2023

Second year

Oral HISTOLOGY

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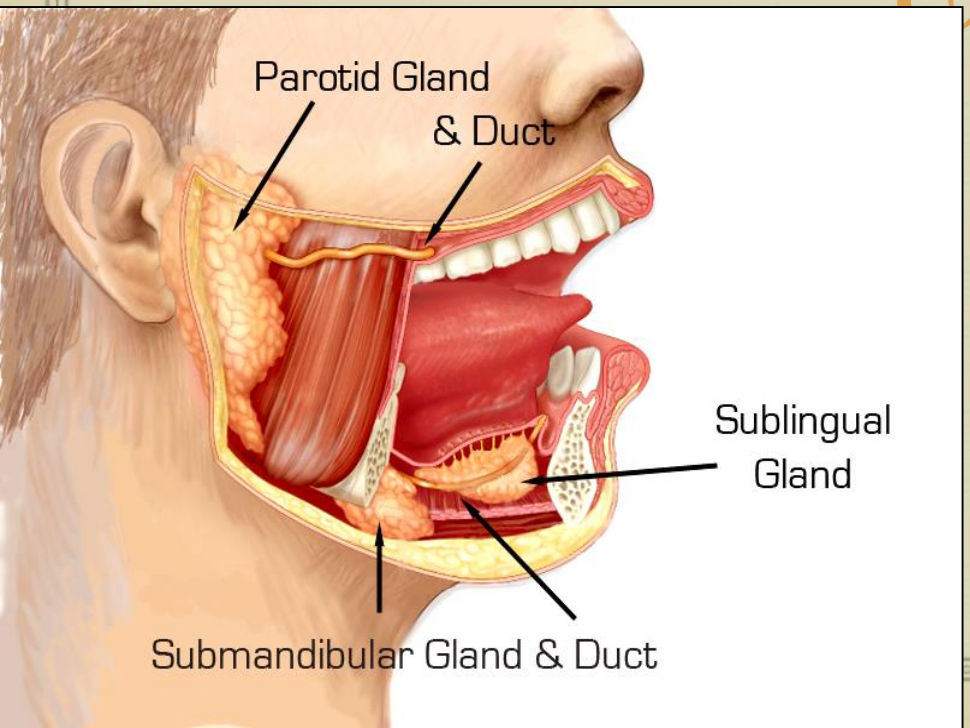
Associated Prof Histology and cell biology

Salivary Glands

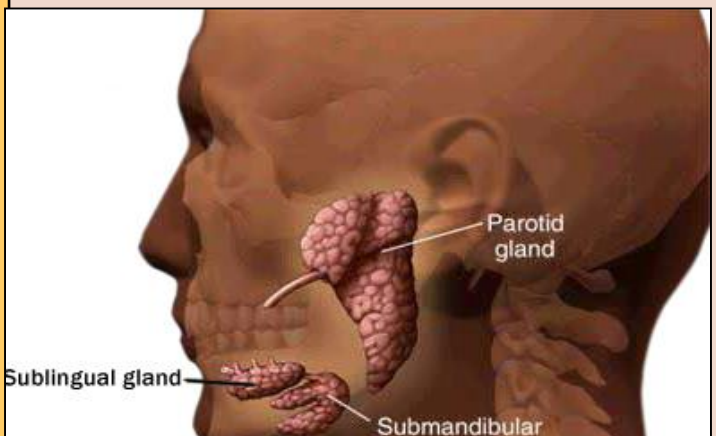
Salivary Glands

Major

Minor

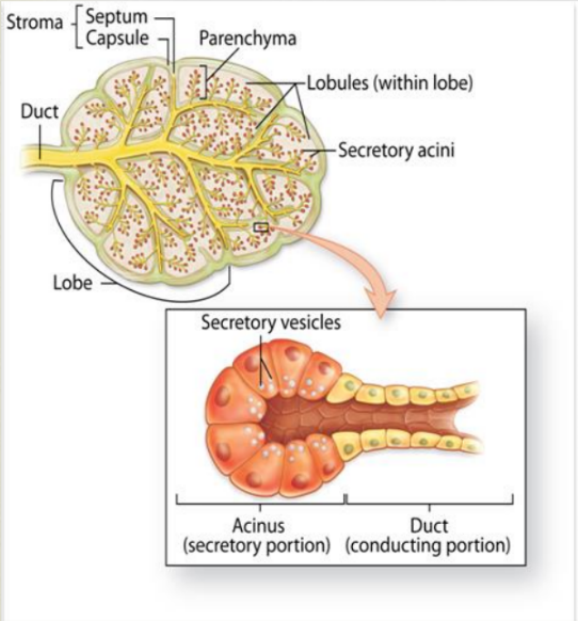


Types of Salivary Glands

	Major Salivary Glands	Minor Salivary Glands
Type	Compound tubulo-alveolar 	Branched tubulo-alveolar 
Secretion	Secrete 90% of the total volume of the saliva.	They secrete 10% of the total volume of saliva
Types & Sites	3 bilateral pairs: 1-Two parotid glands. 2-Two submandibular glands. 3-Two sublingual glands. 	They are scattered in the oral mucosa (in the L.P. under the epithelium). Types: 1- Labial glands (lip) 2-Lingual glands (tongue) 3- Buccal glands (cheeks) 4- Palatine glands (soft palate). Mainly responsible for Mucus secretion. Von Ebner glands (ass. with circumvallate Papilla) are PURELY SEROUS.

Structure of salivary gland

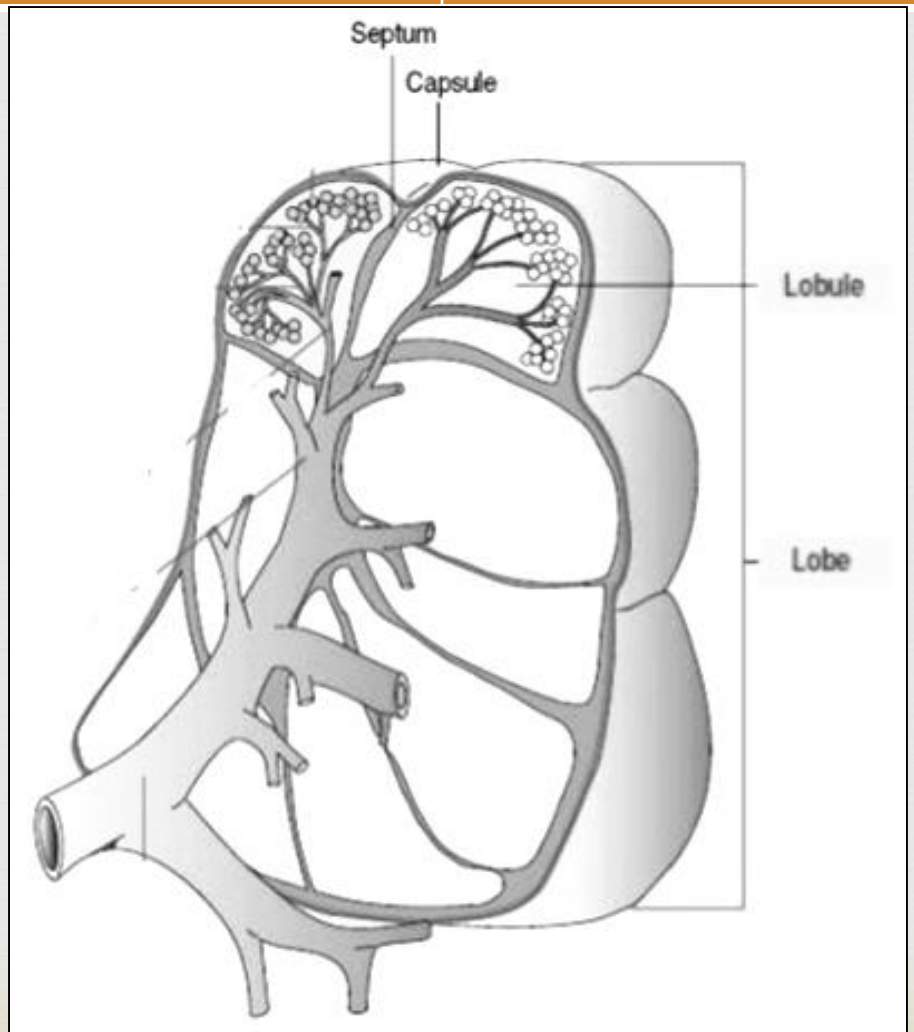
- **Stroma**
  - **Capsule** (dense irregular C.T)
  - **Trabeculae**
    - **Reticular CT**
- **Parynchyma**
  - **ACINI**
    - **Serous**
    - **Mucous**
    - **Mixed**
  - **Ducts**
    - **Intercalated**
    - **Secretory**
    - **Interlobular**
    - **Interlobar**
    - **Main duct**



General Architecture of Major Salivary Glands

I. STROMA:

1- Capsule
2- Trabeculae
3- Reticular C.T.



II. PARENCHYMA:

1- Secretory Portion (Acini):
Serous / Mucous / Mixed.

2- Excretory Portion (Duct System).

I. STROMA:

- A. Capsule: Dense irregular C.T.

- B. Trabeculae: Septa divide gland into lobes & lobules.- Carry blood vessels & excretory ducts.

