

# HISTOLOGY AND EMBRYOLOGY OF SALIVARY GLANDS

ANATOMY DEPARTMENT  
DENTISTRY PROGRAM



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ  
صَلَوَاتُ اللَّهِ عَلَى مُحَمَّدٍ وَآلِهِ وَسَلَامٌ

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# VISION AND MISSION



## Vision of ISNC

Leading private health professions education in GCC countries.



## Mission of ISNC

To make a significant contribution to advances in Saudi Arabian health care, through the provision of outstanding education, research and medical services in a motivating and technology enabled learning environment.



## Dentistry Program Mission

To graduate professional dentists with an aptitude to be innovative and life-long learners, through provision of knowledge, skills, ethical principles, and research abilities in a motivating learning environment.

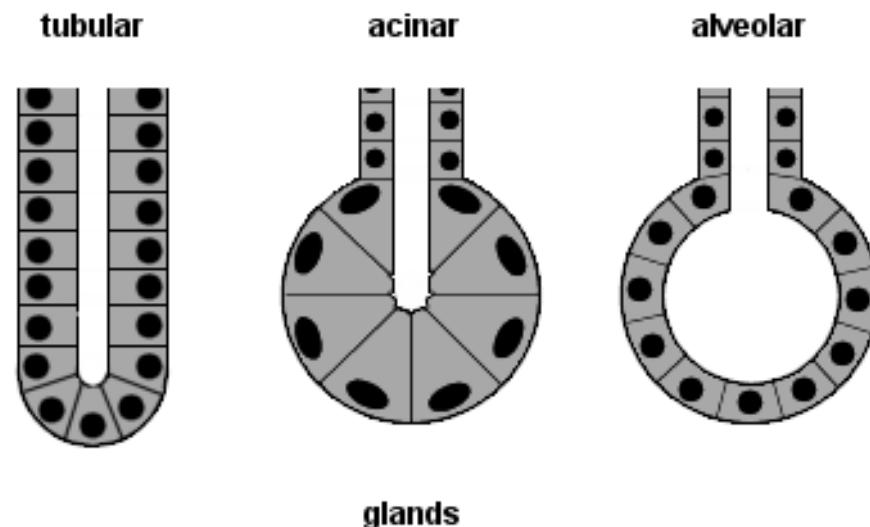
# What is a gland?

*Gland is an organ of secretion made up  
of specialized secretory cells derived  
from the surface epithelium on which it  
opens.*

# General Features

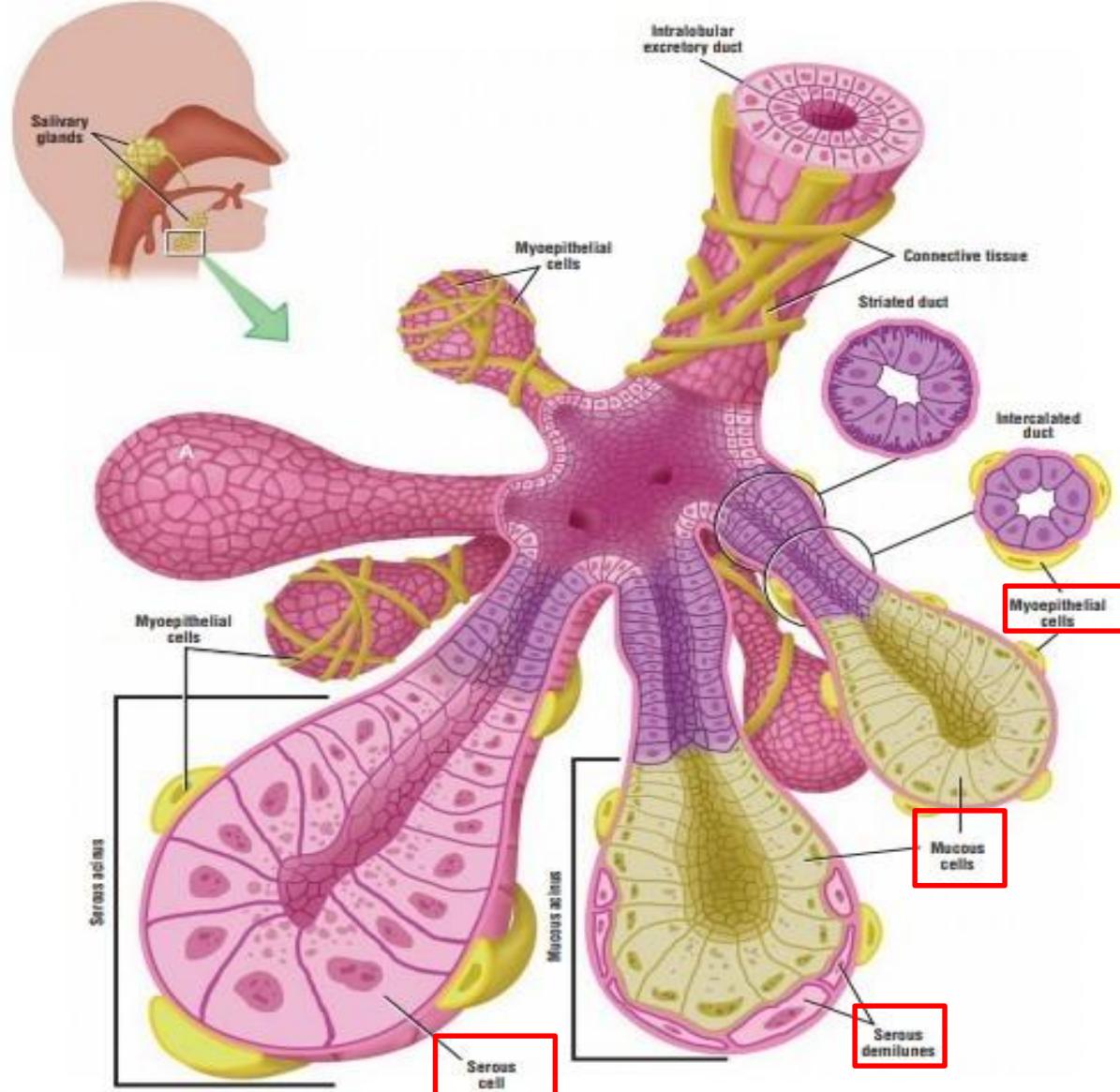
- Epithelial in origin
- Secretory cells form functional units called secretory end pieces which may be flask (Acinus) or cylindrical (Tubular) shaped

