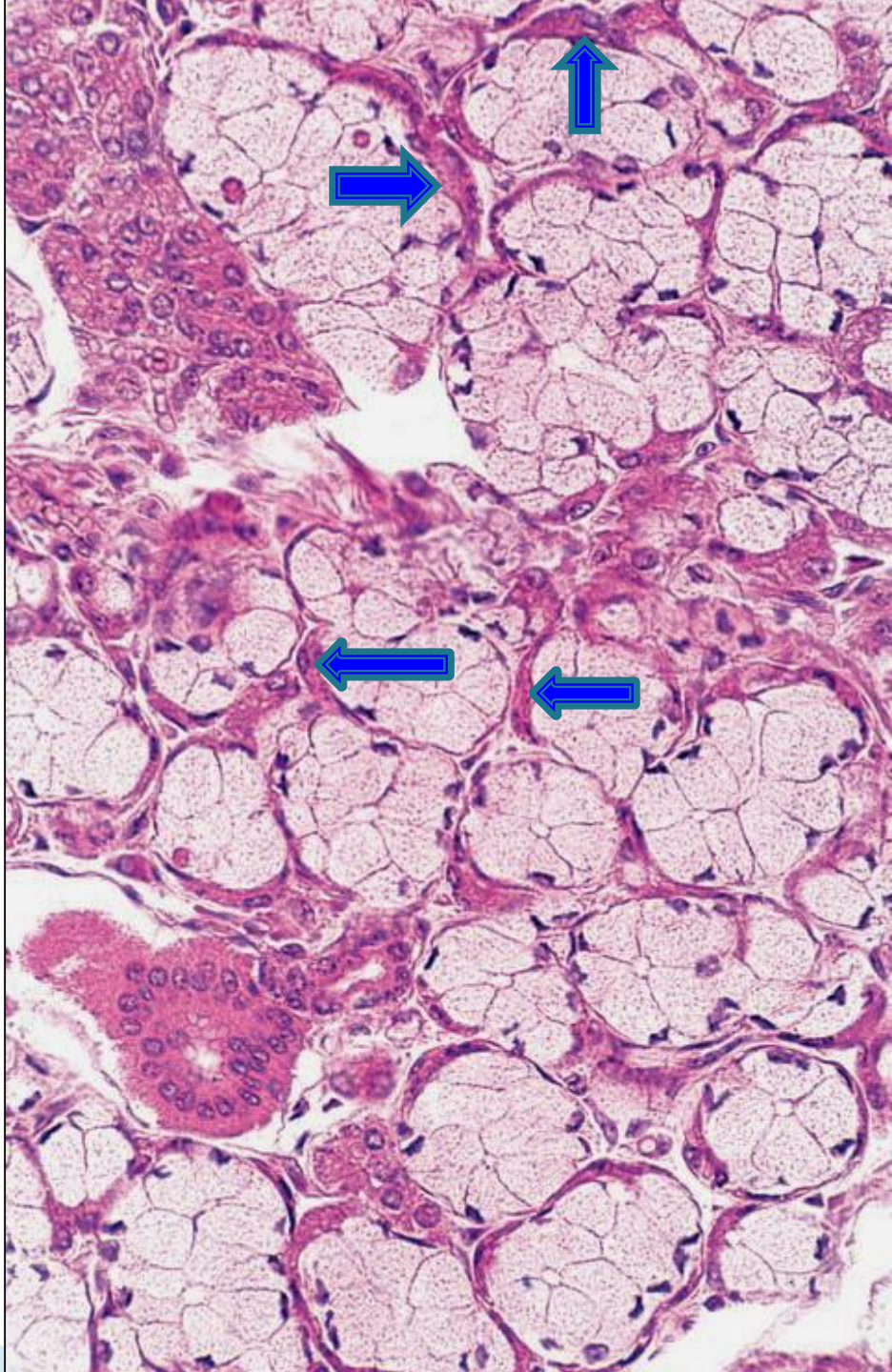
Few, less-developed intercalated and striated ducts.

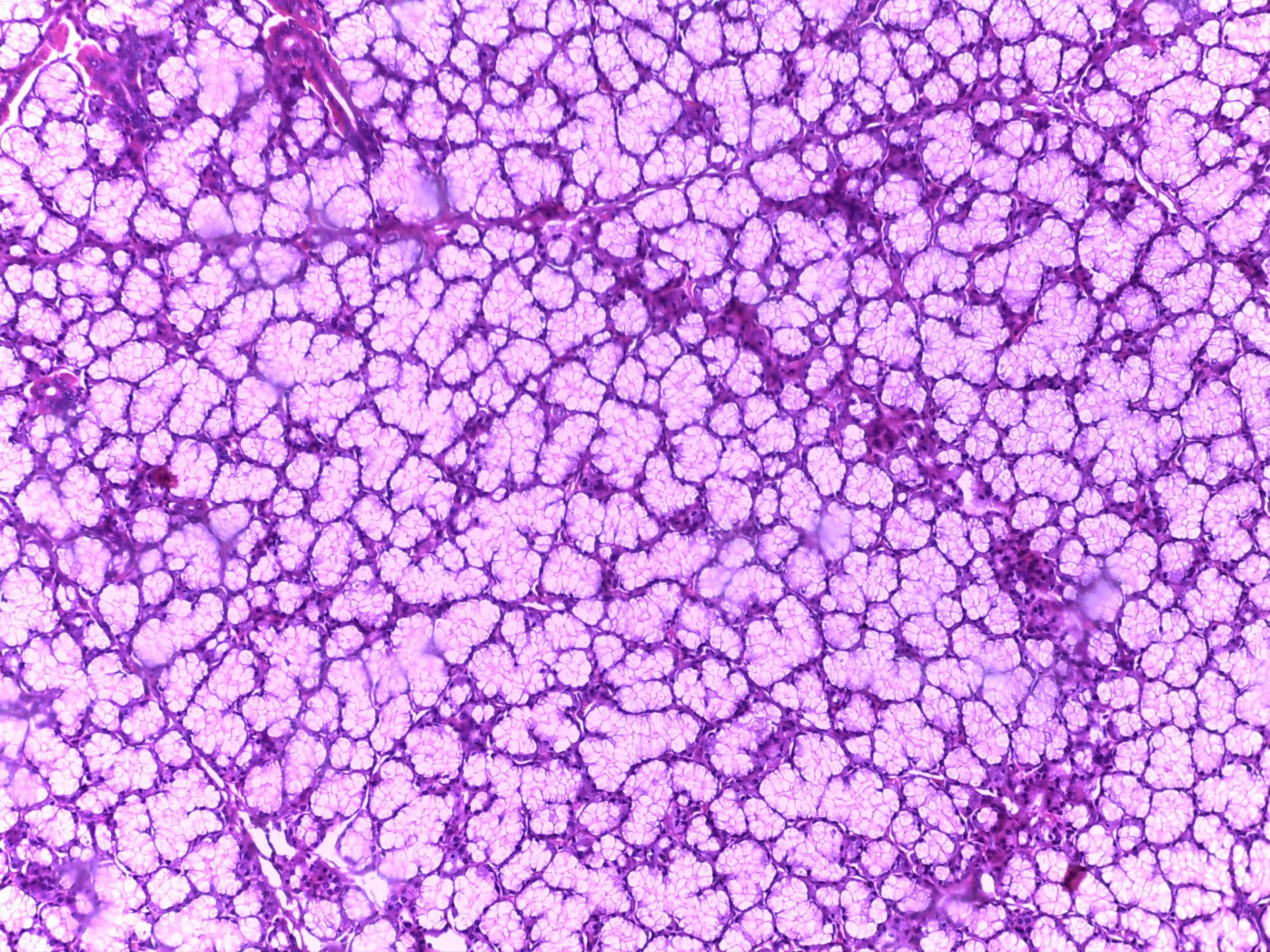
Sublingual Gland

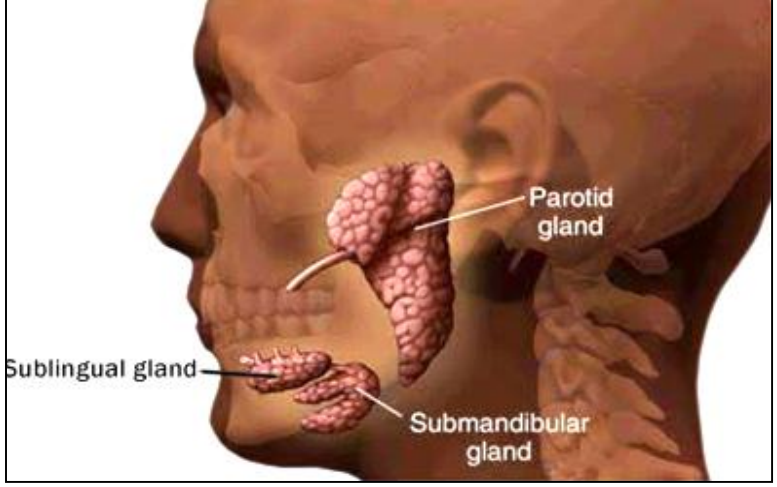


Sublingual Gland

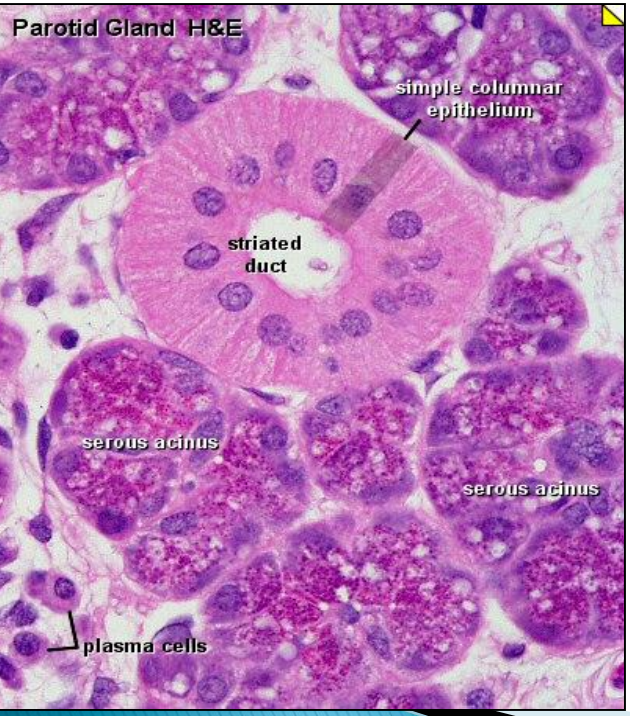
M: Mucous acini S: Serousdemilune
Red arrow: Intercalated duct
Star: Intralobular (Striated) duct