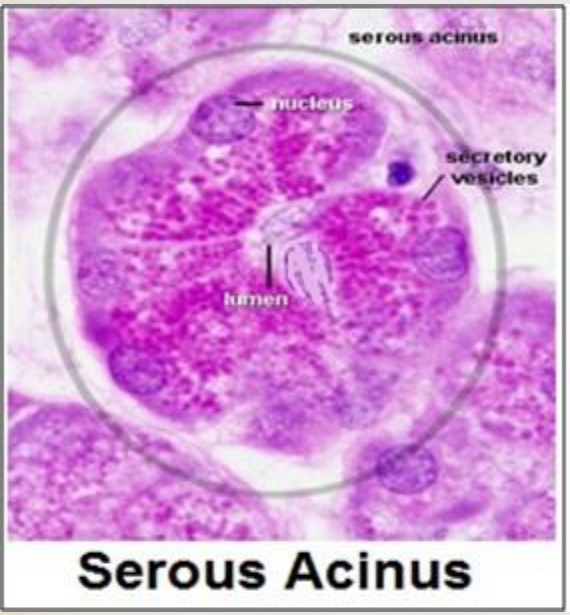
- C. Reticular Stroma: Network of reticular fibers in the background.
- Stained brown with Ag

II. PARENCHYMA:

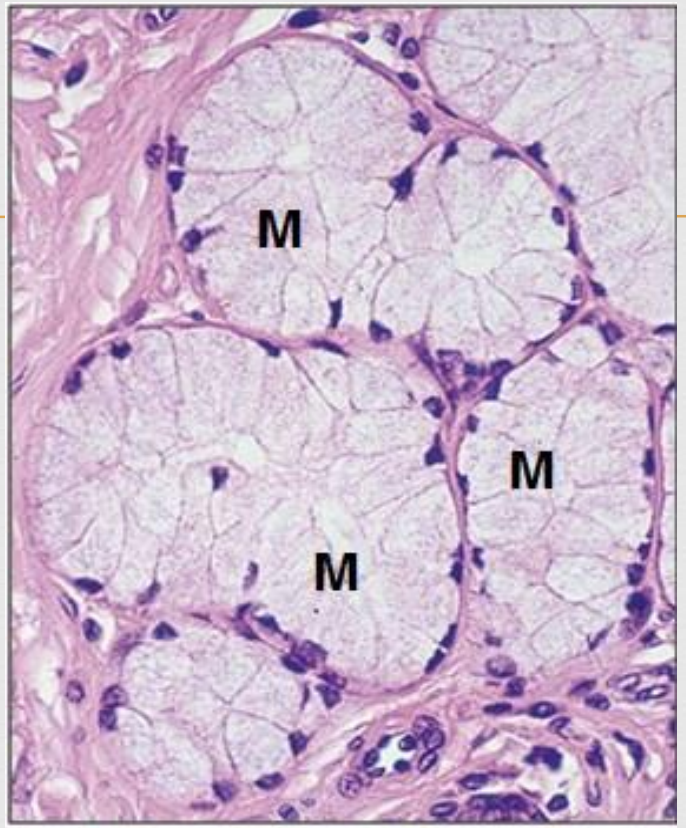
1. Secretory Portion:	2. Duct System:
Secretory cells are organized to form spherical masses of cells called Acini. There are 3 types of acini: Serous, Mucous & Mixed (Mucoserous).	Highly branched and range from small ducts to very large (main) ducts.
Surrounded by MYOEPITHELIAL CELLS	Intercalated ducts are surrounded by MYOEPITHELIAL CELLS

squeeze the acini

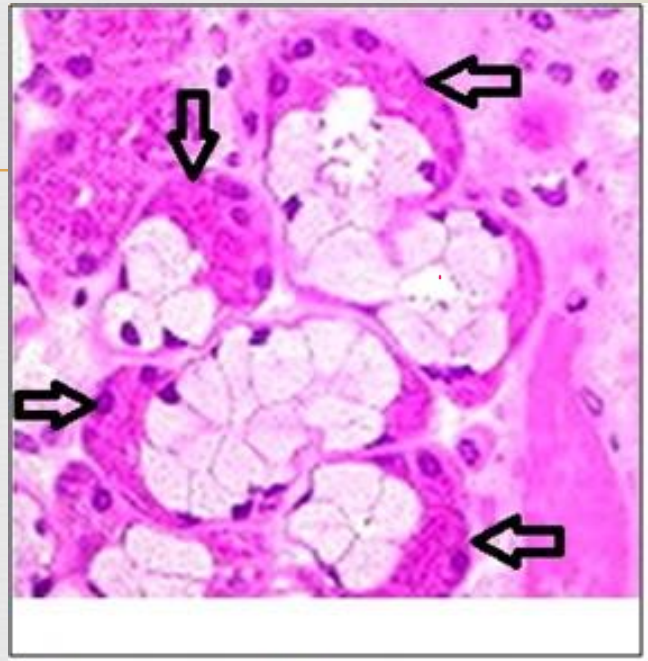
Types of Acini in Salivary Glands



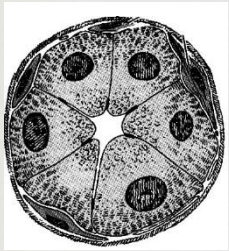
Serous Acinus

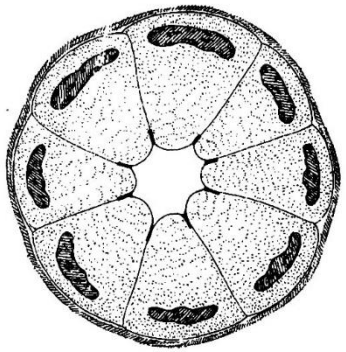


Mucous Acini

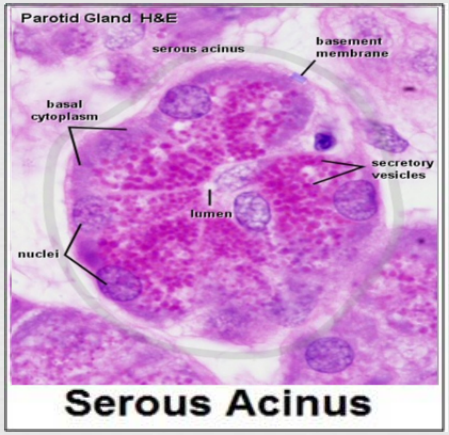


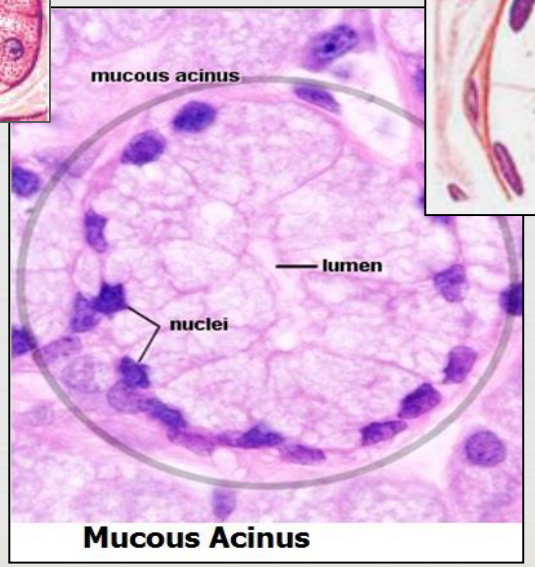
Mixed acini showing serous demilune

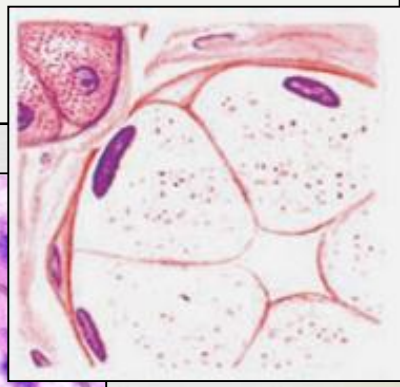




L.M.	Serous Acinus	Mucous Acinus
Diameter & Lumen	Small Diameter/ narrow Lumen	Large Diameter / wide lumen
Secretory cells: Nuclei	Pyramidal [ill-distinct boundaries] central rounded nuclei	Cuboidal / Columnar [distinct boundaries] basal flattened nuclei
Cytoplasm	Basal Basophilia (Due to the Presence of RER) with apical acidophilic zymogen granules	Pale foamy cytoplasm
Myoepithelial Cells	Few	Many