## Types of Secretory units



# General Features

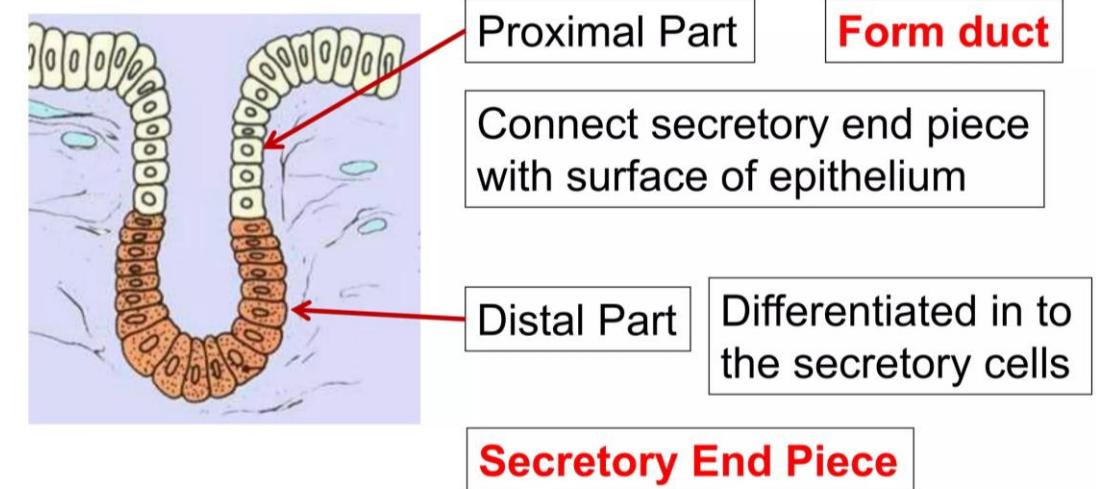
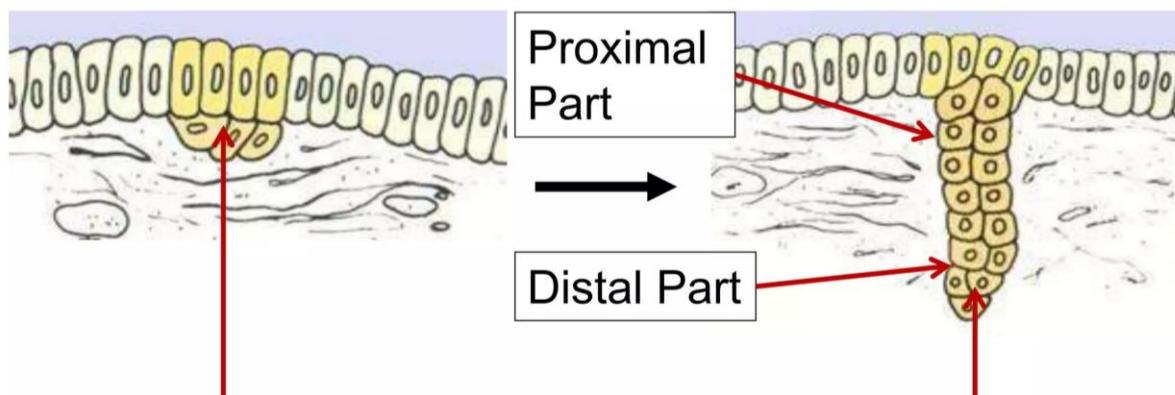
- Fluid secreted may be enzymes, hormones or mucus.
- Secretion is modulated by nervous and hormonal influences.
- Myoepithelial cells: star shaped, contractile, lie between the secretory cells and the basement membrane.
- Myoepithelial cells function to contract & expel the secretory products from different acini.



OVERVIEW FIGURE 11.2 ■ Salivary glands. The different types of acini (serous, mucous, and serous demilunes), different duct types (intercalated, striated, and intralobular), and myoepithelial cells of a salivary gland are illustrated.

# Development

- Develop as invagination of the epithelium into the underlying vascular connective tissue.
- Distal part forms glandular or Secretory end Piece (functionally an active portion).
- Proximal part → Excretory Duct → opens on the surface of the epithelium



1

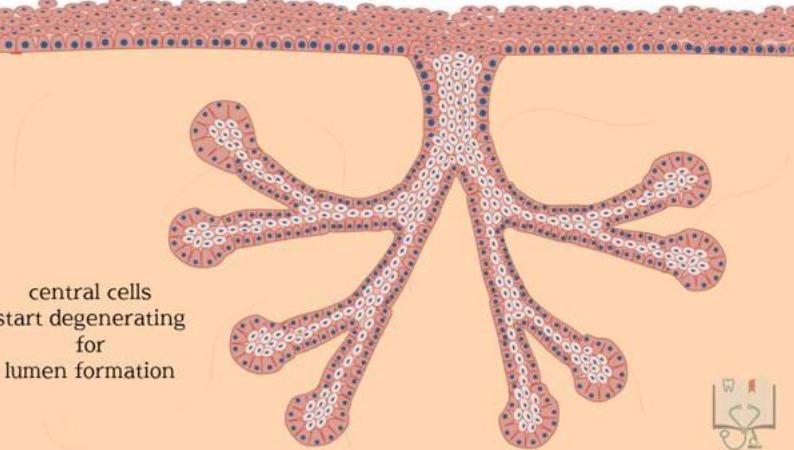
EPITHELIUM

ECTOMESENCHYME

2

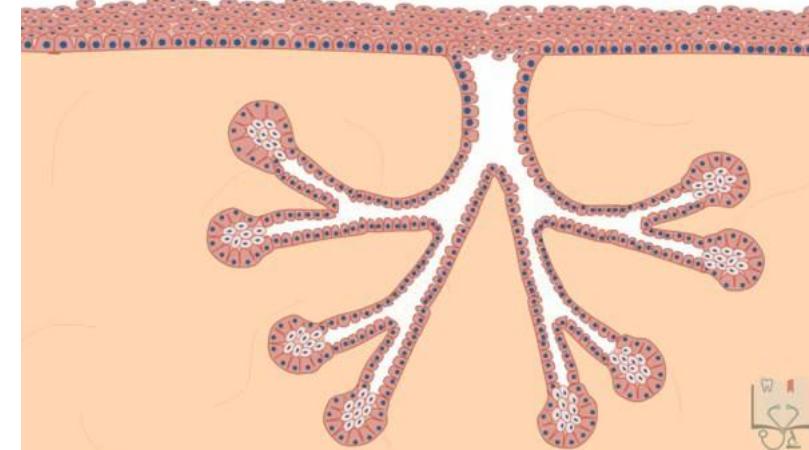
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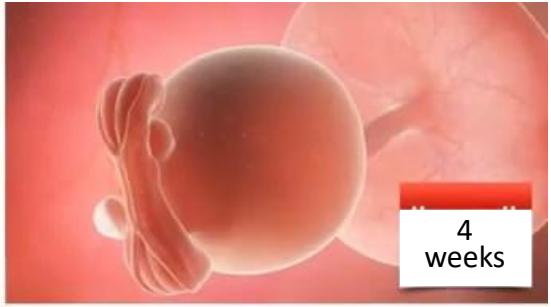
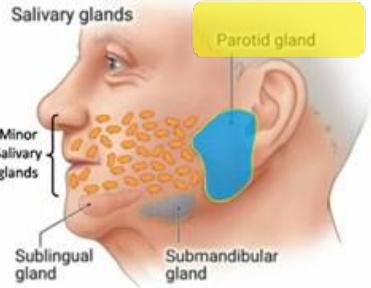


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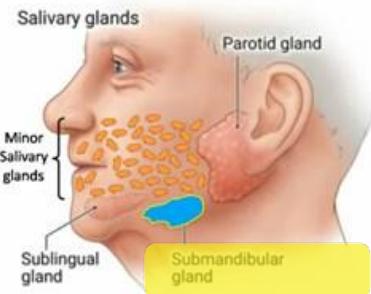


# Initiation of salivary gland development

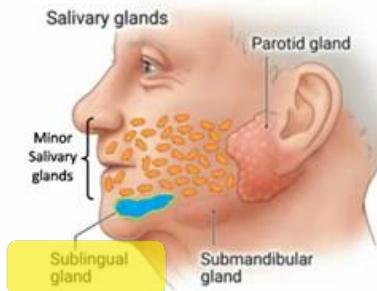


W C Q

# Initiation of salivary gland development



# Initiation of salivary gland development



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# Histology of Salivary Glands