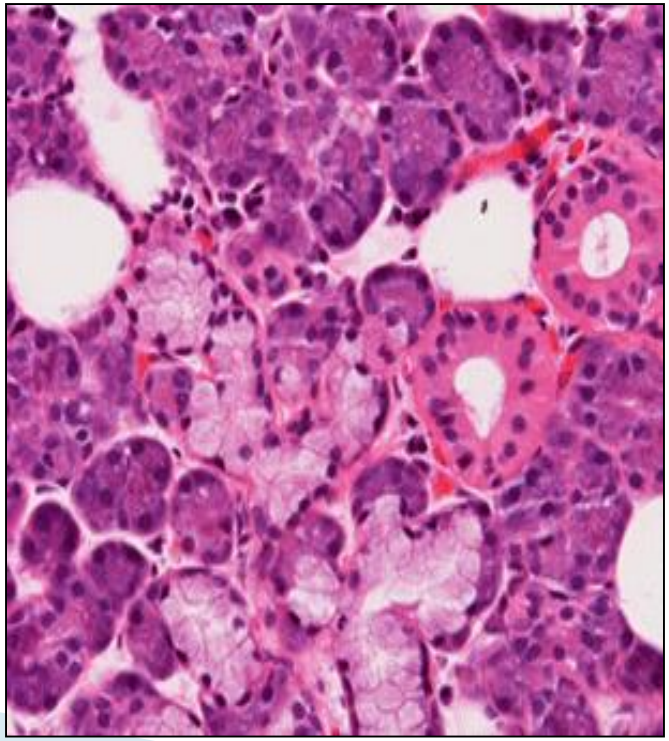




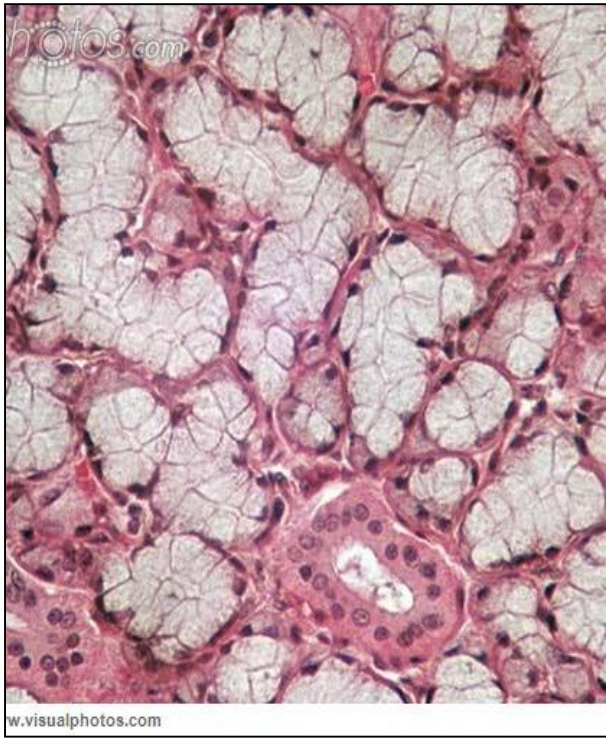
Parotid



Submandibular



Sublingual



- Oesophagus

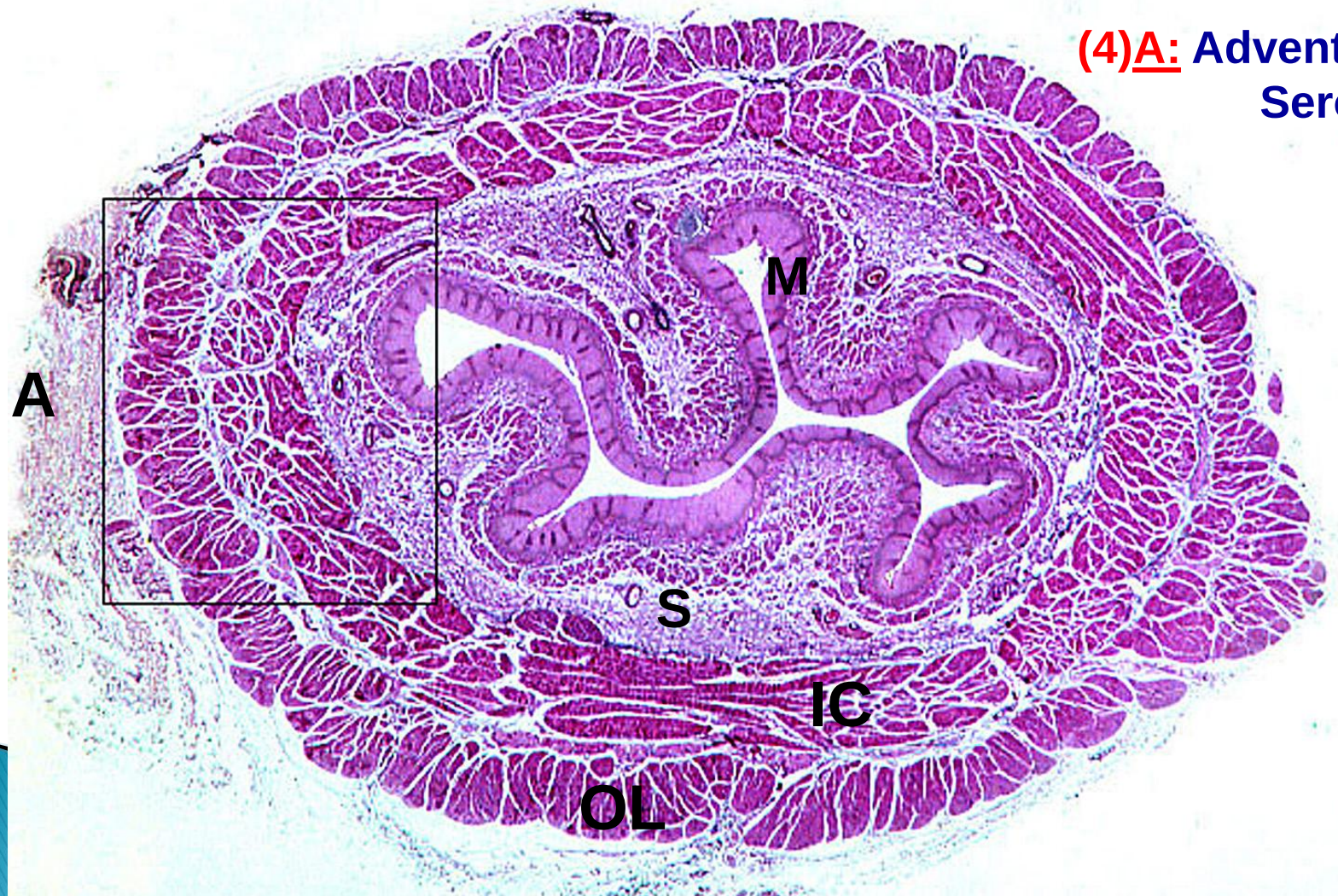
General Plan of GIT

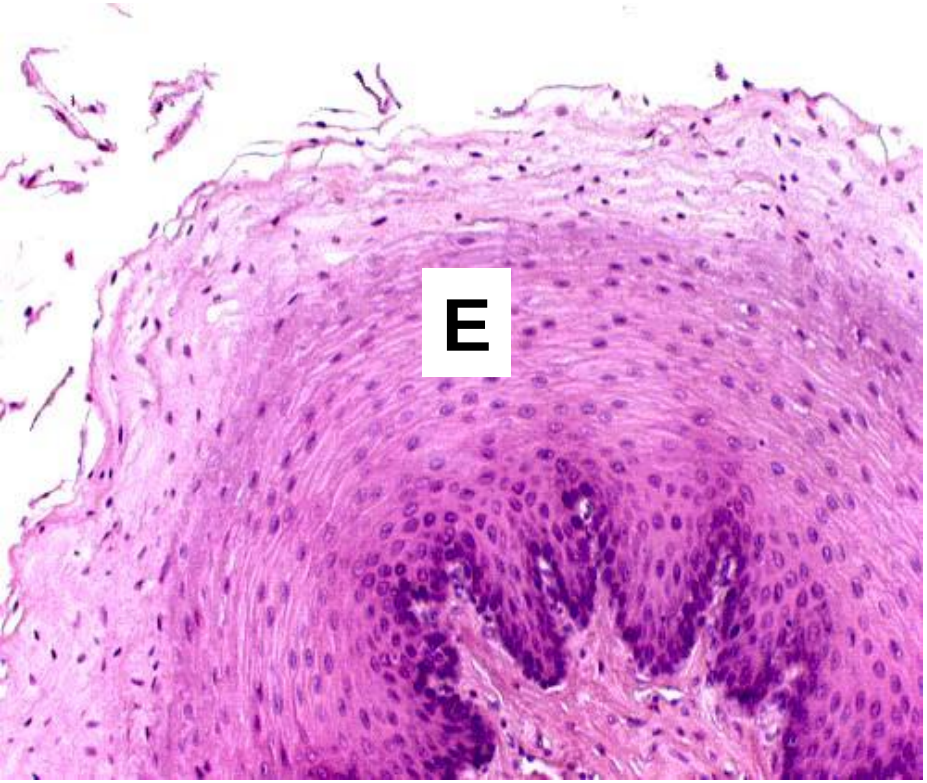
(1)M: Mucosa:
- Epithelium
- Lamina Propria
- Muscularis Mucosa