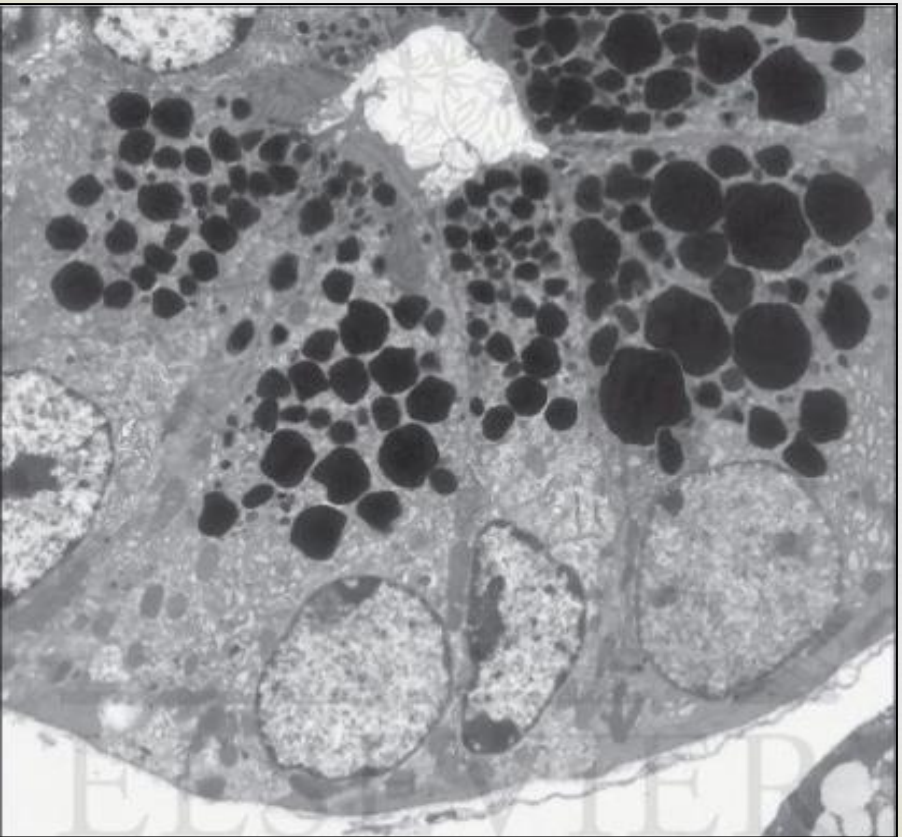


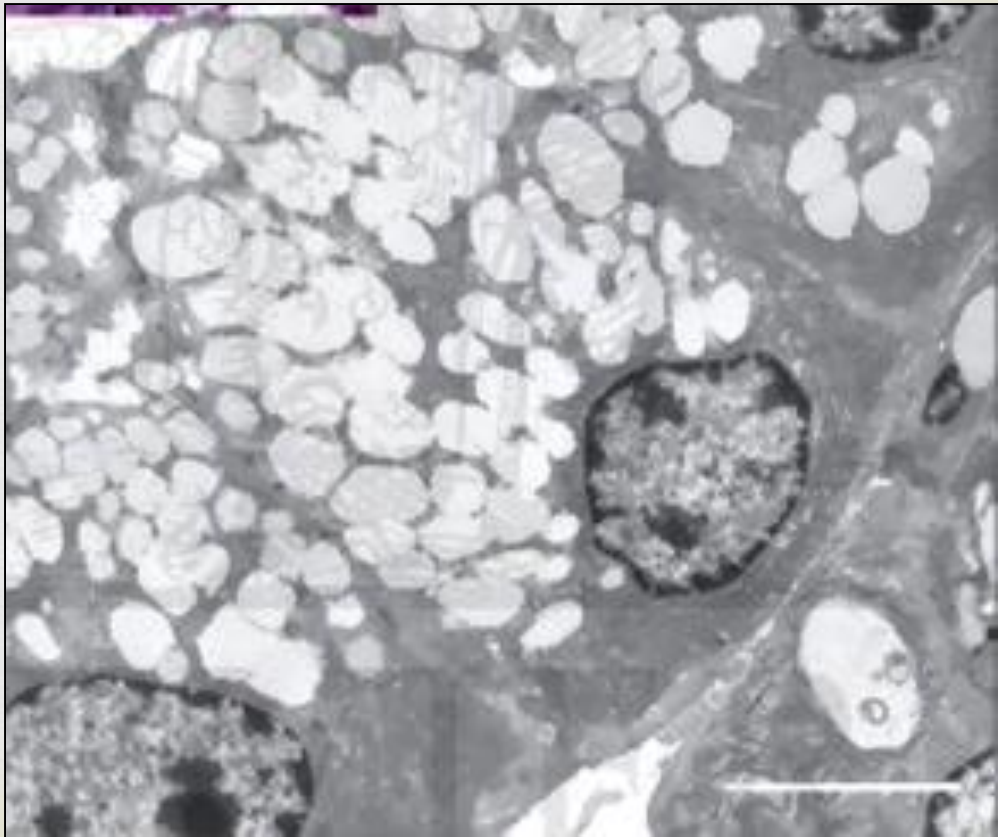


E.M. : Both are “Protein-Secreting Cells”. However,

Apical membrane-bound Electron-dense Secretory granules. Basal rER

Membrane-bound Electro-lucent Mucinogen granules.

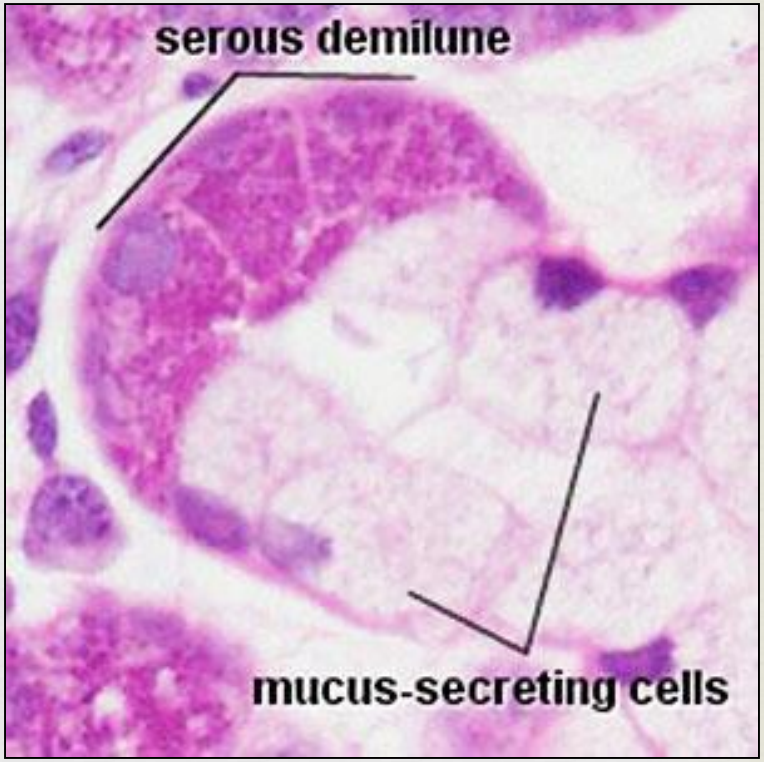




Mixed Acinus

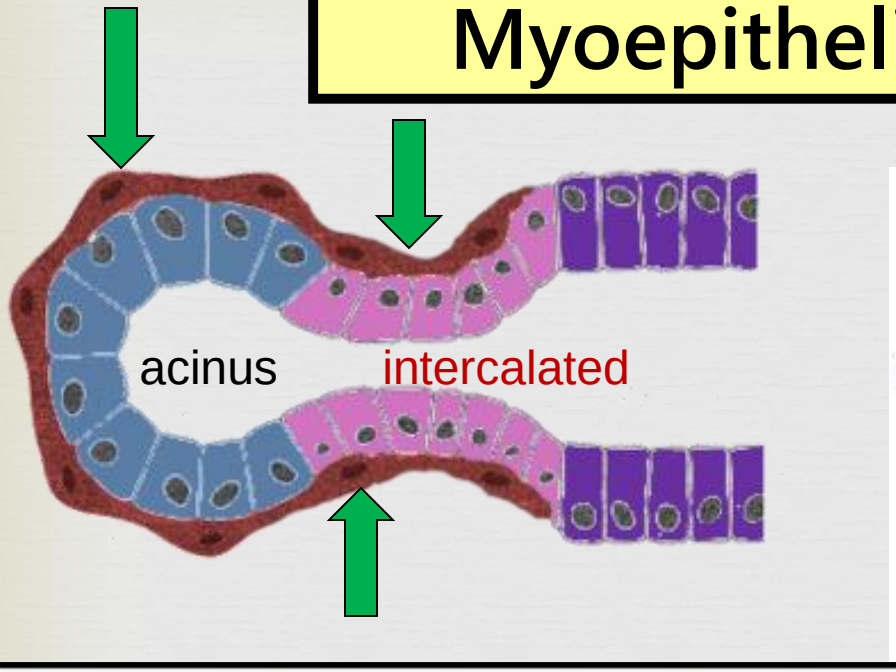
Mixed Acinus

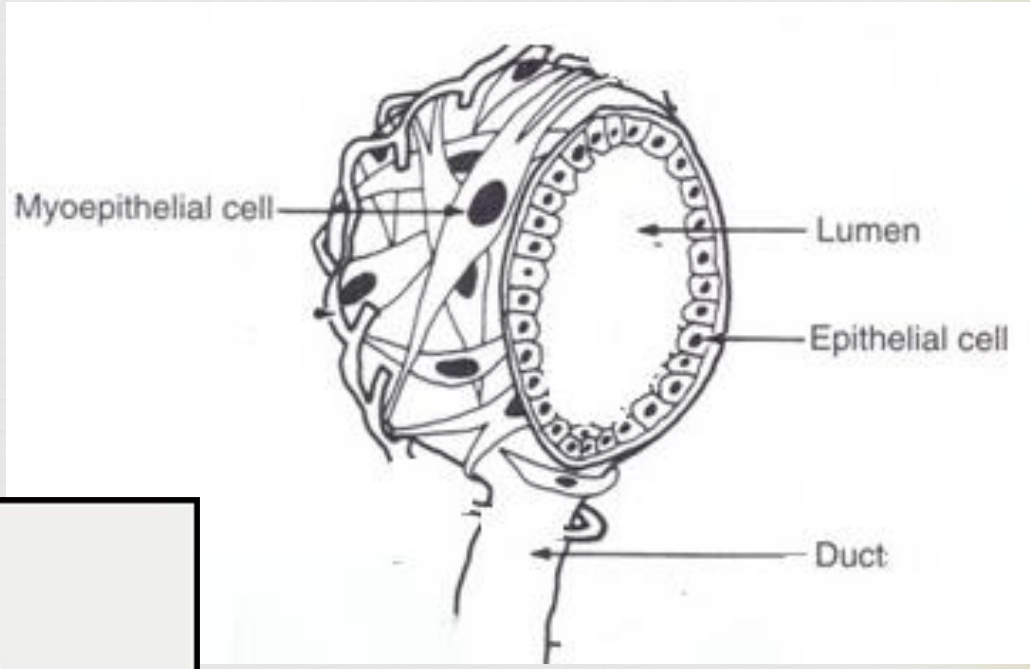
Mucous acinus (M) capped by Serous Demilune (S) / Crescent of Giannuzi [formed of serous cells]

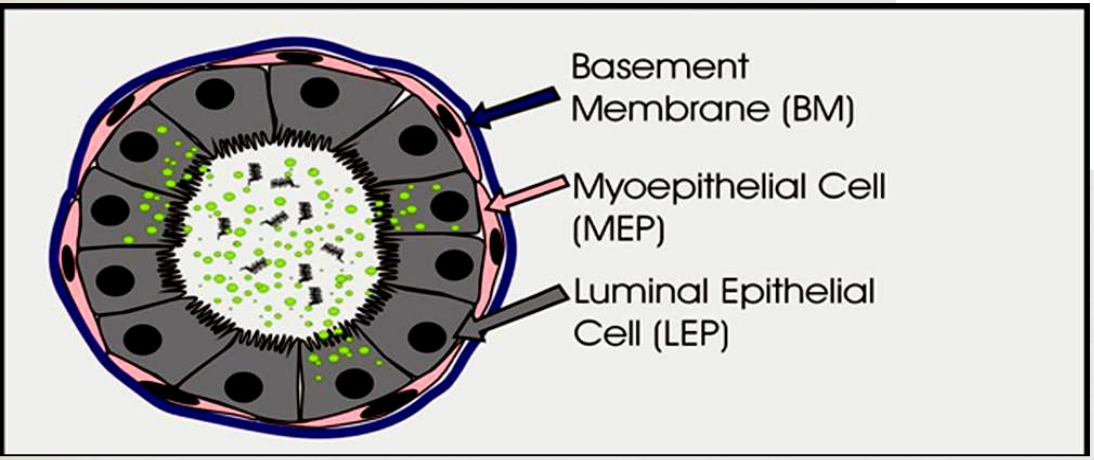


E.M. Picture of a Mixed acinus.