# HISTOLOGY

Secretory End Piece/Acini

- Serous Acini

Dark color

- Mucous acini

Light color

- Serous Demilune

mixed

mucus



sems



# HISTOLOGY

Secretory End Piece/Acini

- Serous Acini

- Mucous acini

- Serous Demilune

Duct system

- Intercalated ducts

- Striated ducts

- Excretory ducts



# HISTOLOGY

Secretory End Piece/Acini

- Serous Acini

- Mucous acini

- Serous Demilune

Duct system

- Intercalated ducts

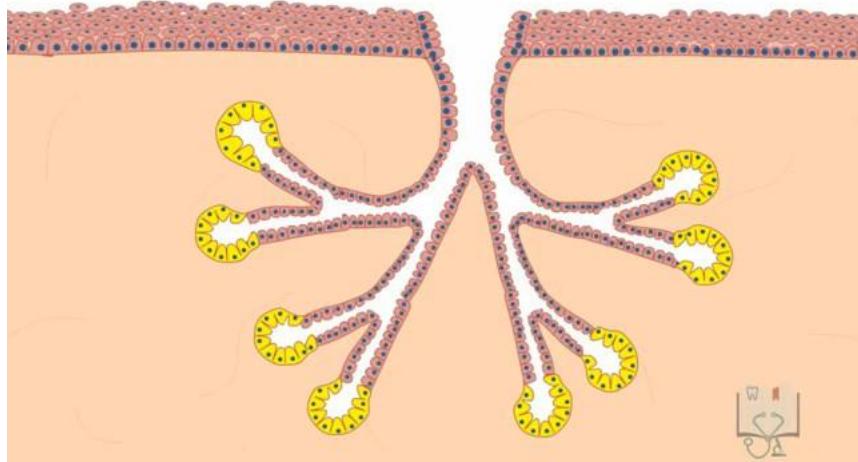
- Striated ducts

- Excretory ducts

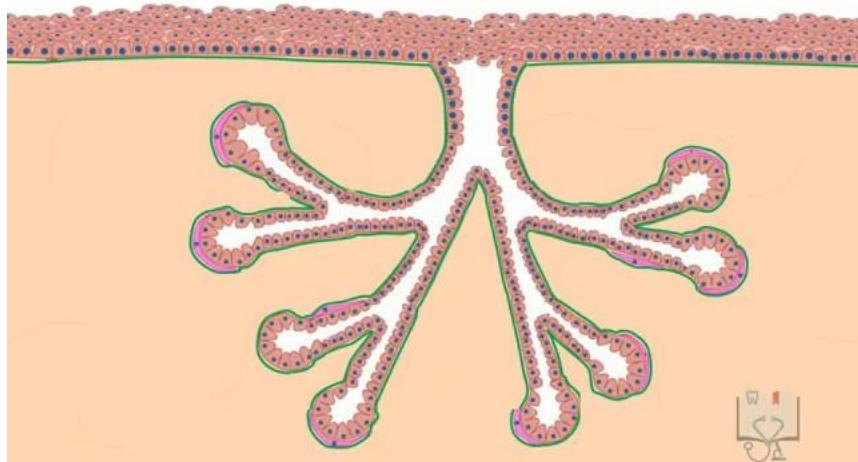
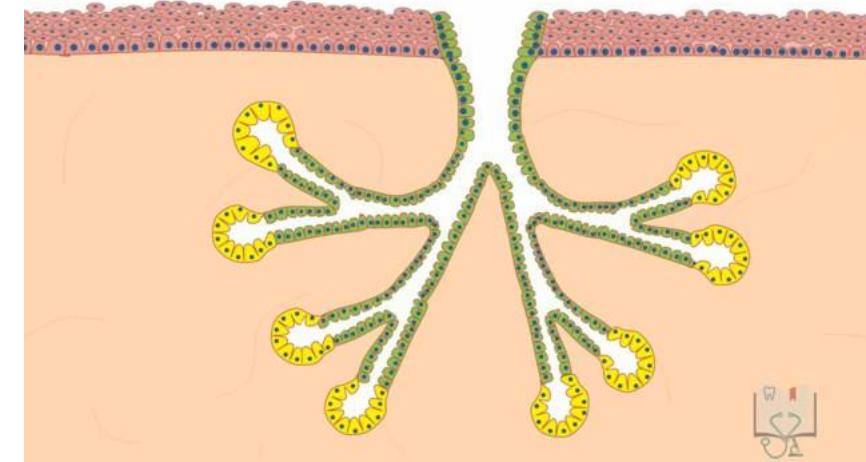
Myoepithelial cells