(2) S: Submucosa

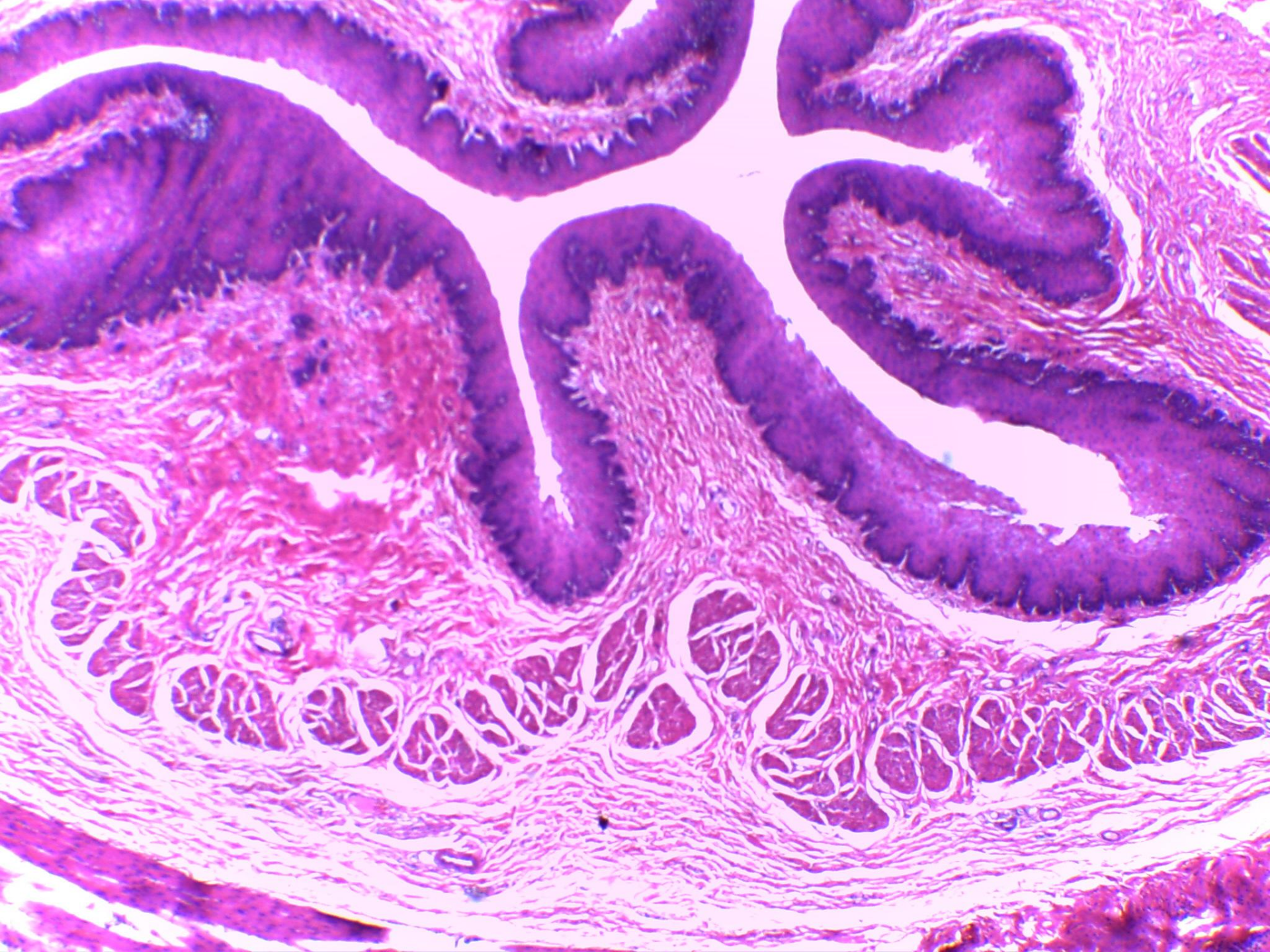
(3) MUSCULOSA
- IC: Inner circular
- OL: Outer longitudinal

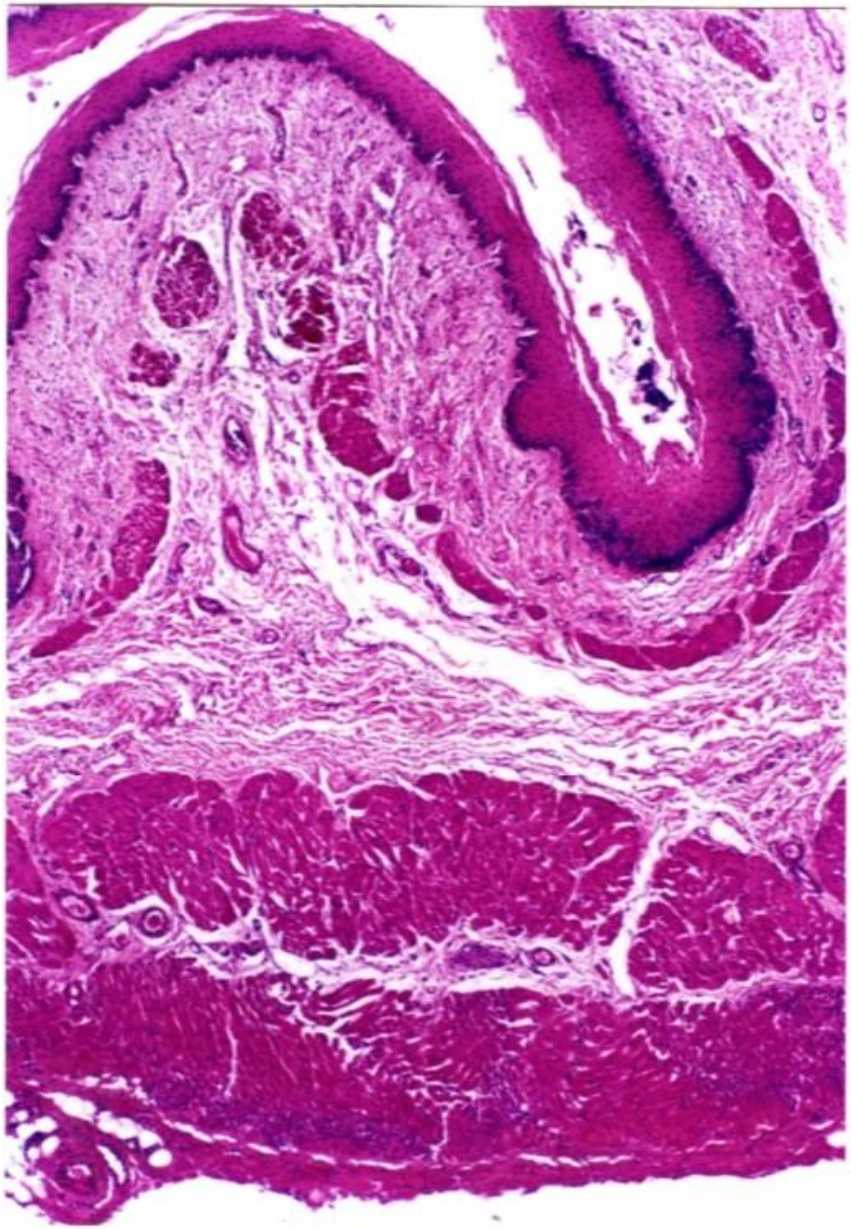
(4)A: Adventitia/ Serosa



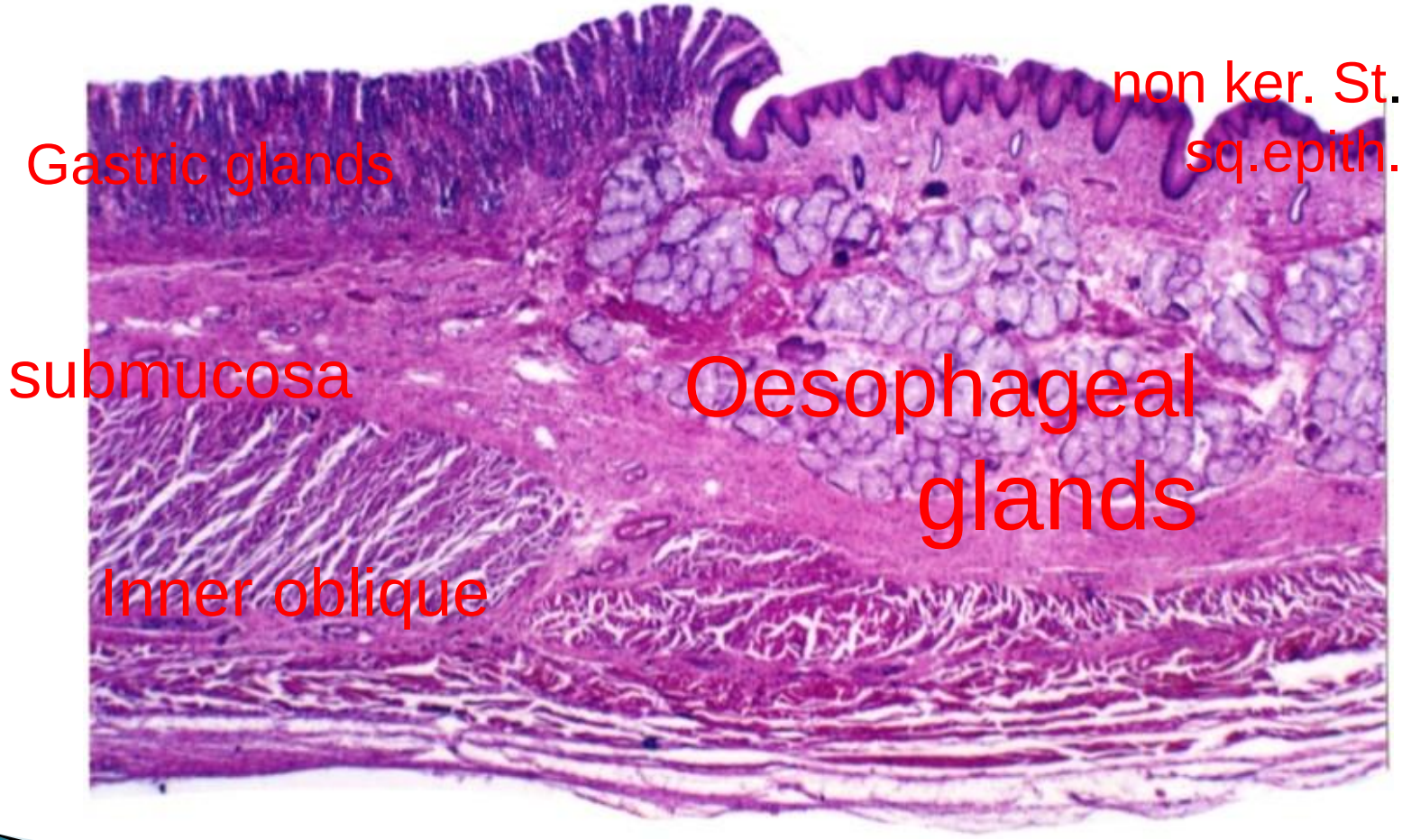


E: Non-Keratininzed Stratified Squamous Epithelium on a clear wavy BM.