Myoepithelial Cells (Basket Cells)



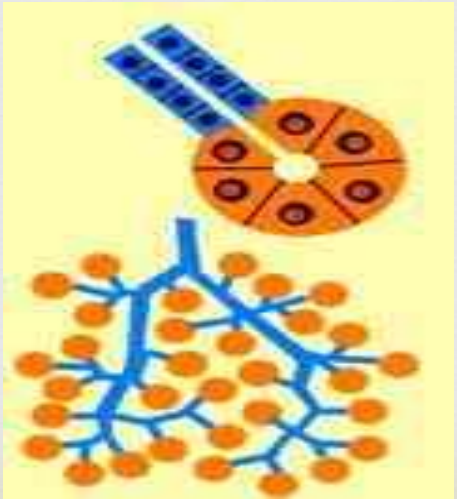


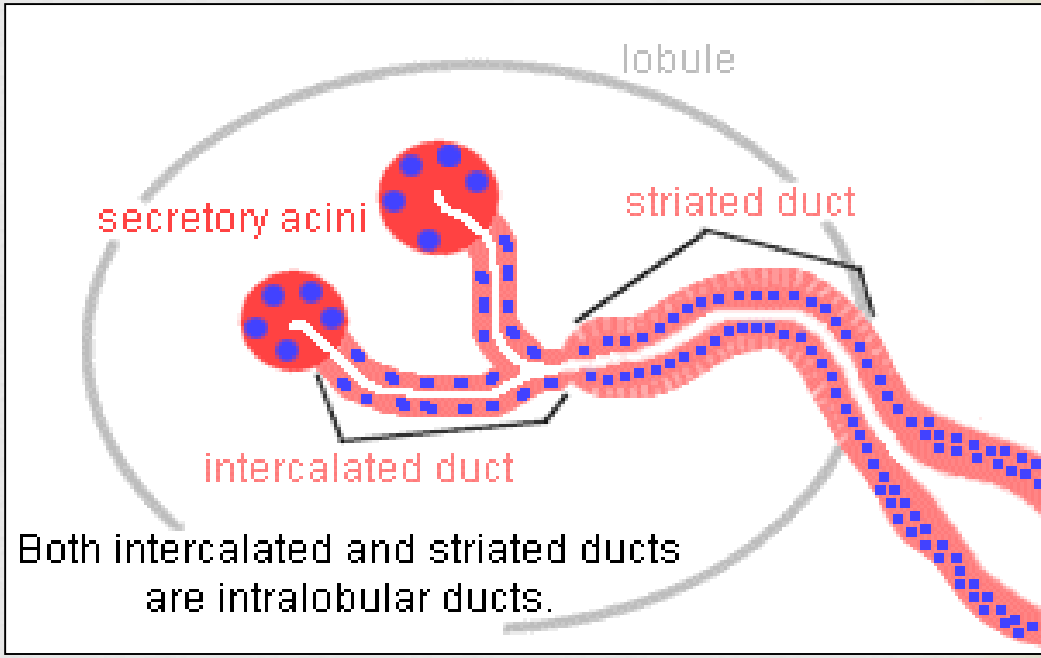


Stellate-shaped cells which embrace <u>acini</u> & <u>ducts</u> <u>(intercalated)</u> as an octopus.

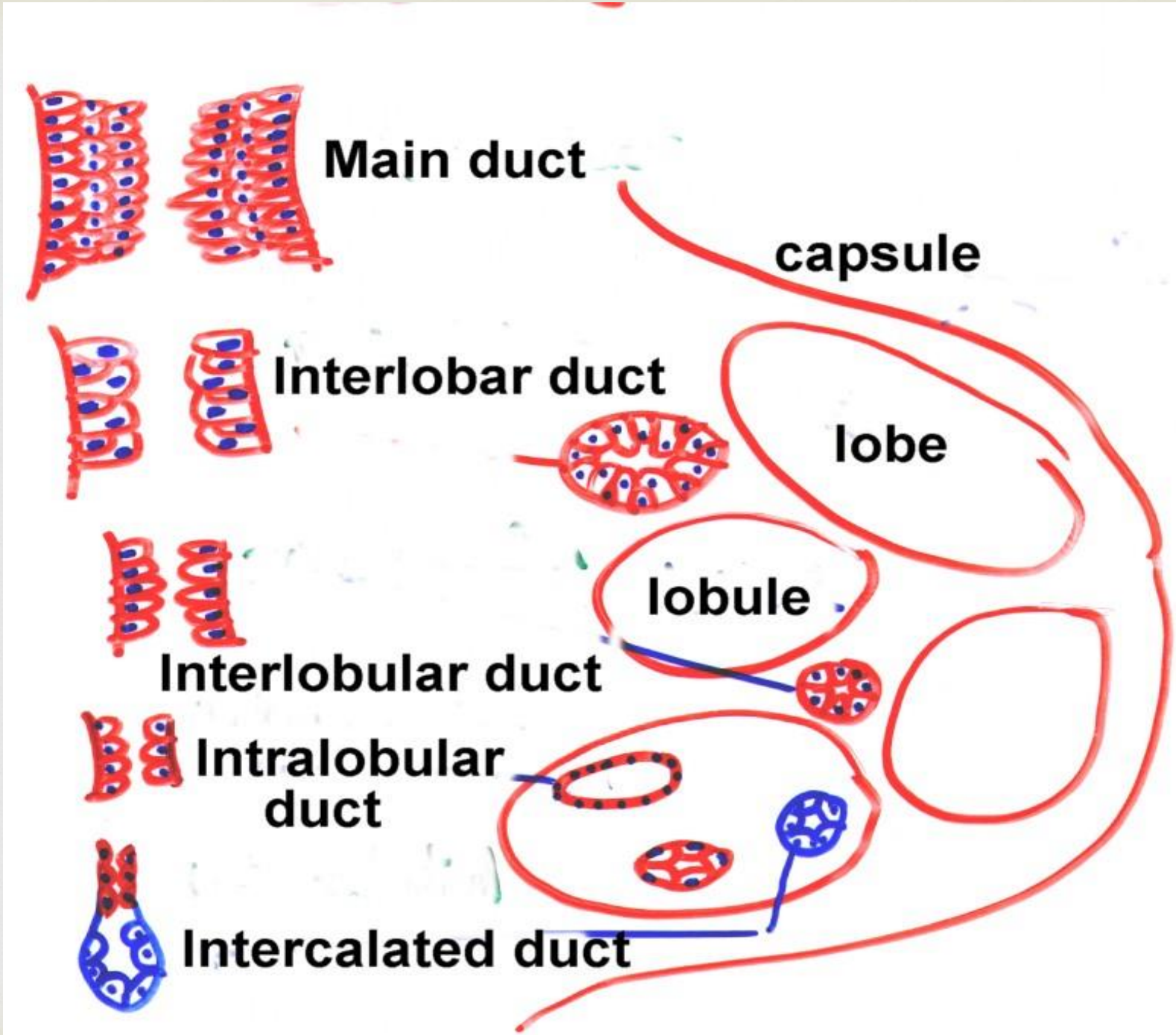
DUCT SYSTEM

- Intralobular Duct
  - Intercalated duct
  - Striated duct (secretory)
- Interlobular Duct
- Main Duct





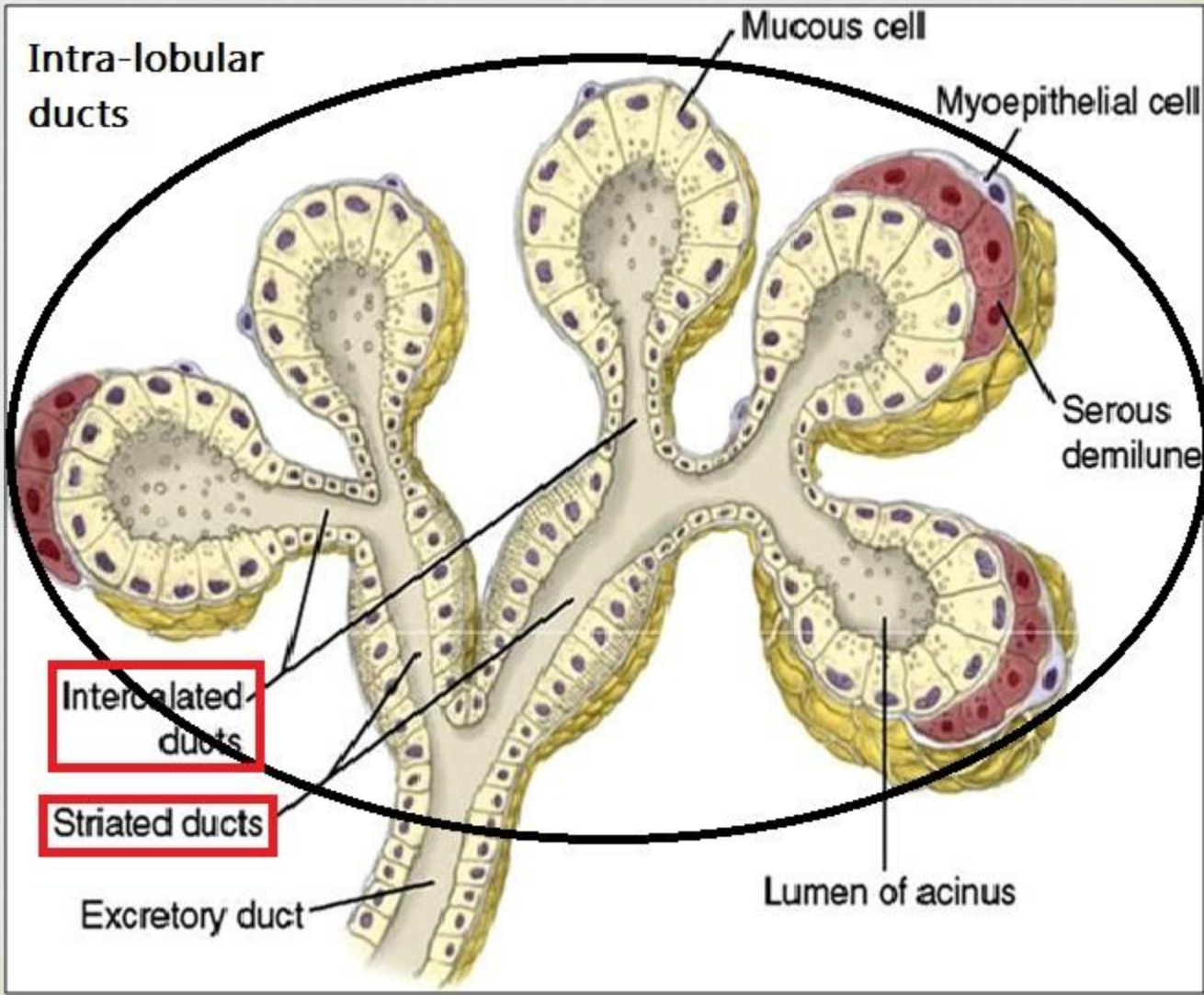
Acini and their duct system resemble grapes attached to a stem.