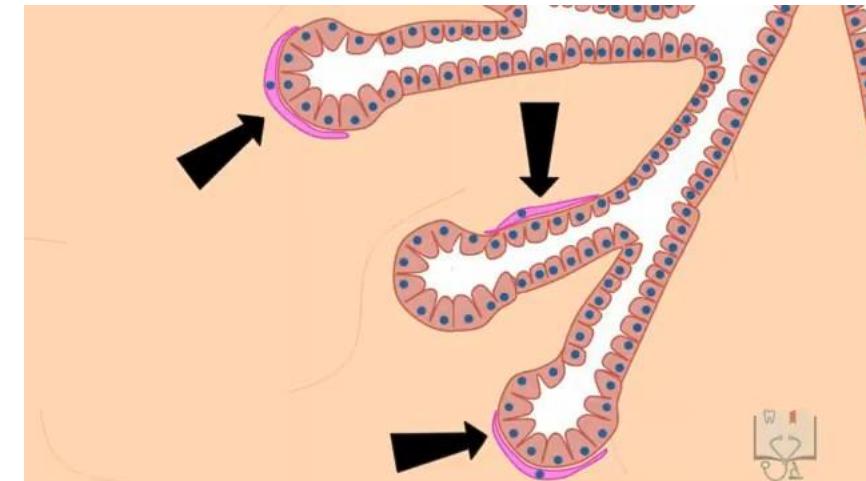
# Acini



# Ducts



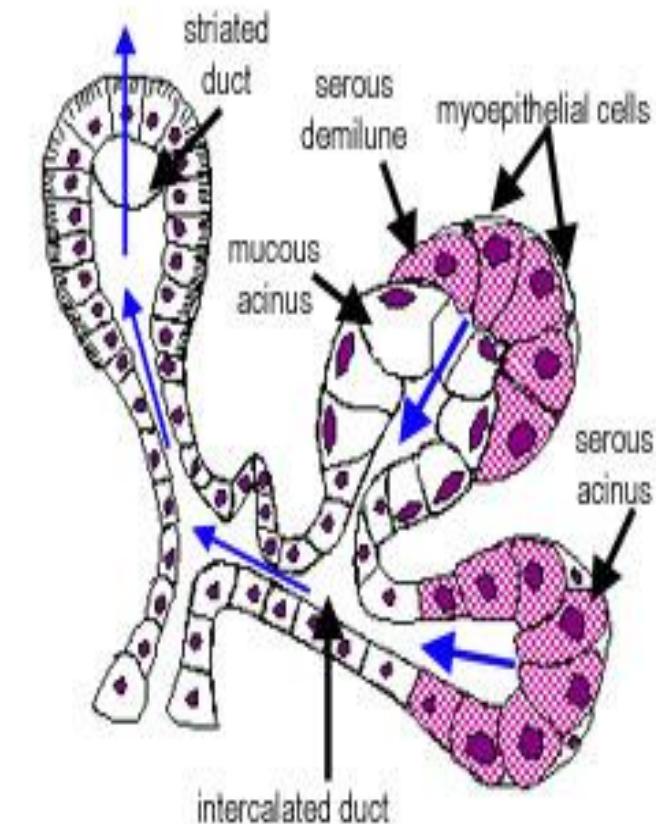
# Basement membrane



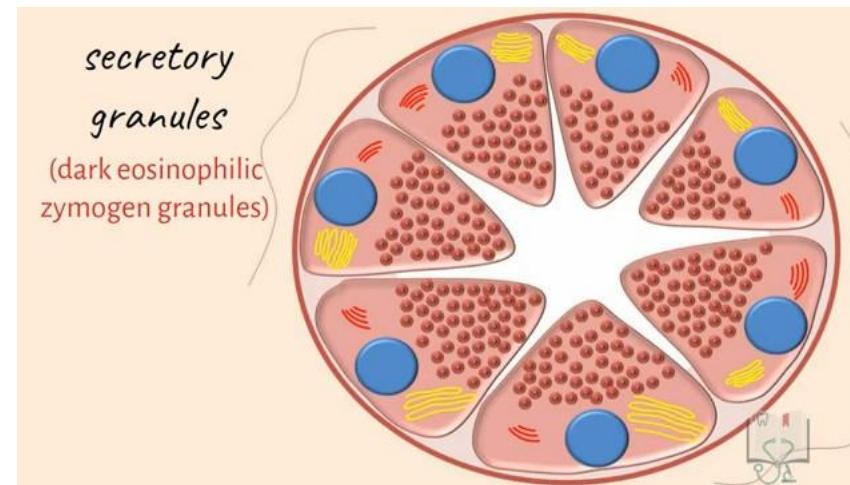
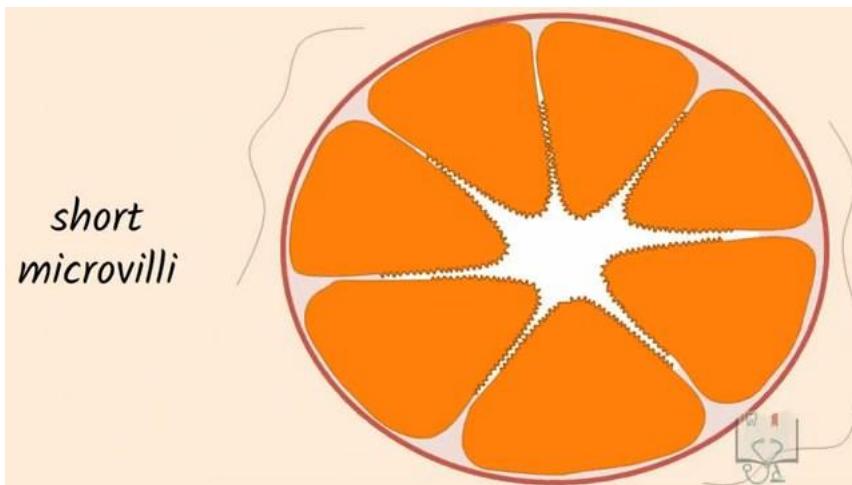
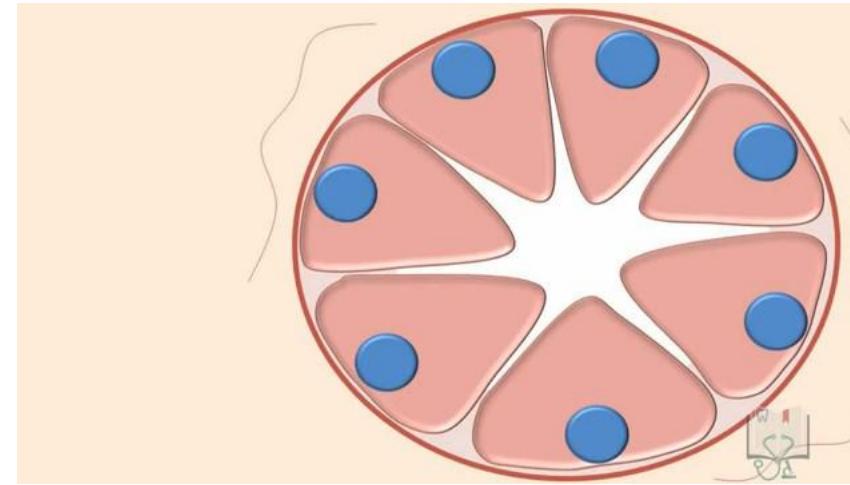
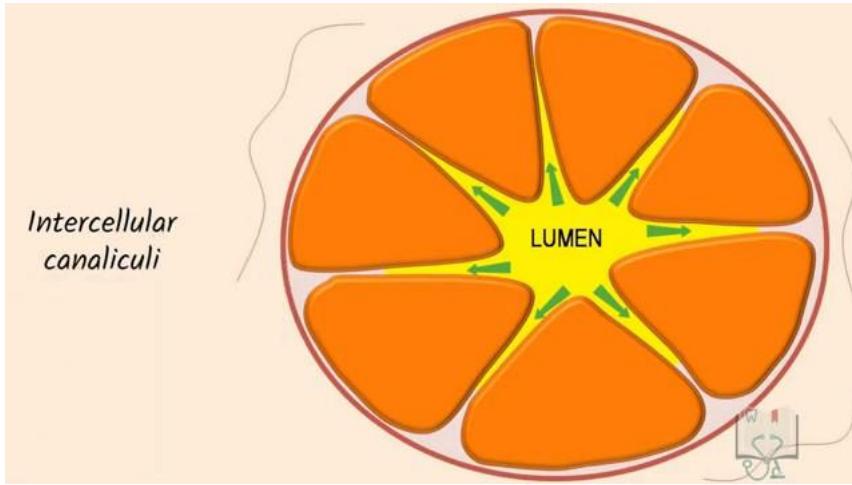
# Myoepithelial cells

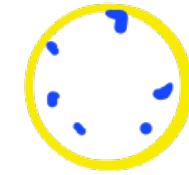
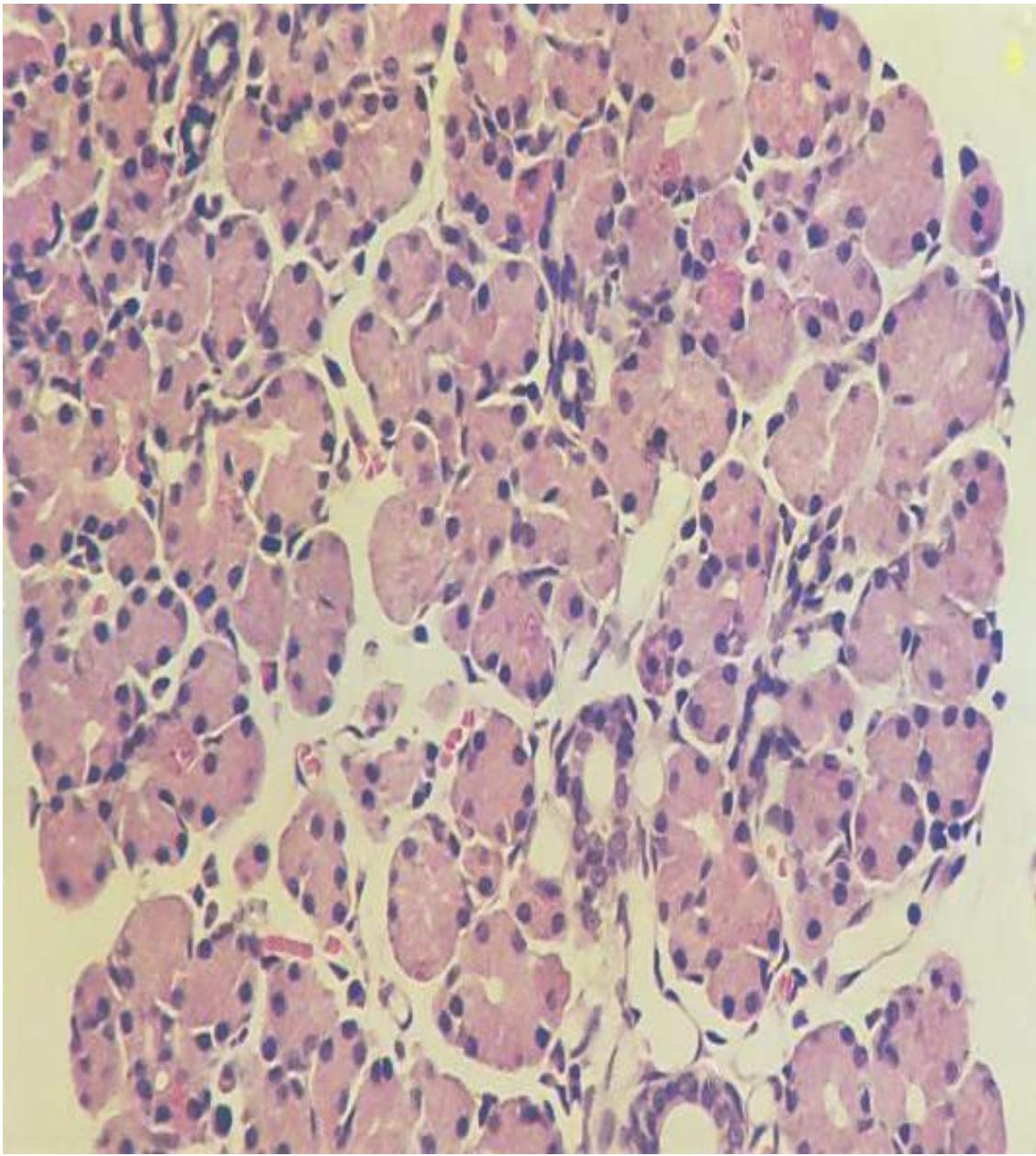
# SECRETORY UNITS (SALIVARY ACINI)