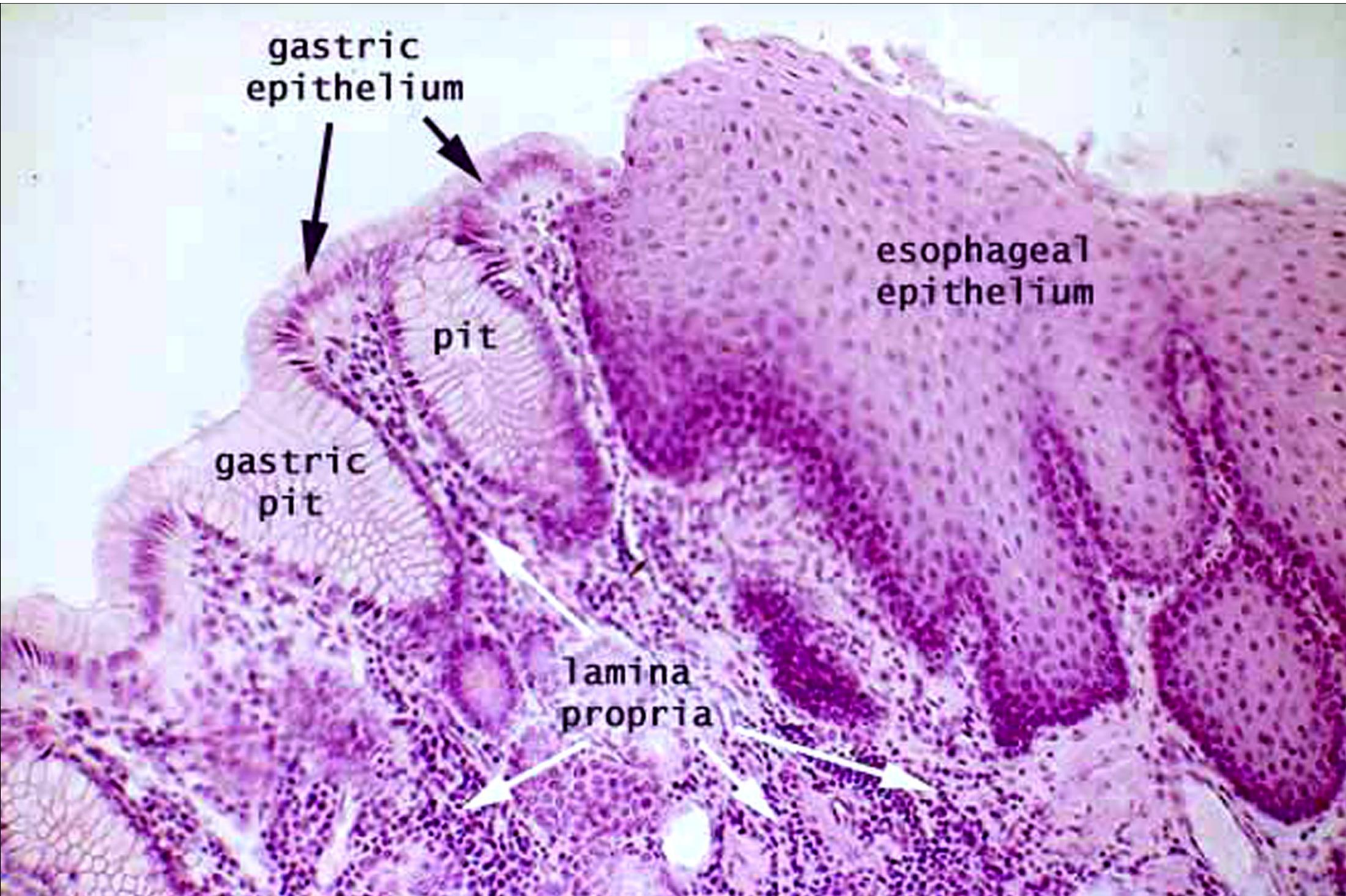


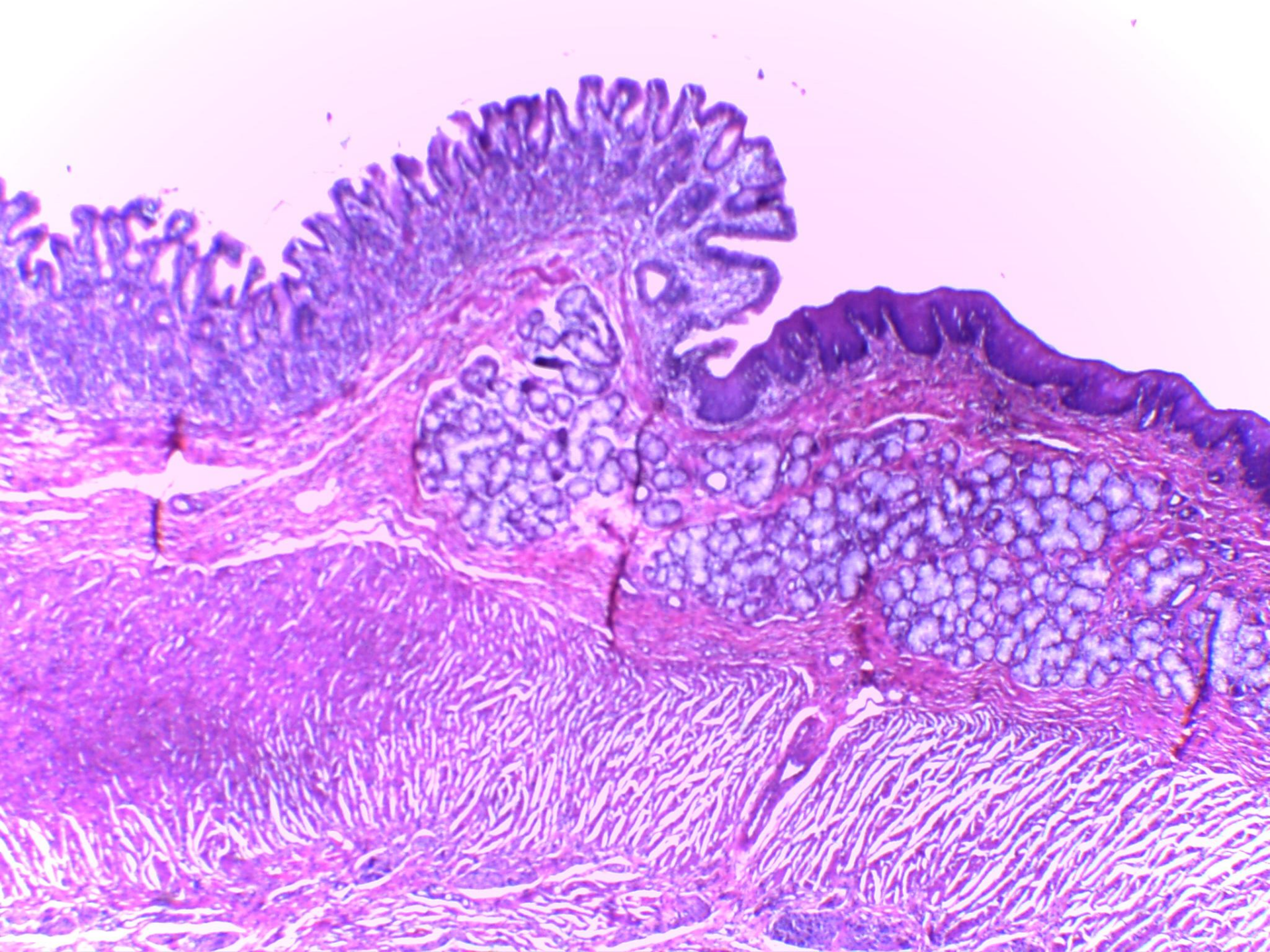


Gastro-oesophageal junction



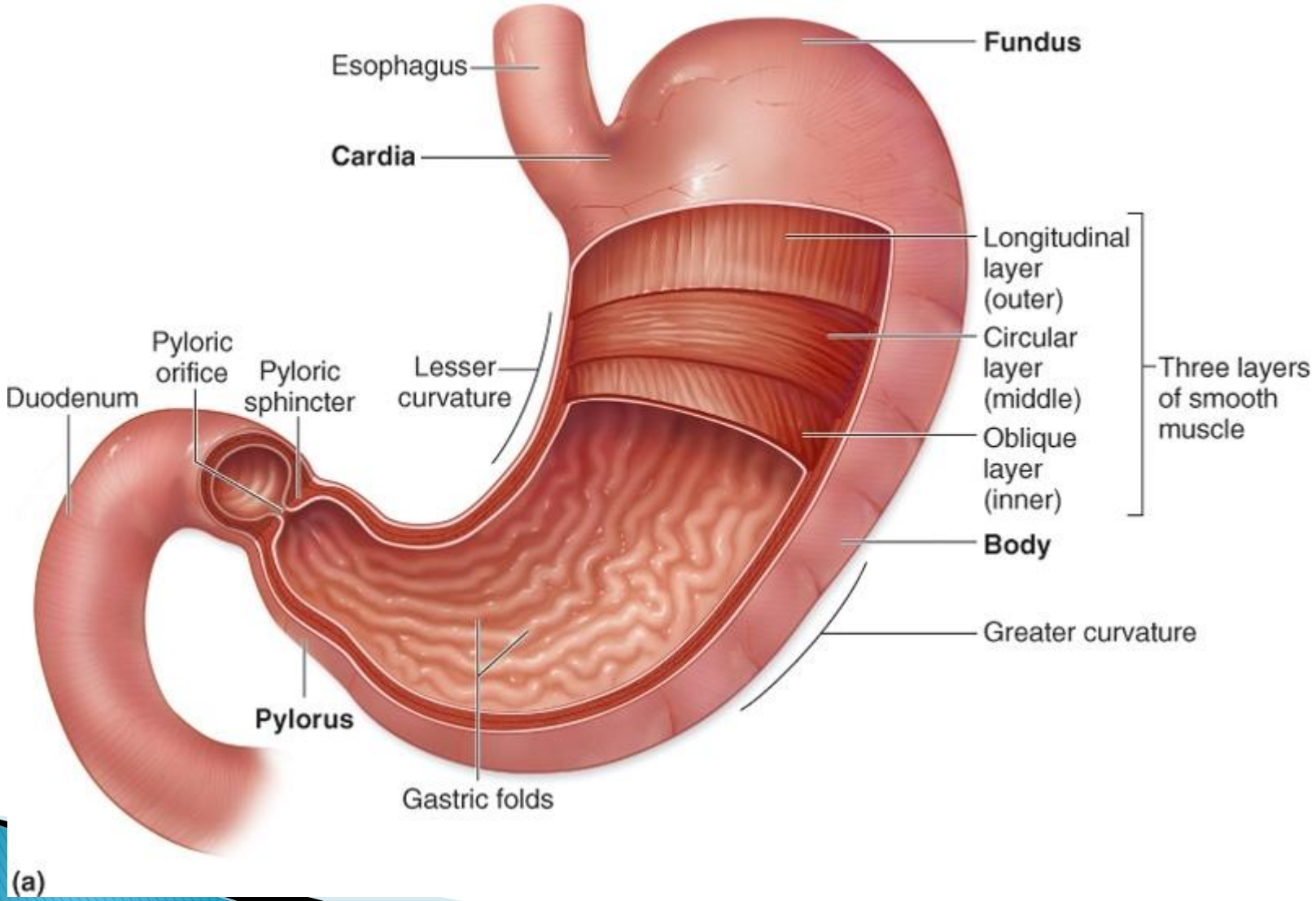
Gastro- Oesophageal Junction





Stomach

Anatomical Parts of Stomach

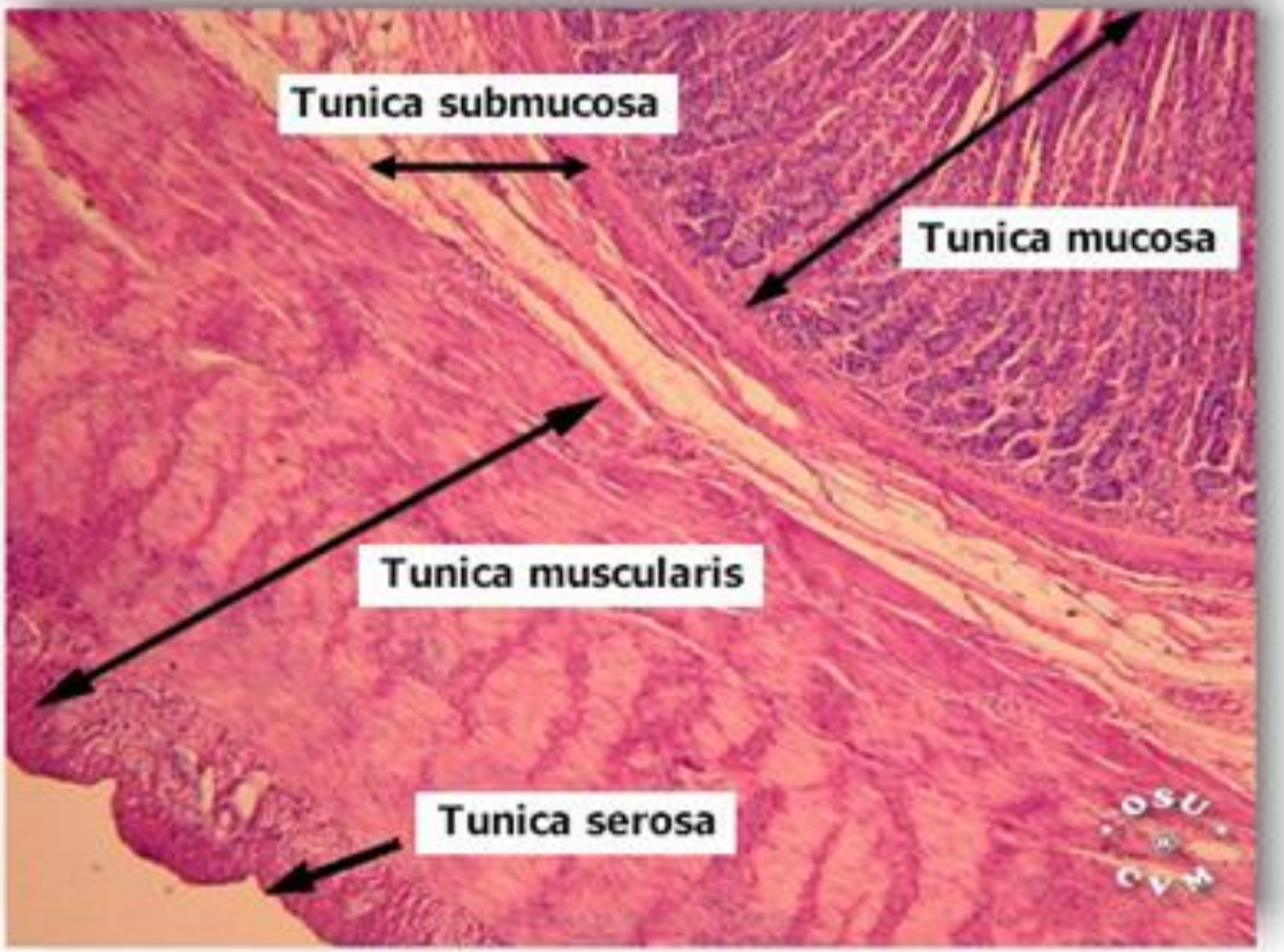


Fundus of Stomach

Gastric Rugae (GR)
Longitudinal branching
Folds in empty stomach.

4 Layers:

1) Mucosa (M)
2) Submucosa (SM)
3)Musculosa;
***Inner oblique (IO)**
***Middle Circular (MC)**
***Outer Longitudinal (OL)**
4) Serosa