Main duct
capsule
Interlobar duct
lobe
lobule
Interlobular duct
Intralobular duct
Intercalated duct

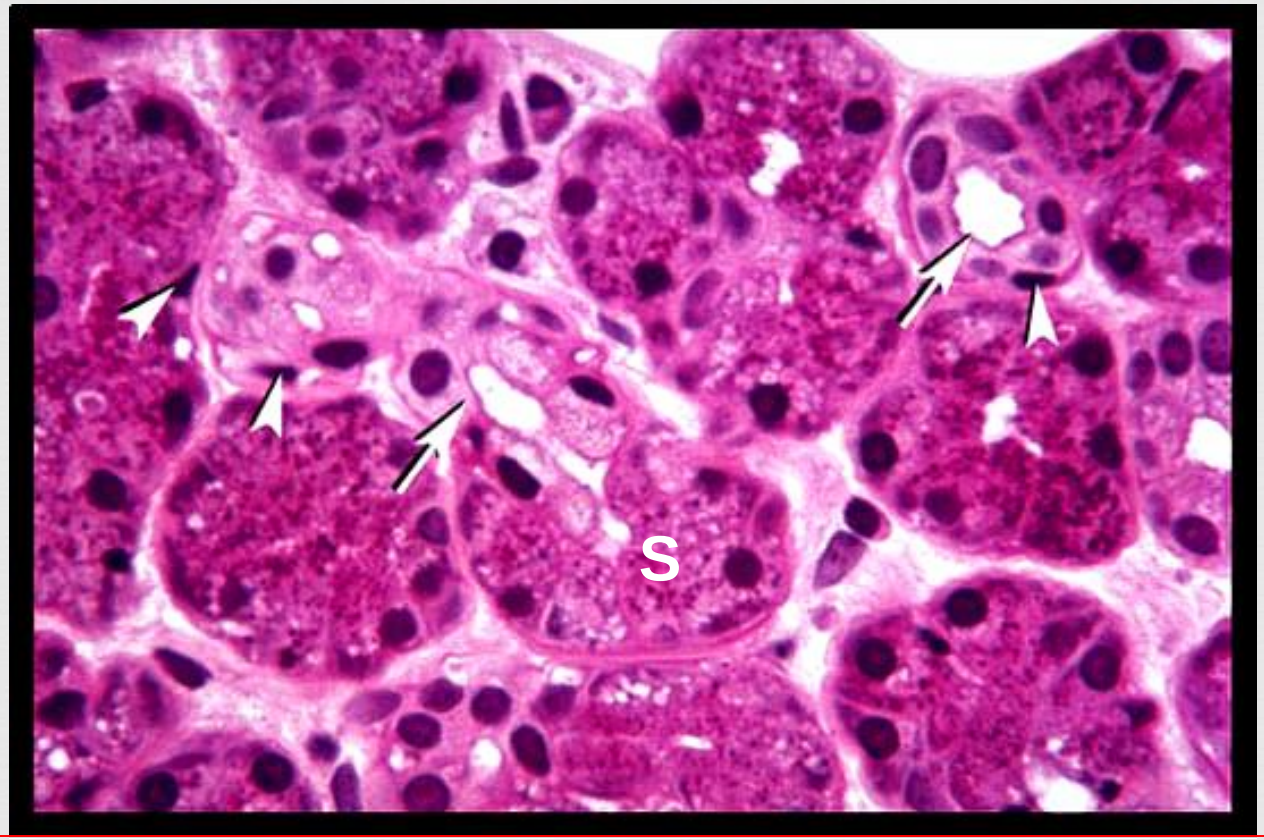
(I) Intralobular Ducts:

1) **Intercalated ducts:** Simple cubical epithelium.
Surrounded by some myoepithelial cells.

2) **Striated ducts:**
Cuboidal to low columnar cells with rounded nuclei.

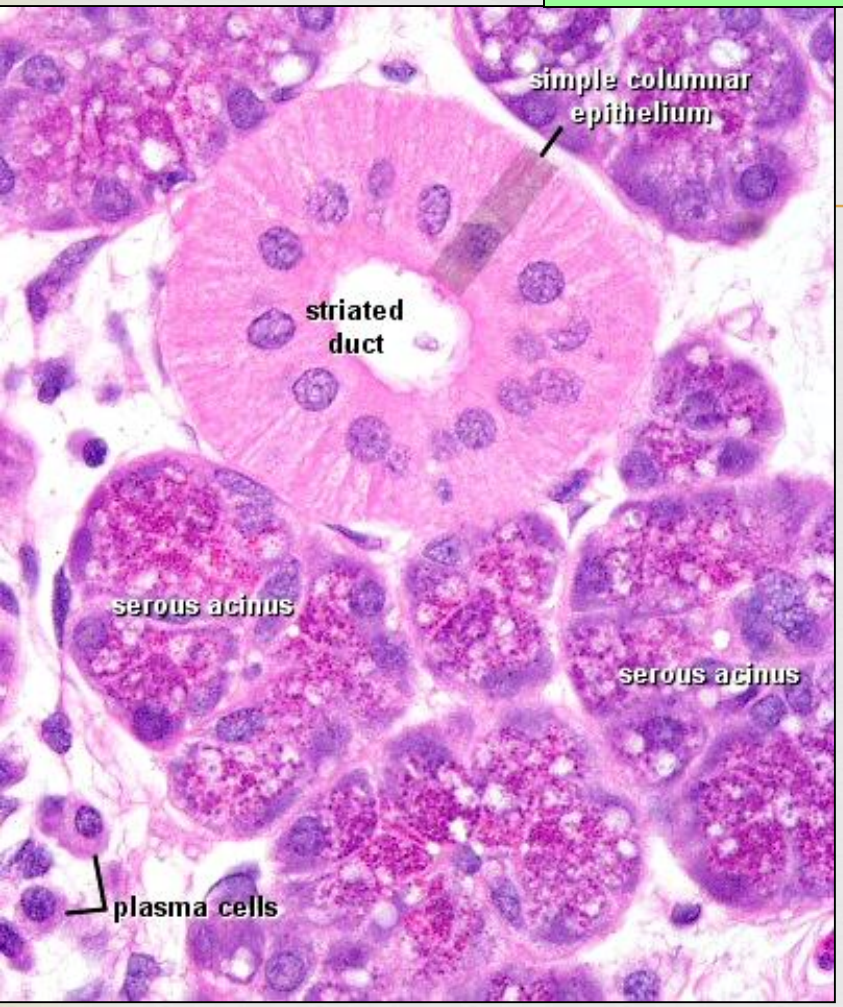


Intercalated Duct_(arrows)

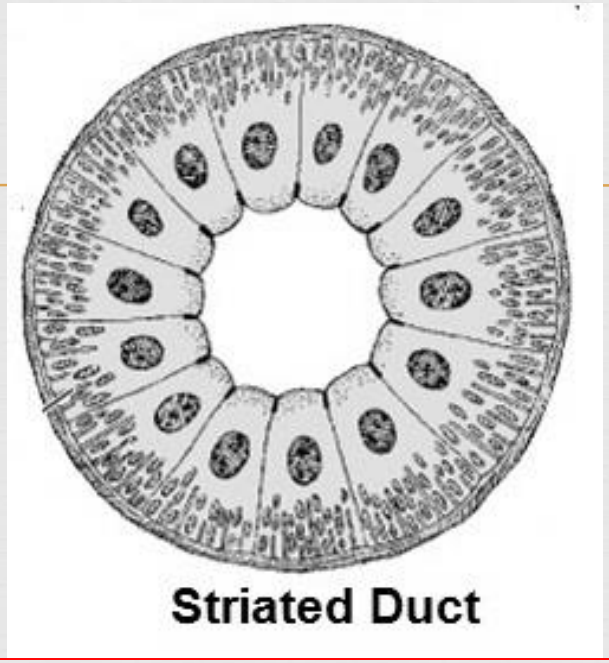


It extends from a secretory acinus (S)
Acini empty their secretions into these ducts,
Lined with *Simple cubical epithelium*.
Have acidophilic cytoplasm.
Surrounded by myoepithelial cells (arrowheads)

Striated Ducts



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



L.M.:

- Lined by a single layer of cuboidal to low columnar cells.
- Cytoplasm: Acidophilic granular with basal striations

Nucleus: Central rounded nuclei.

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.

(II) Excretory Ducts:

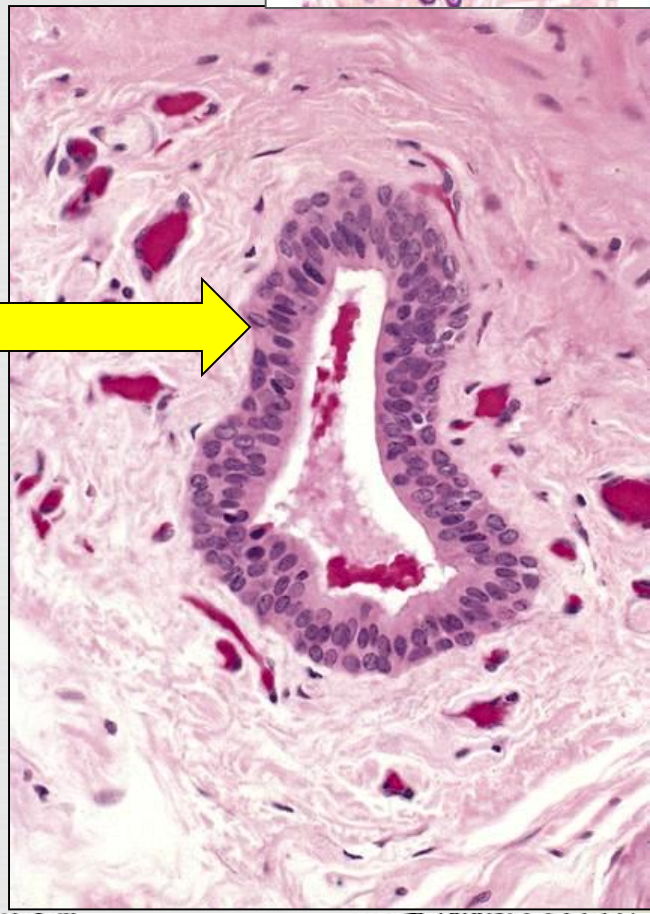
1) Interlobular ducts:

Present in the septa between the lobules

-Small ducts are lined with **columnar epithelium** and

-2-interlobar ducts are lined with **pseudostratified columnar epithelium**

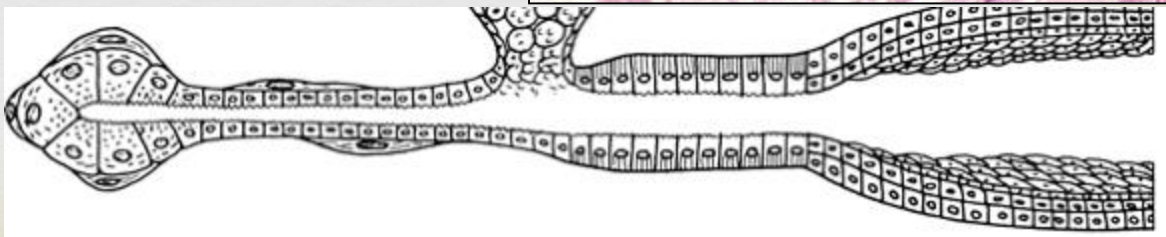
Ducts embedded in dense fibrous CT



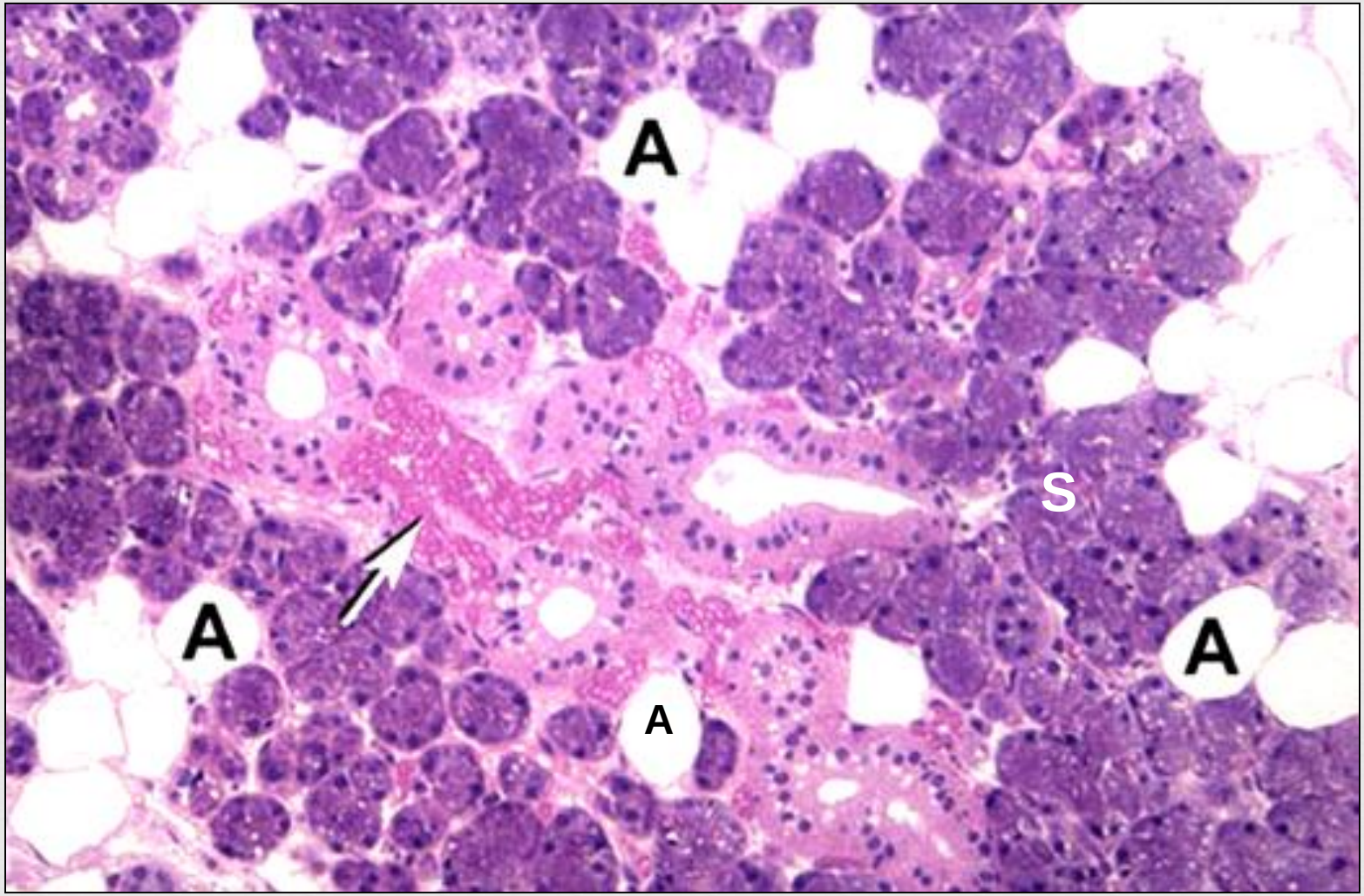
2) Main Duct:

The proximal part is lined with stratified columnar epithelium.

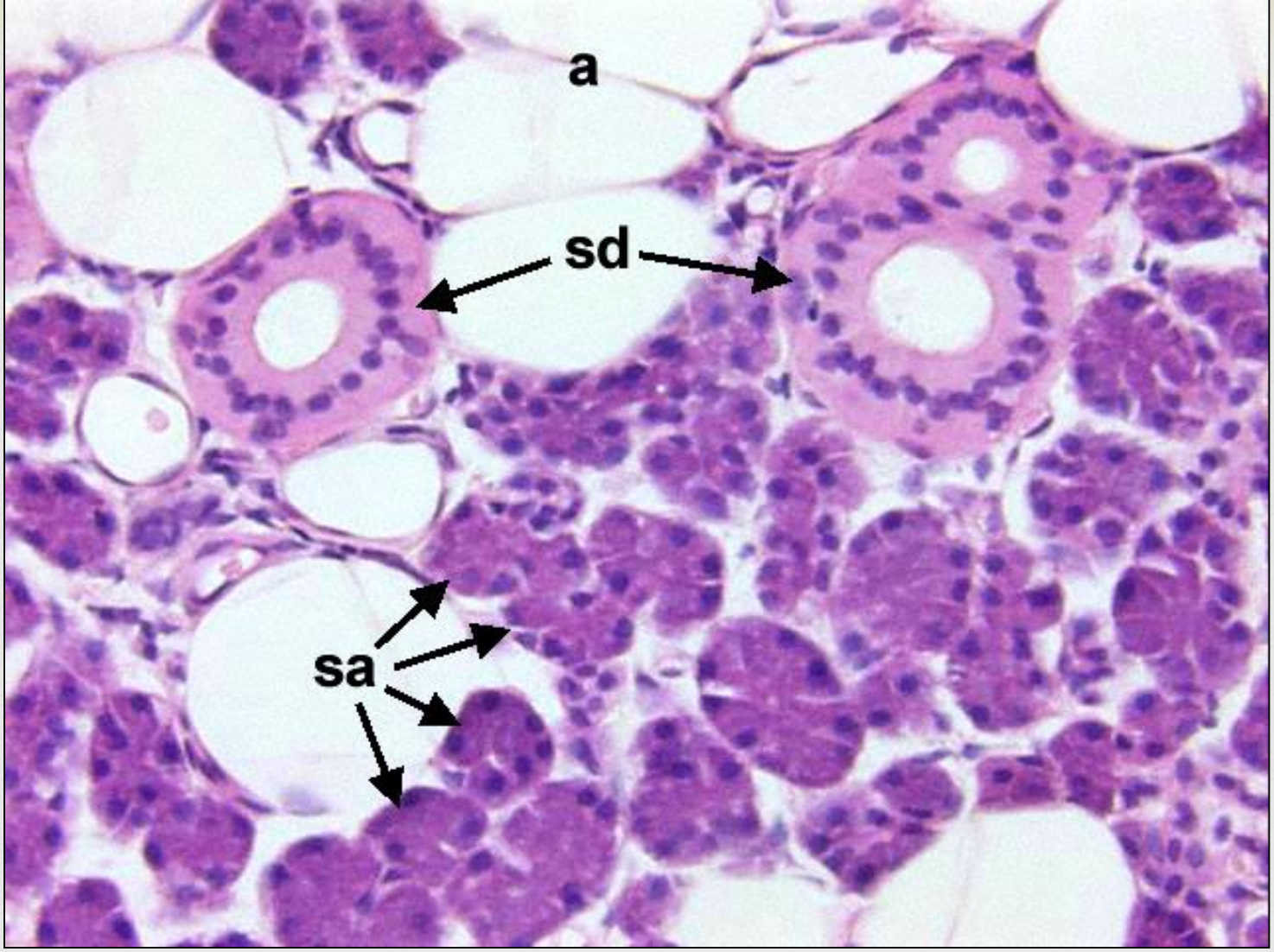
-The distal end is lined with stratified squamous non-keratinized epithelium which opens into the mouth cavity.



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:

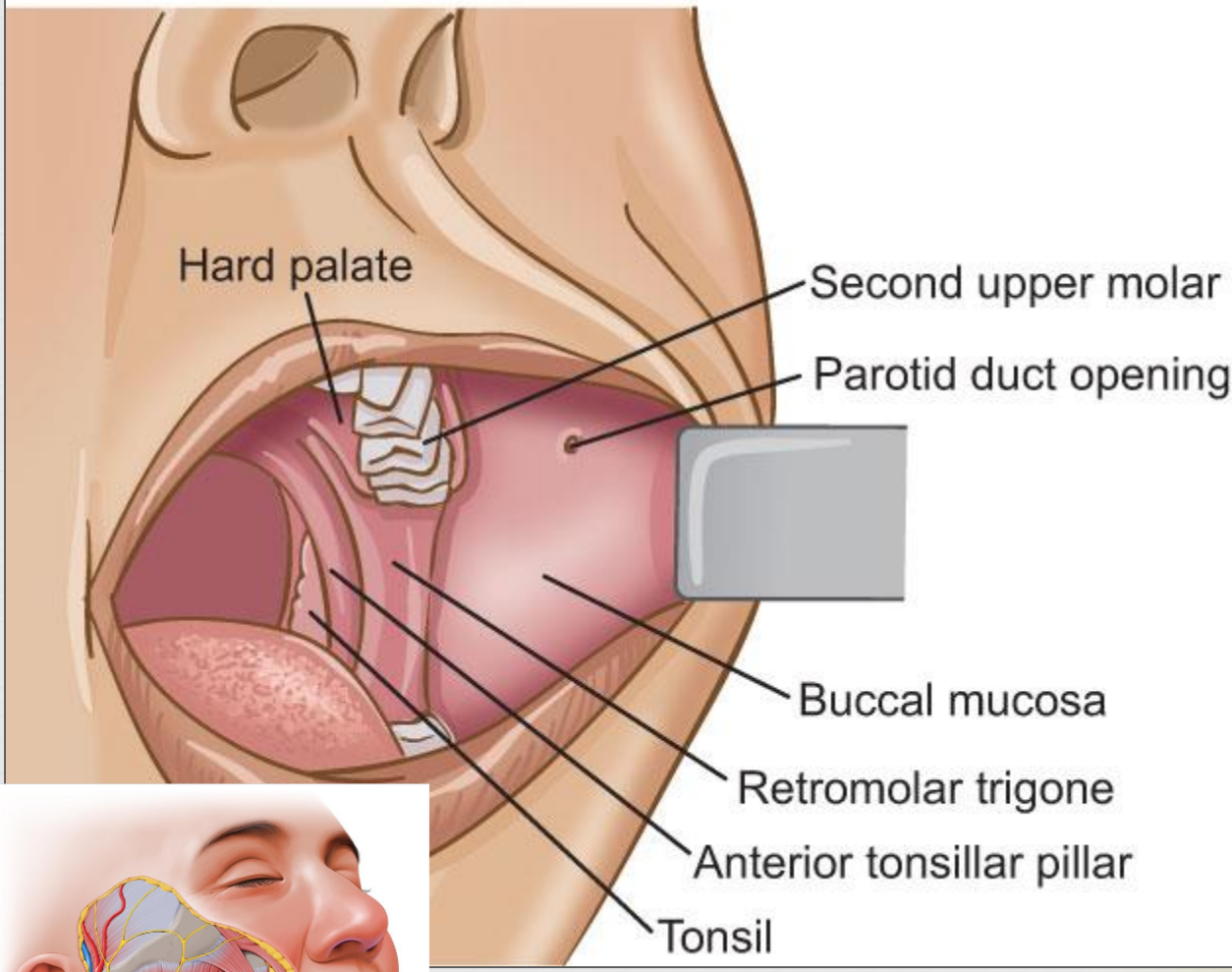
1- All the acini in the field are ---------serous acini- (sa) --------

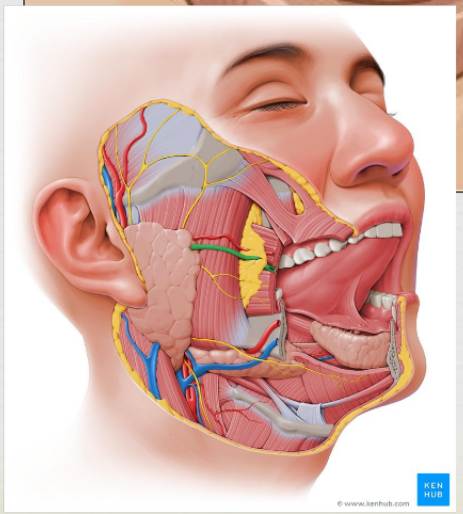
2- Many ------striated ducts (sd): --. They are located--intralobular-------.

3- Many adipocytes (a).

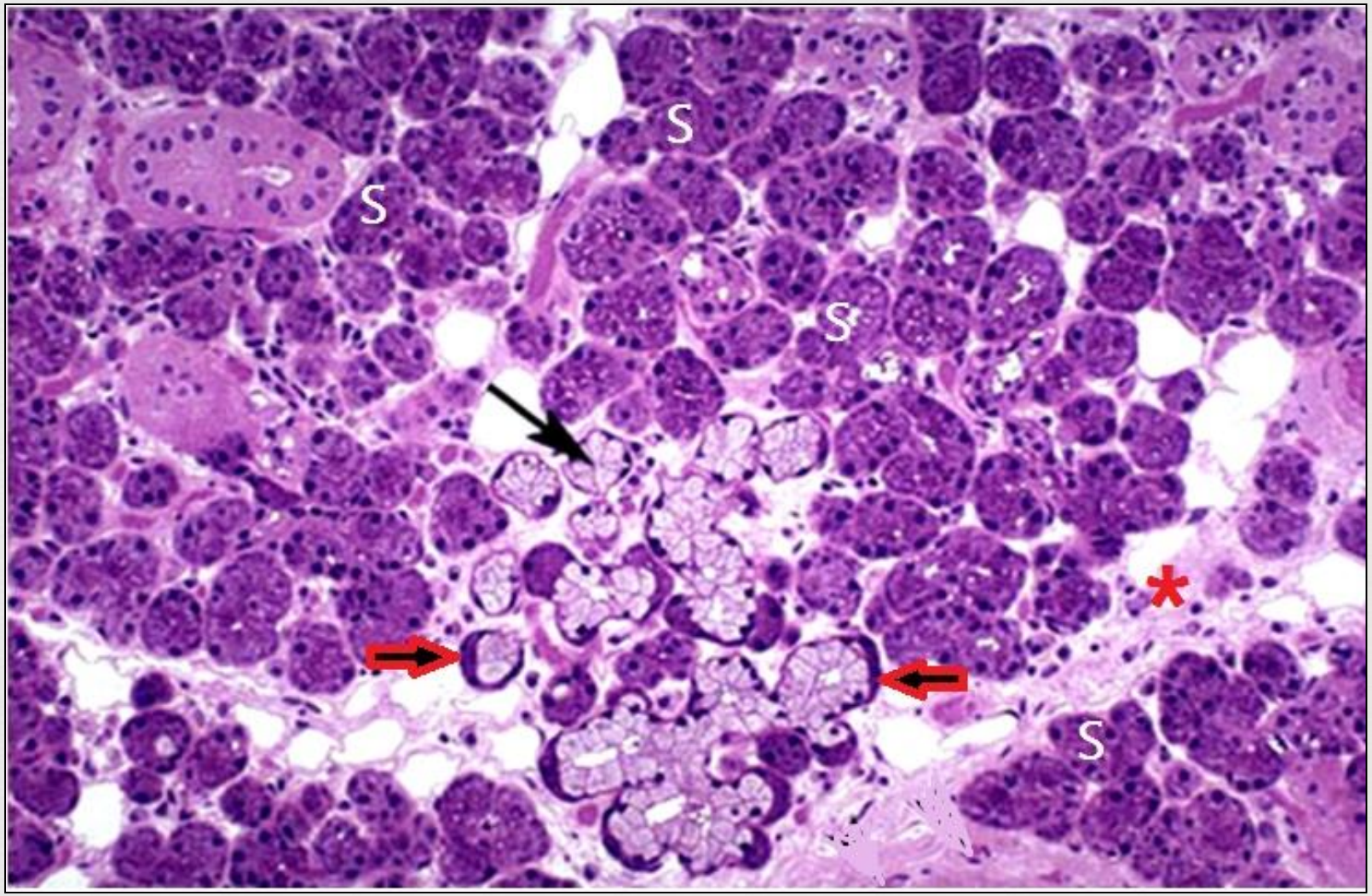
Main Parotid duct (Stenson's duct)

Stenson's duct, leaves the gland and pierces through fat and muscle to open into the mouth opposite the second upper molar