- Acinus is a group of cells surrounding a lumen
- Cells lie on a basement membrane BUT separated from it by **basket cells**.
- There are three types of acini
  - Serous acinus
  - Mucous acinus
  - Mucoserous acinus



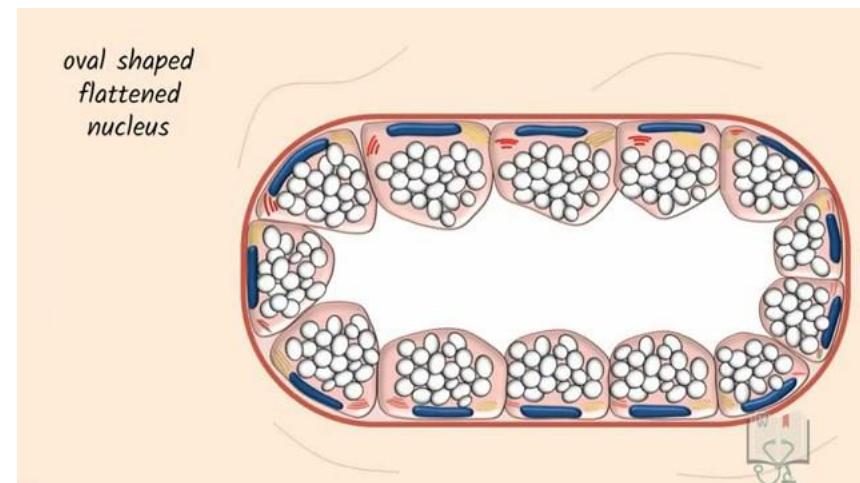
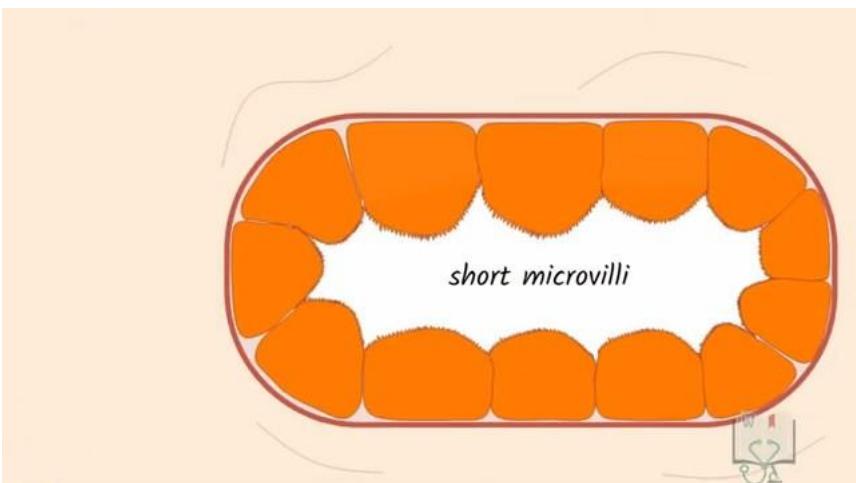
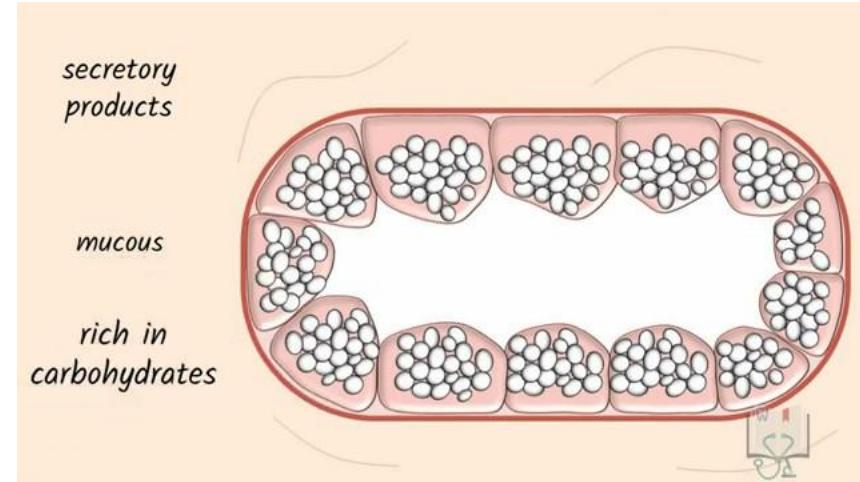
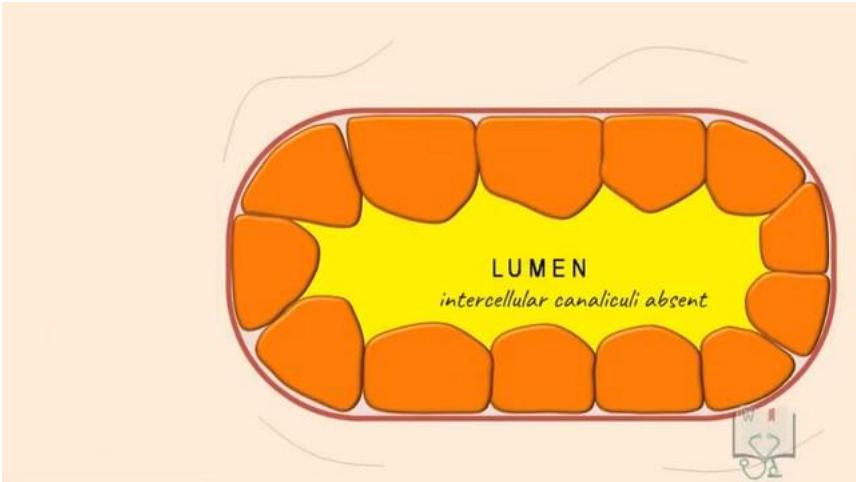
# Serous Acini