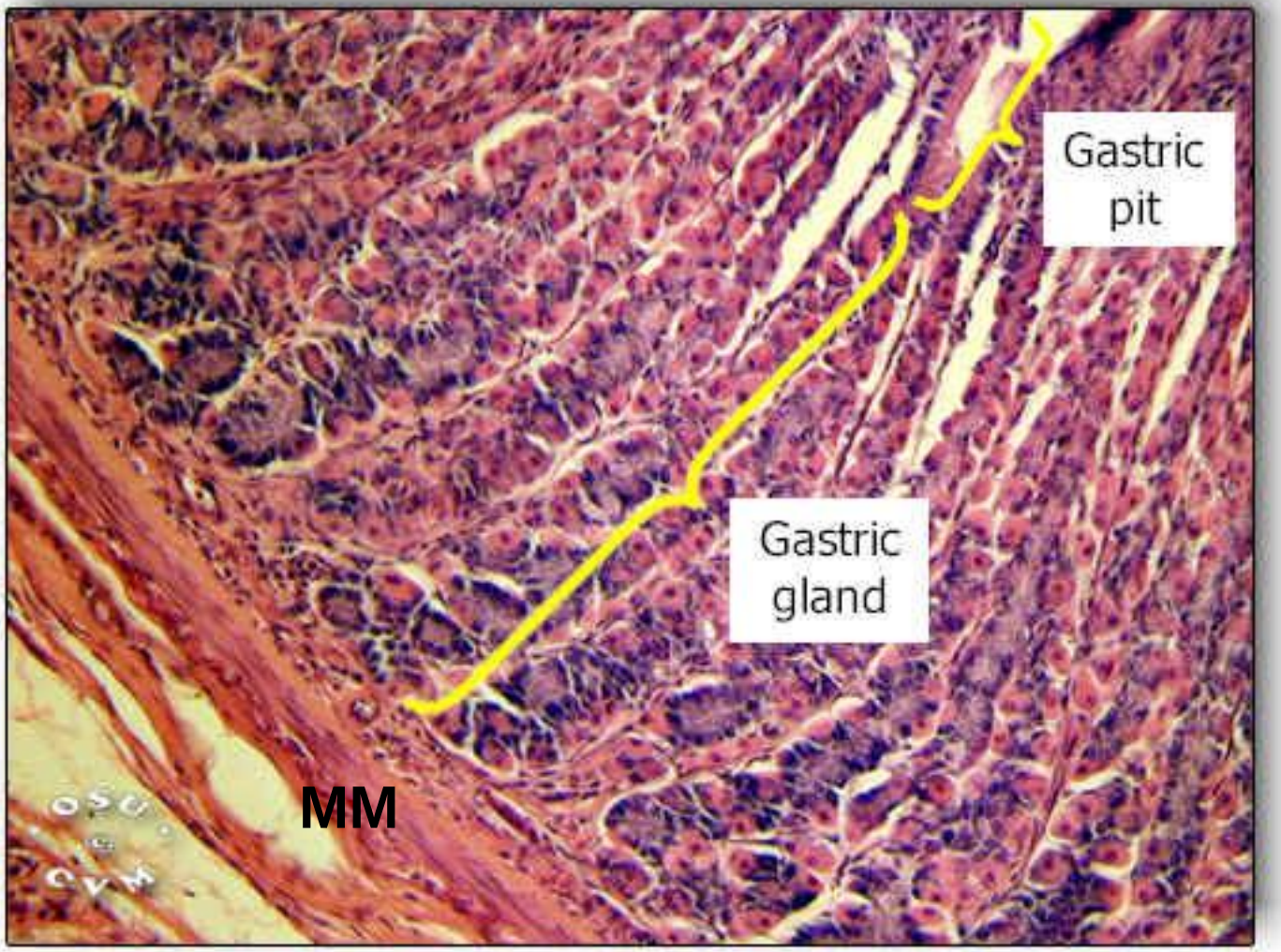


Wall of Fundus of the Stomach

Mucosa, Submucosa, Musculosa & Serosa

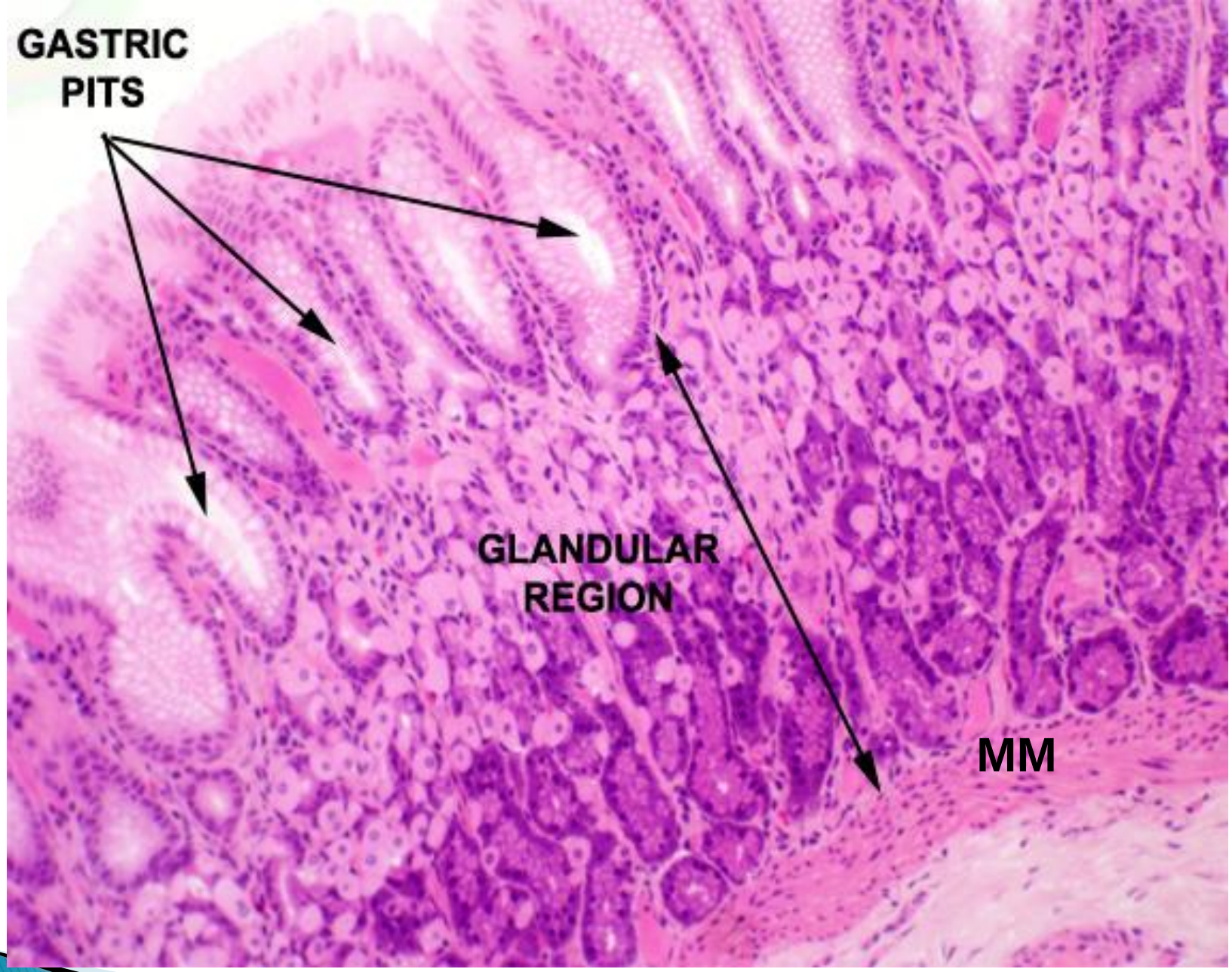
Fundic Glands:

* Occupy most of mucosal thickness.
* Perpendicular to the surface, reaching to muscularis mucosa (MM).



*Very Crowded Minimal C.T..

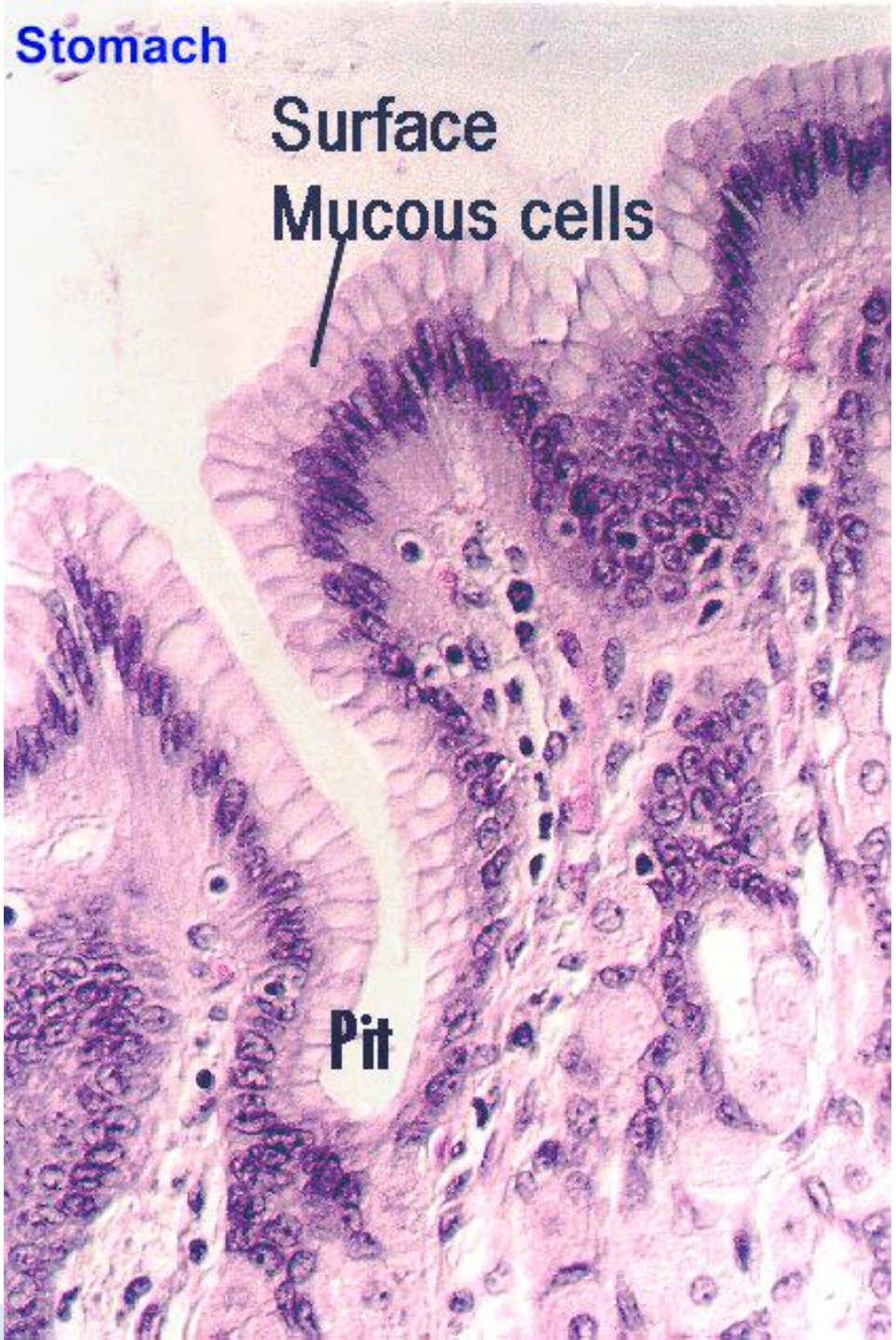
* **Simple Branched Tubular Glands.**
* **Open into lumen by short narrow *ducts* *(Gastric Pits)***
* **Pit: Secretory Portion: 1:3**