Submandibular Gland

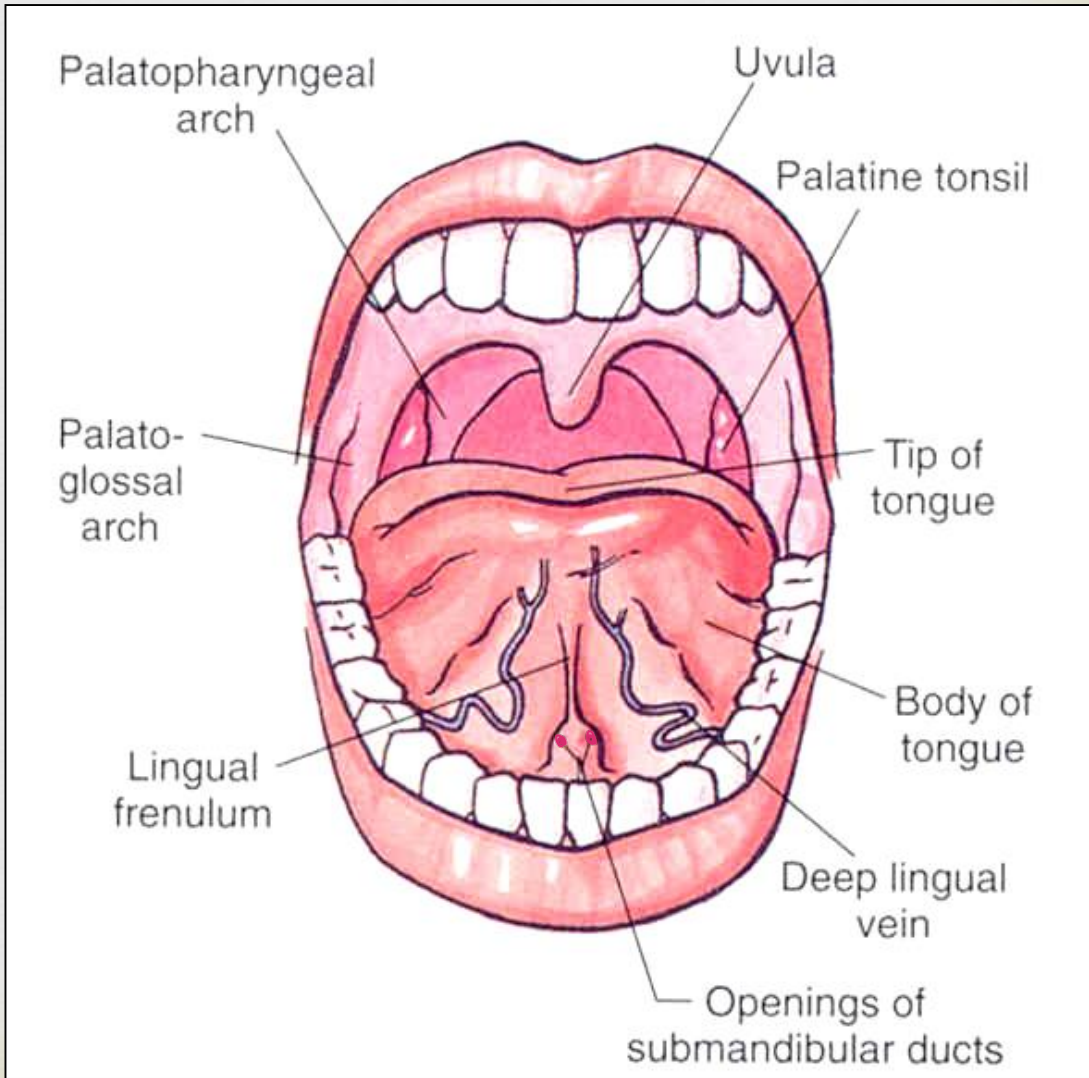


Seromucous Gland

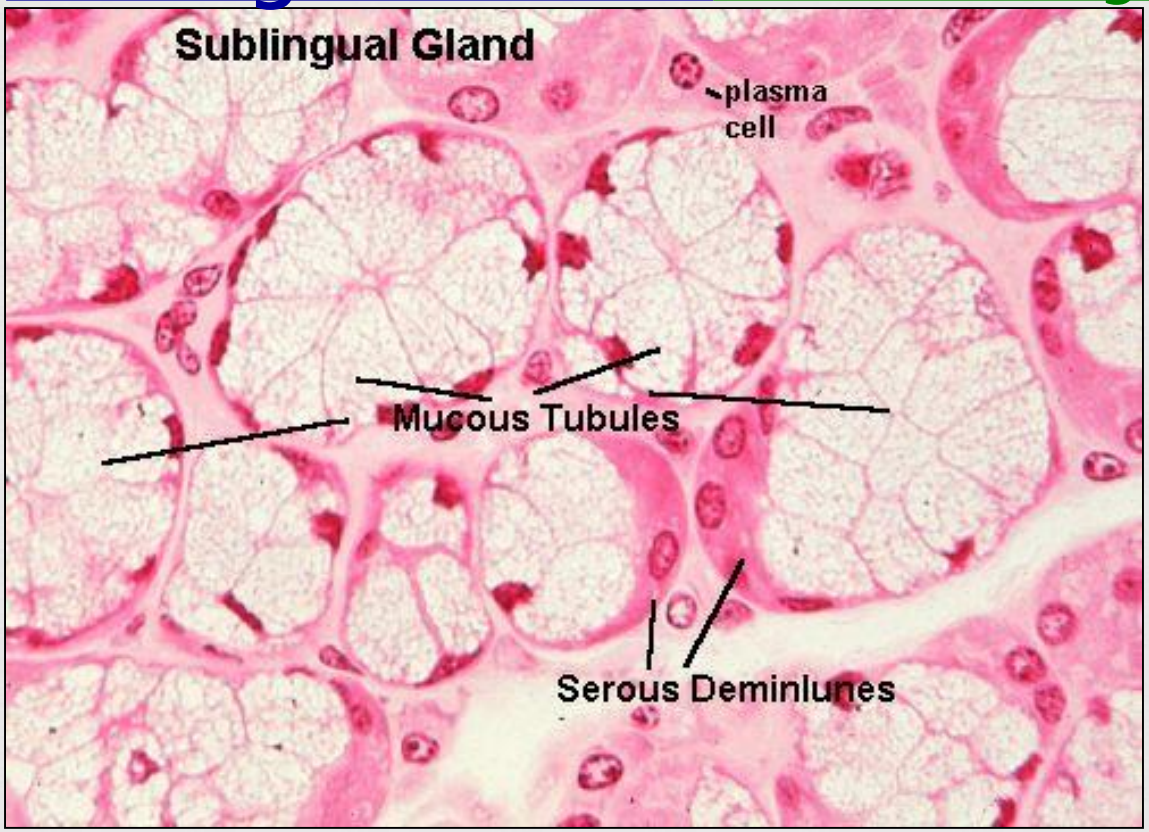
In humans, 90% of its acini are serous (S) & 10% are mucous (black arrow) and mixed (red arrows). Star: Thick septa rich in fat cells.

Main duct of submandibular gland (Wharton´s duct)

(Wharton´s duct) opens on the floor of the mouth at the sides of tongue frenulum



Sublingual Gland (the smallest gland)



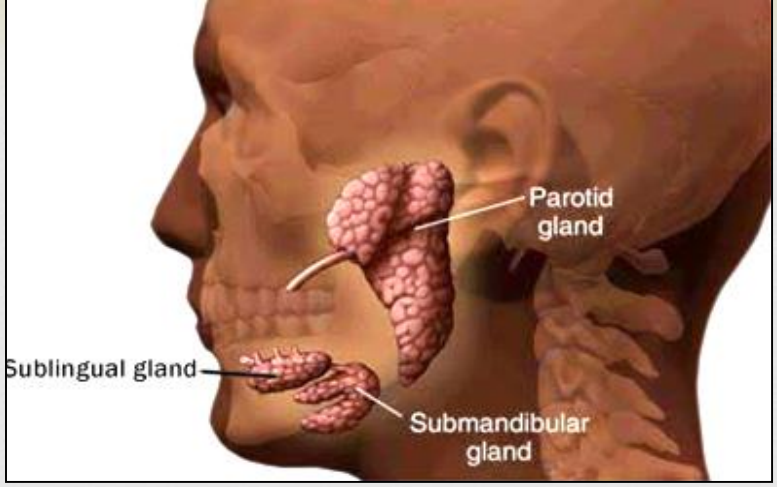
Mucoserous gland

Mucous acini predominate.

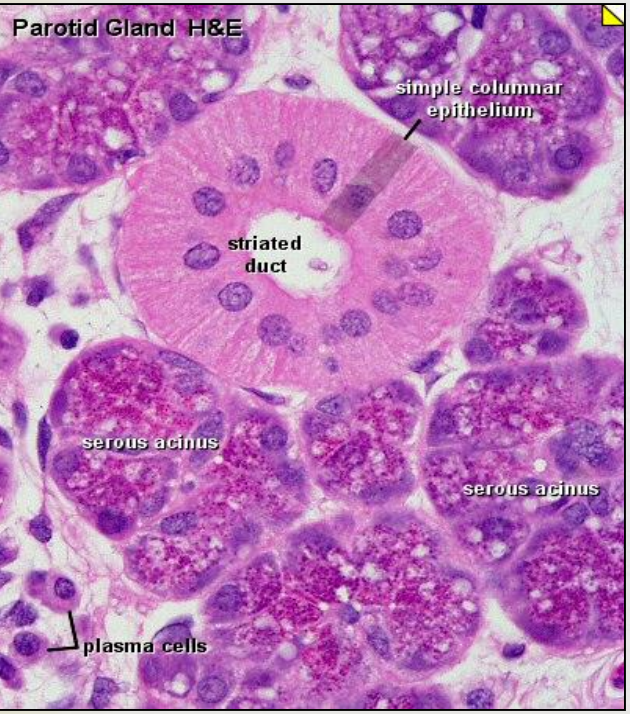
Some mixed acini.

NO purely serous acini.

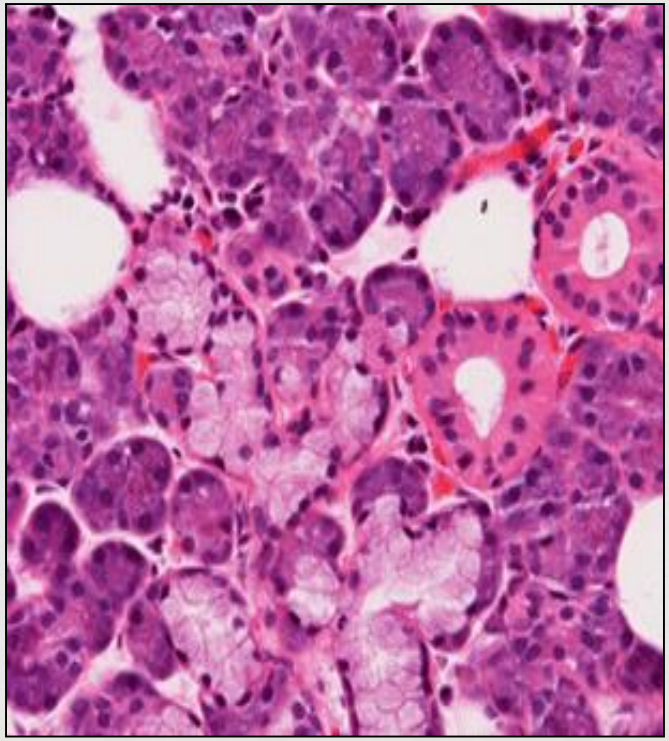
Few, less-developed intercalated and striated ducts.



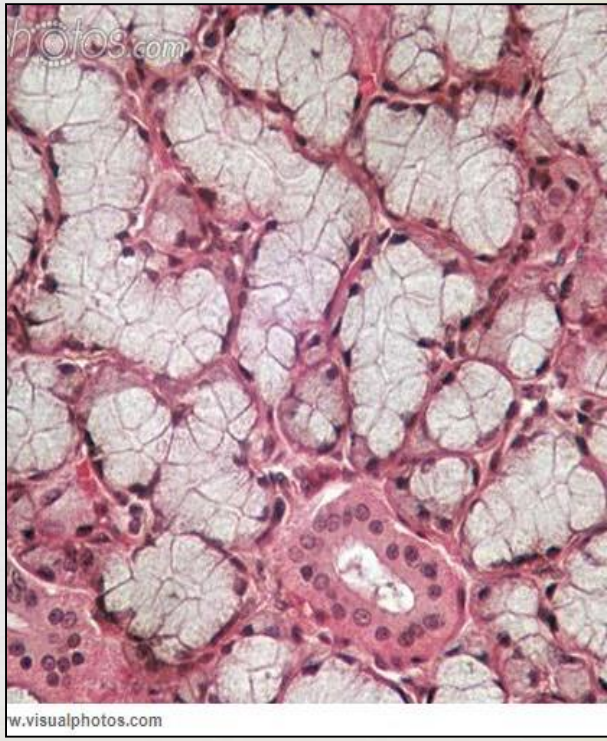
Parotid



Submandibular



Sublingual



###	Parotid gland	Submandibular	Sublingual gland
Capsule:	-Thick	- Thick capsule	- Thin capsule
Septa:	-Thick, rich in fat	-Thick septa, less fat	- Thick septa
Parenchyma			
Acini	**Purely Serous**	**Mixed [Seromucous]**	**Mixed [Mucoserous]**
		Predominant serous (90%) + 10% Mucous acini & Mixed	**Predominant mucous** + mixed acini. **NO** purely serous acini.
Ducts	**Prominent intralobular ducts**	**Present**	**Fewer**
Main duct	opens opposite upper 2nd molar tooth	opens on the floor of the mouth at the sides of tongue frenulum	Open by numerous ducts posterior to ducts of submandibular gl.
	Secrete 25% of saliva	**70%**	**5%**