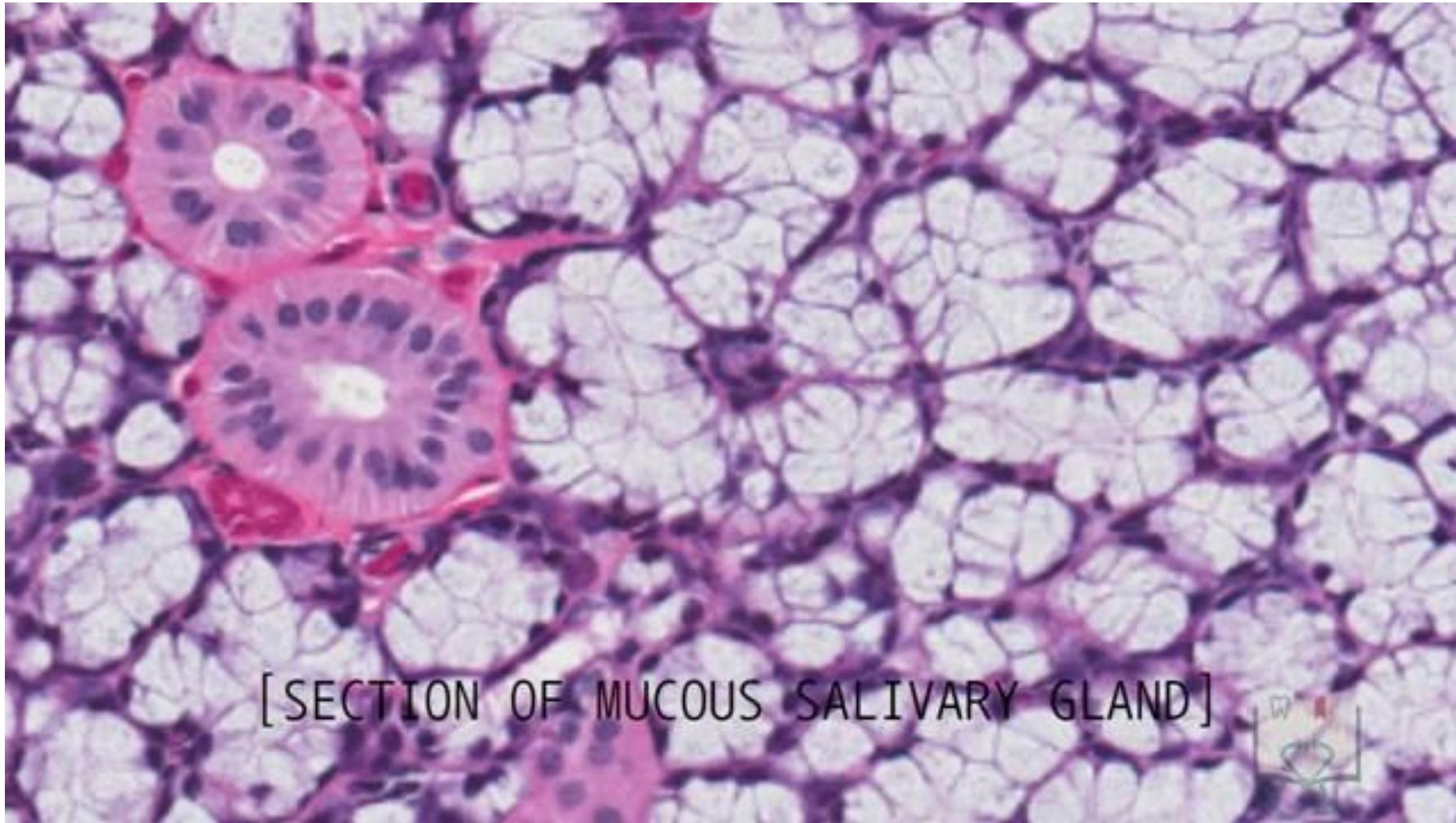




**Serous acini**

# Mucous Acini

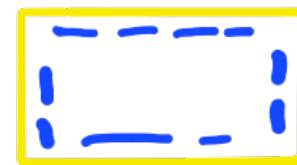


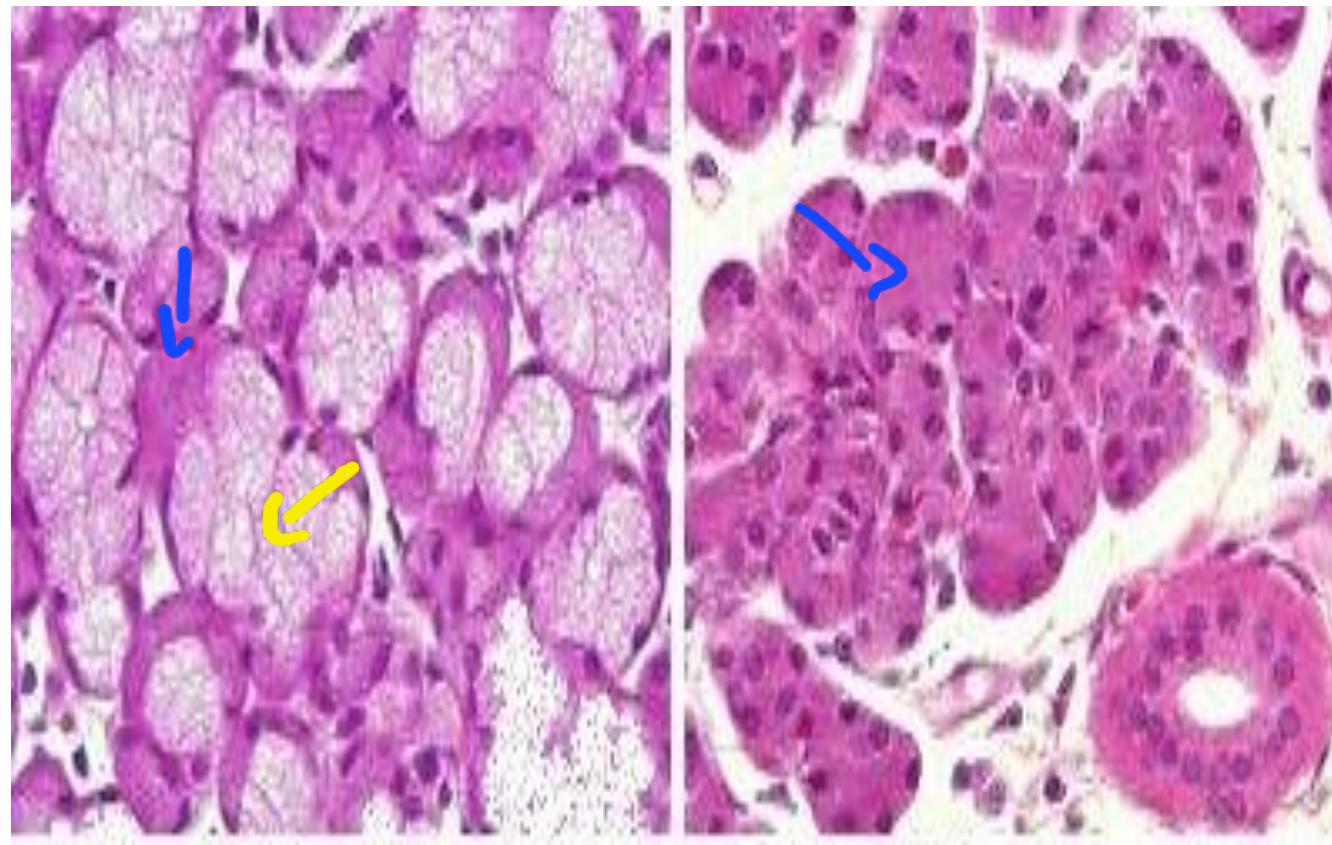


[SECTION OF MUCOUS SALIVARY GLAND]