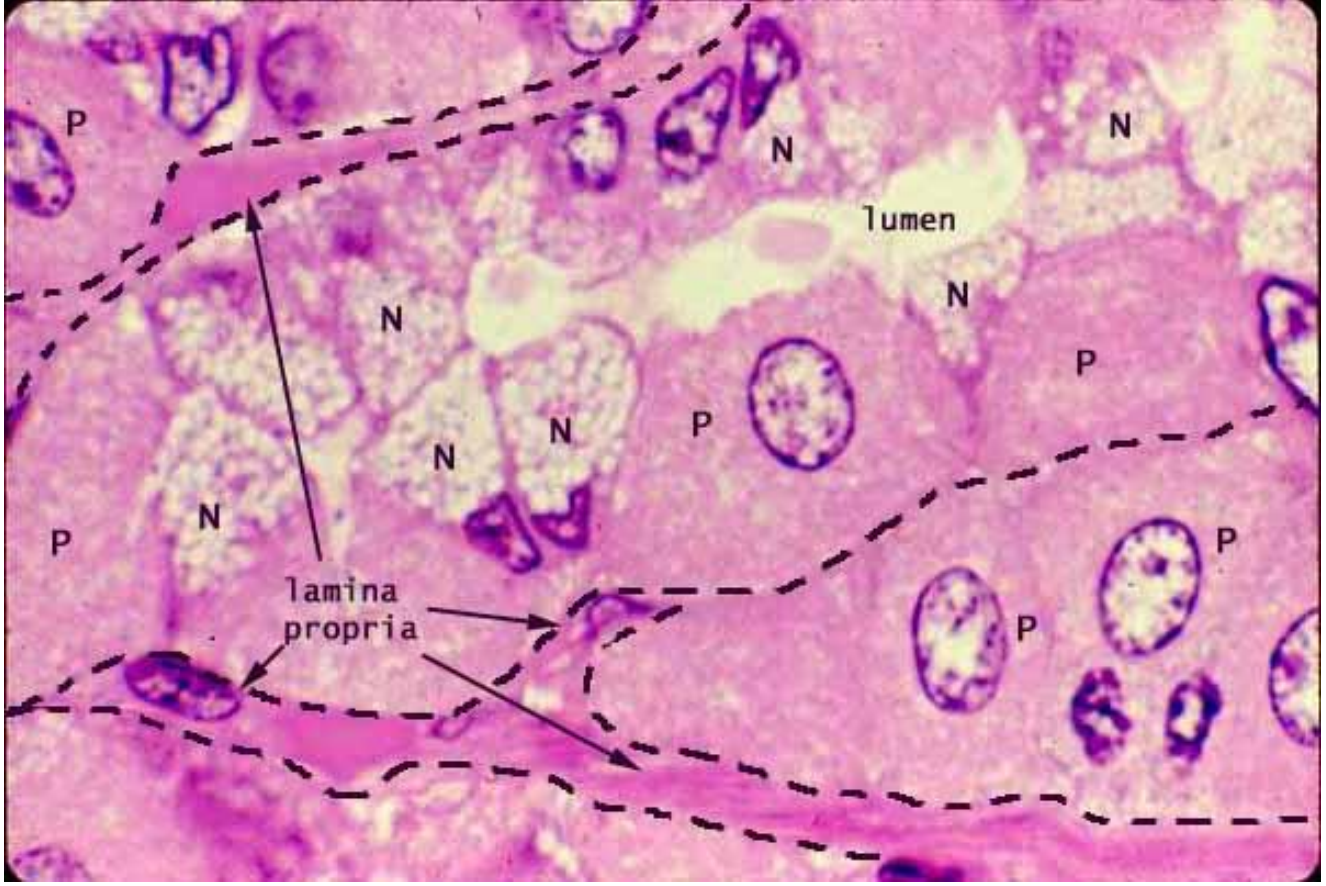


MM: Muscularis Mucosa

Fundic Stomach with a short pit

Surface mucus secreting epithelium



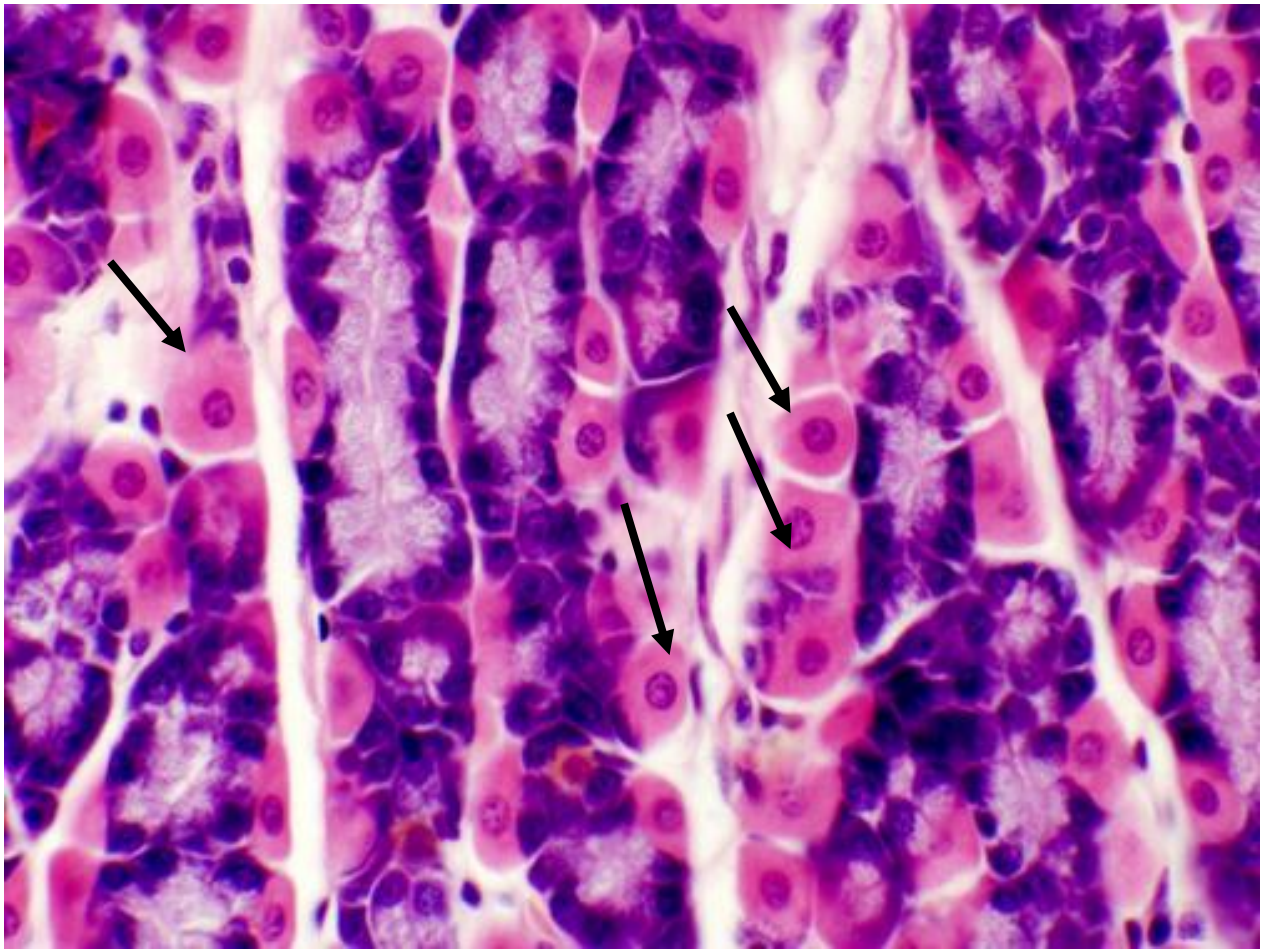


Mucous Neck Cells

* Located at the ***neck*** of the glands.
* Low Columnar Cells with Vacuolated foamy cytoplasm.
* **Function:** Secrete ***"Acidic Mucus"*** which protect gastric mucosa.

OXYNTIC (PARIETAL) Cells:

(Arrows)



Functions:

Secretion of:

1) **HCL.**
2) **Intrinsic Anti-pernicious anemia Factor**

- **Found mainly in the *upper parts* of the gland**
- ***Large*, rounded or triangular with central rounded nucleus.**
- **DO NOT reach lumen.**
- **Deeply acidophilic cytoplasm.**

Peptic (Chief) Cells:

The most numerous type.

Found mainly at the *BASE* of glands.

Pyramidal cells with basal rounded nuclei.

Basal basophilic cytoplasm & *apical zymogen granules*.

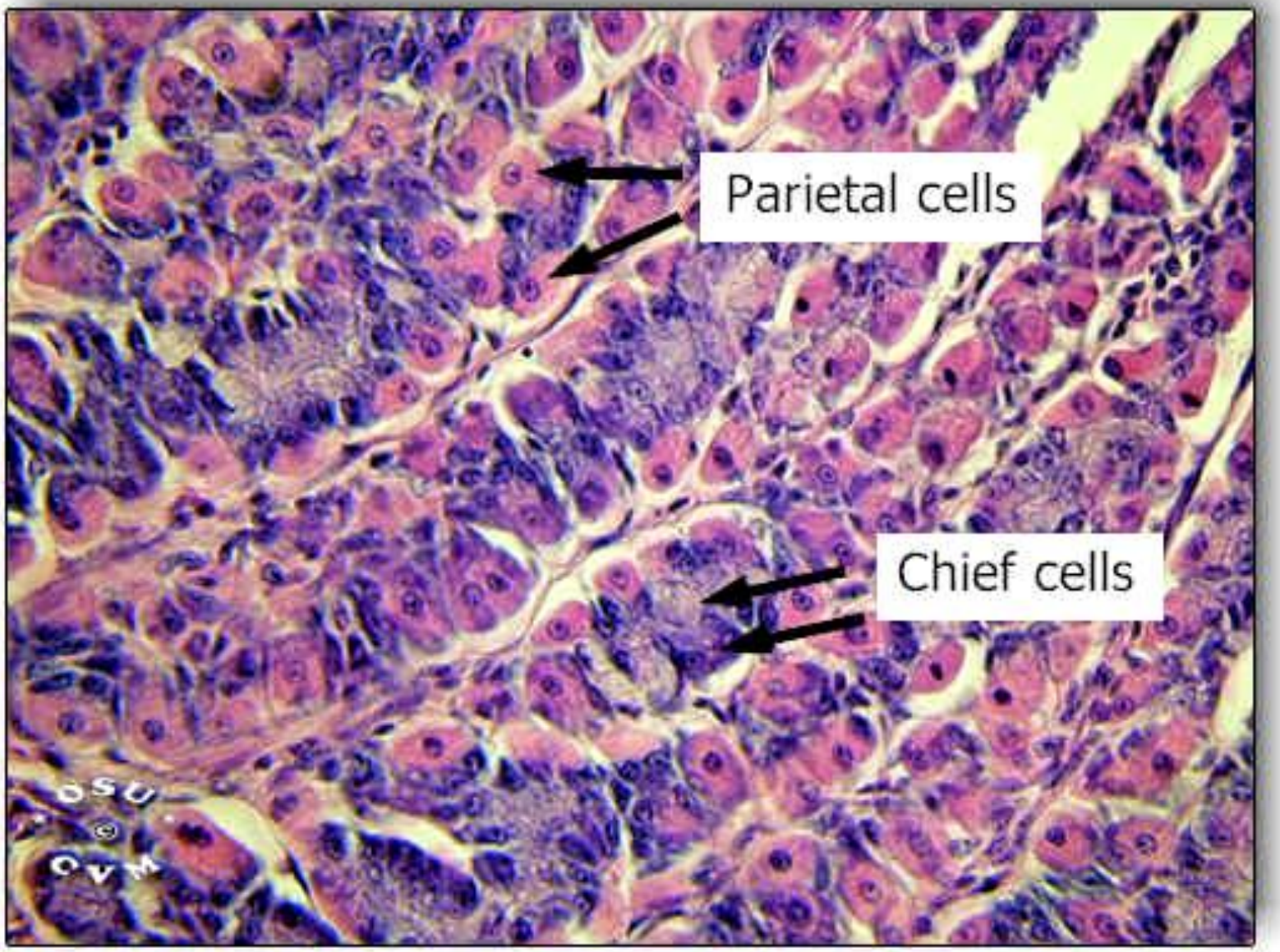
Functions:

Secretion of:

1) Pepsinogen-------Pepsin

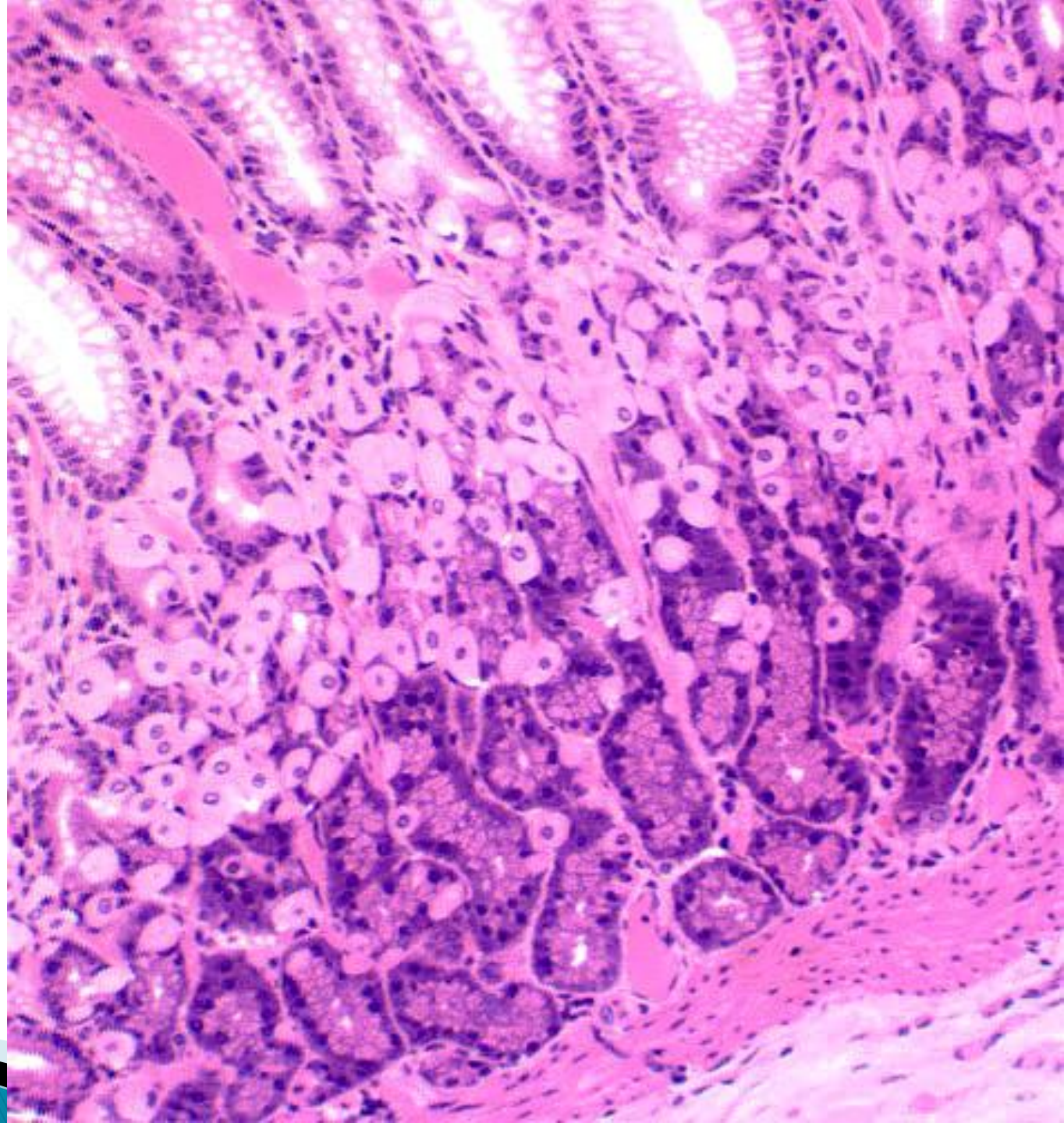
2) Rennin.

3) Little amount of lipase.


Parietal cells
Chief cells
OSU
©
CVM

Fundic Gastric Glands

Parietal Cells



Pylorus

Pyloric Stomach

Pits (P) are Deep, *long* and Wide.

Pyloric Glands:

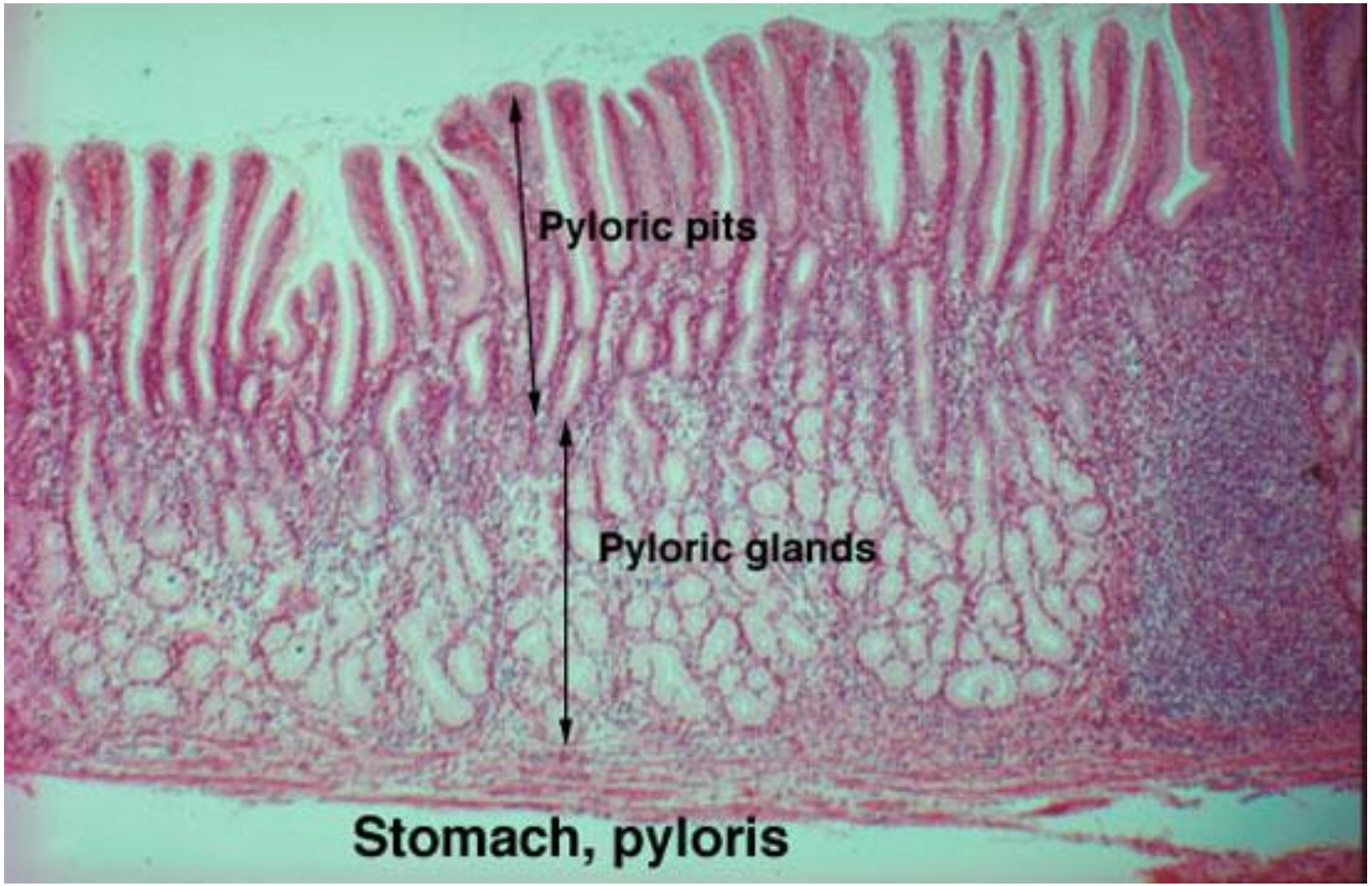
- **Not Crowded, *short* occupy ½ thickness of mucosa.**

- **Highly coiled, branched tubular.**

- **Lined mainly with mucous cells.**

MM – muscularis mucosa

Ratio between Pit (P): secretory Portion (G) : 1:1


Pyloric pits
Pyloric glands
Stomach, pyloris

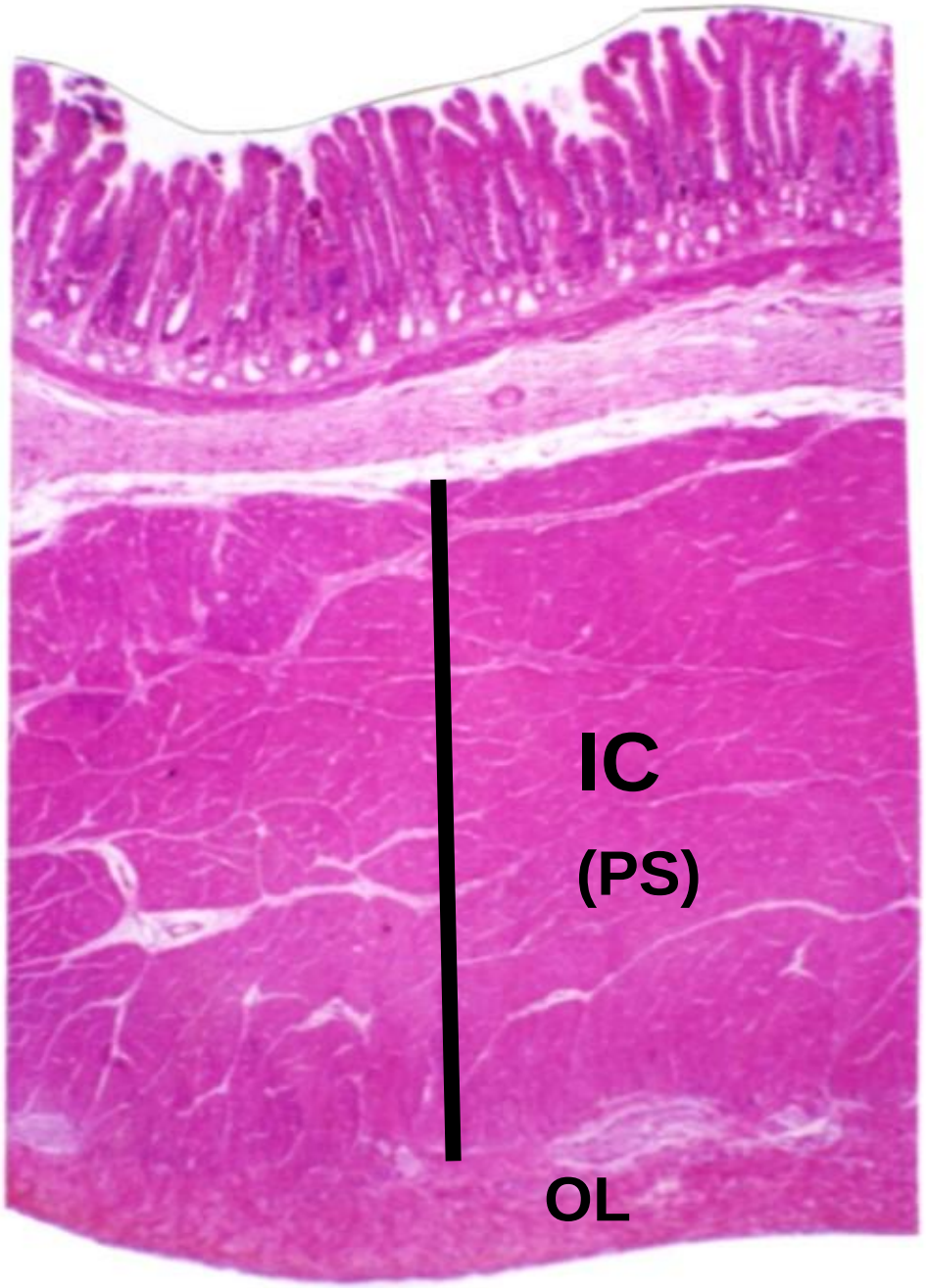
Musculosa Of Pylorus

2 Layers

Inner Circular (IC)

Outer Longitudinal (OL)

Circular muscle is Thickened to form *"Pyloric Sphincter" (PS)*



Pyloroduodenal Junction