mucous acini





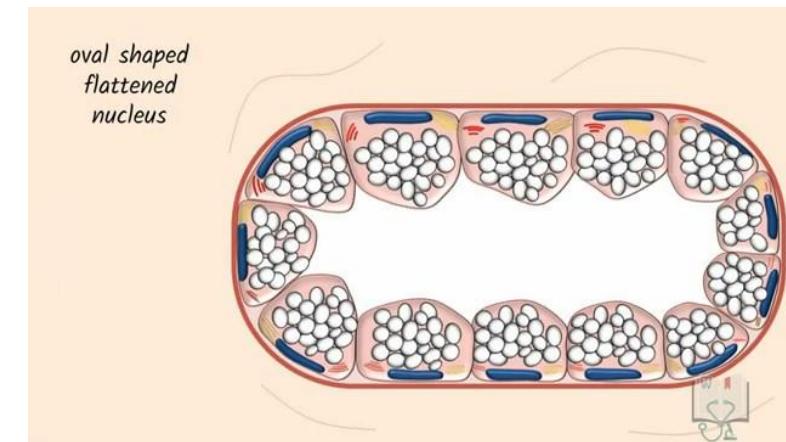
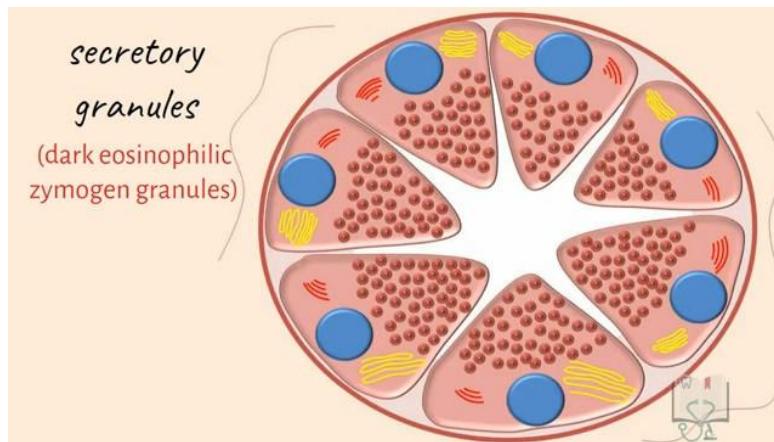
Mandibular gland (mixed)



Parotid gland (serous)



Serous acinus	Mucous acinous
Small diameter & narrow lumen	Large diameter & wide lumen
Deeply stained	Paler & lightly stained
Cells are pyramidal	Cells are irregularly cuboid
Nuclei are rounded & nearer to centre	Flattened & basal in position

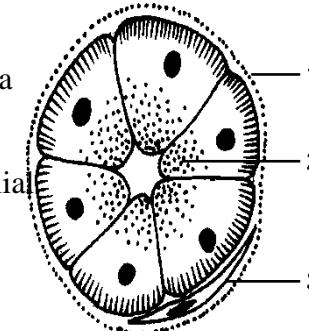


**DIFFERENCES  
BETWEEN SEROUS  
& MUCOUS ACINI**

*Diagram*

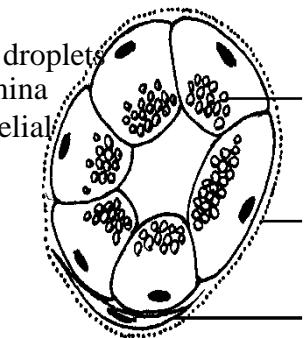
**Serous Acinus**

1. Basal lamina
- 2.Zymogen granules
3. Myo epithelial cell



**Mucous Acinus**

1. Mucigen droplets
2. Basal lamina
3. Myoepithelial cell



**Consistency for secretion**

**Thin Watery**

**Thick viscous**

**Shape and position of nucleus**

**Round, central**

**Flat, peripheral**

**Size of lumen**

**Small**

**Large**

**Staining reaction with H & E**

**Deeply stained**

**Lightly stained**

**Example**

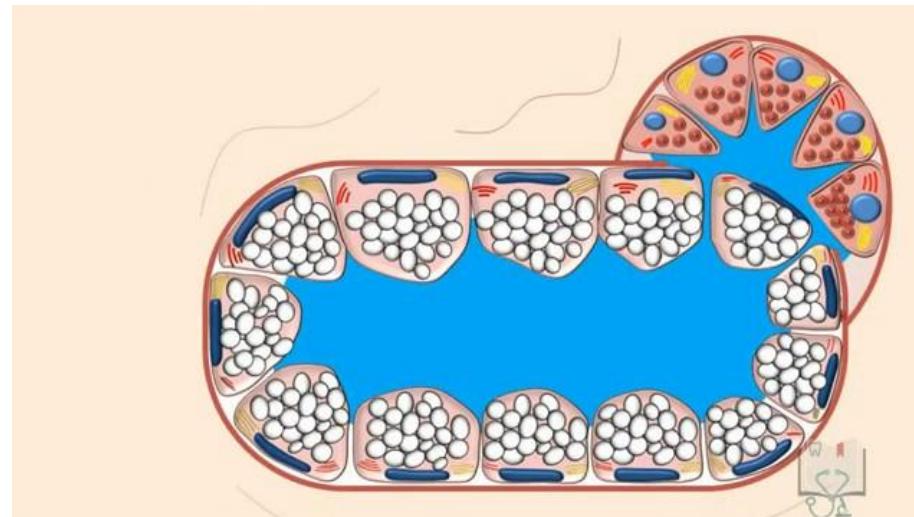
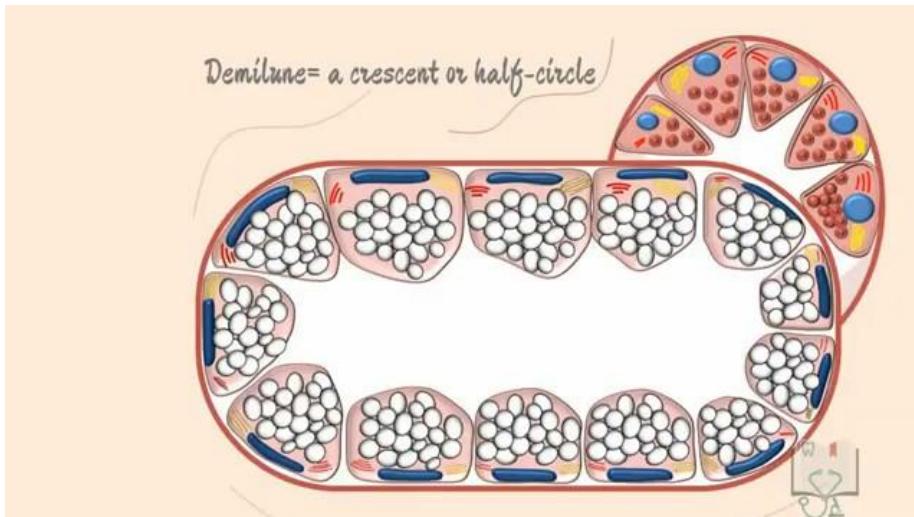
**Parotid**

**Sublingual**

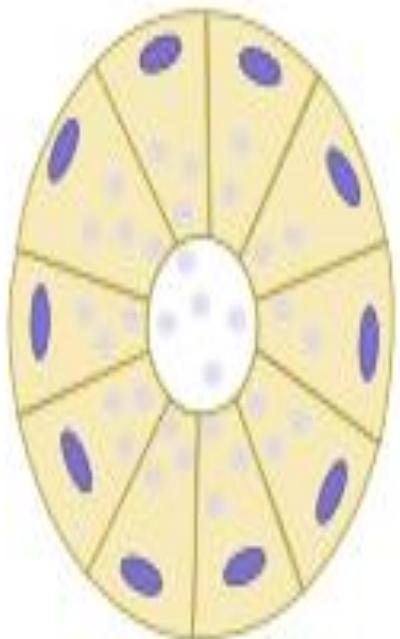
# Serous Demilune

(serous acini + mucous acini)

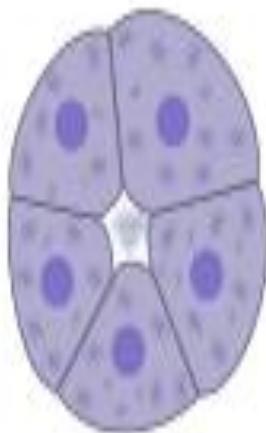
- Mucous acinus which is capped by serous cells forming a serous demilune
- Secretion of demilune passes to the lumen through canaliculi between the mucous cells.



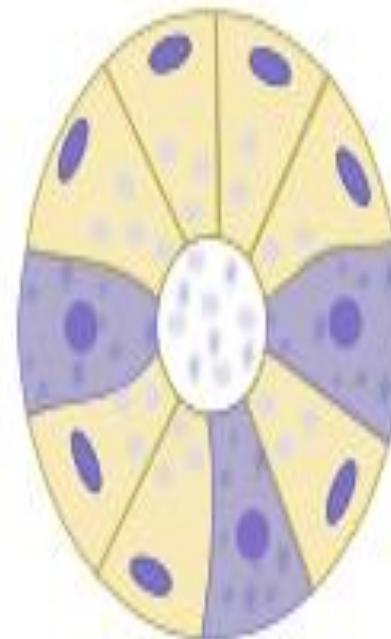
Mucous



Serous



Mixed



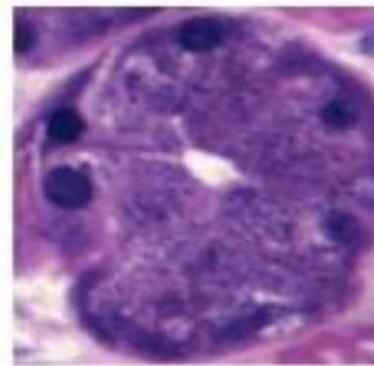
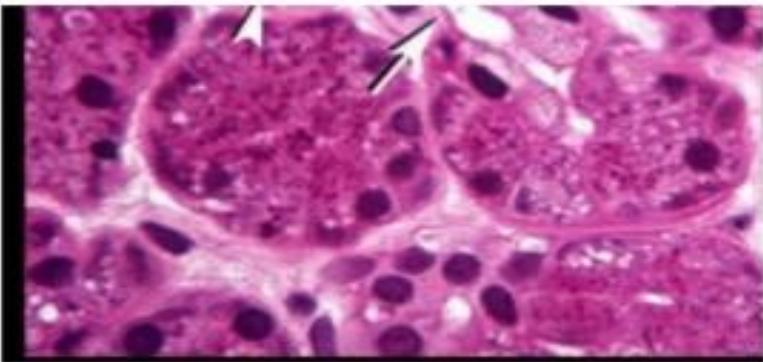
Artifact



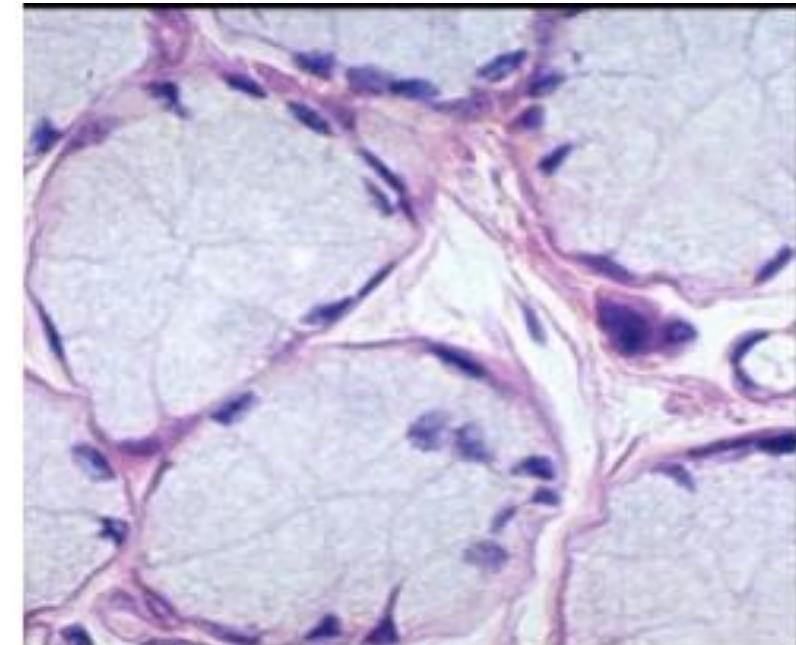
Mixed

## Types of Acini in Salivary Glands

**1) Serous**



**2) Mucous**



**3) Mucoserosus**



**Serous demilune**

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# Duct System

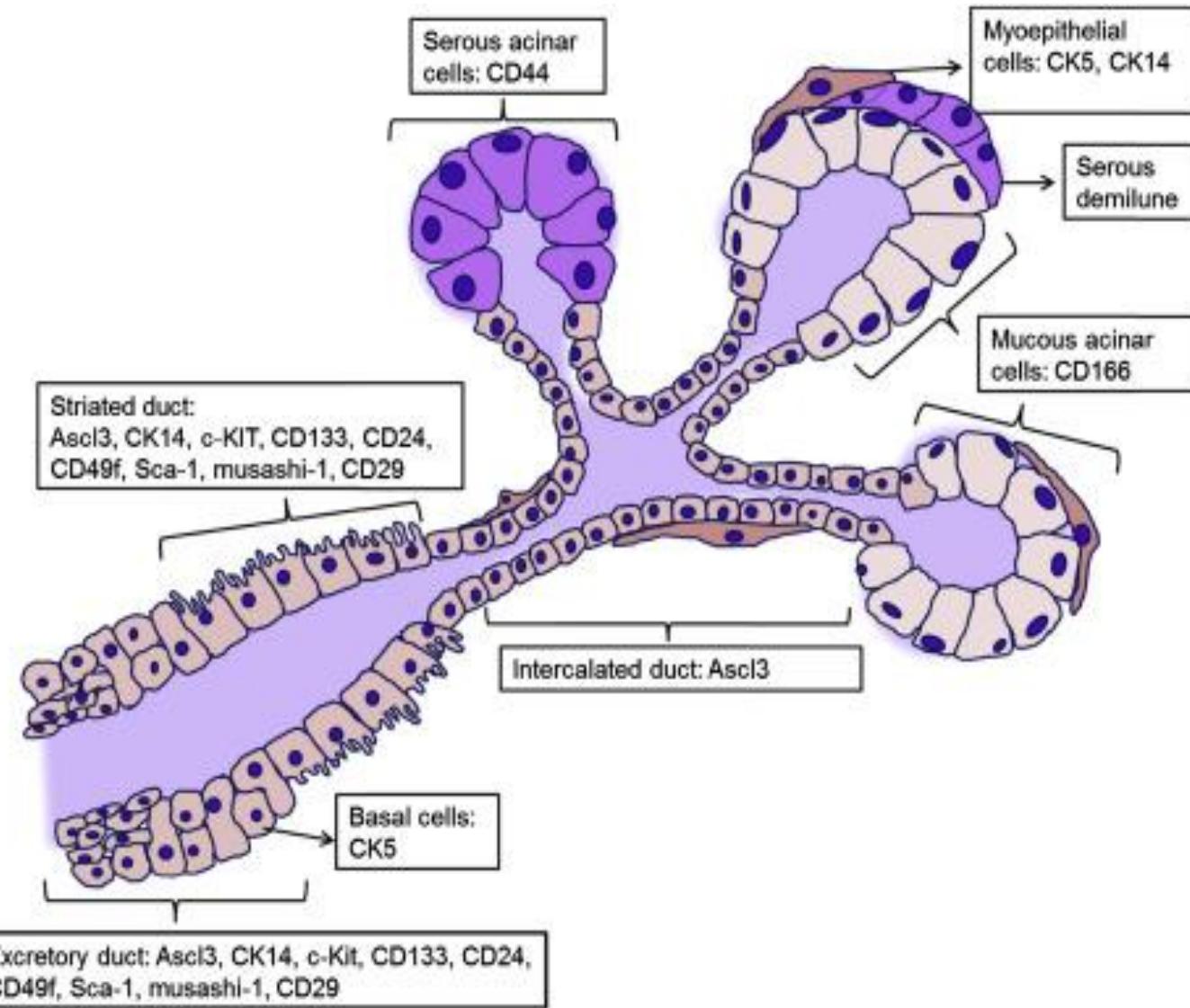
**1) Intercalated ducts:**  
Simple cubical epithelium.

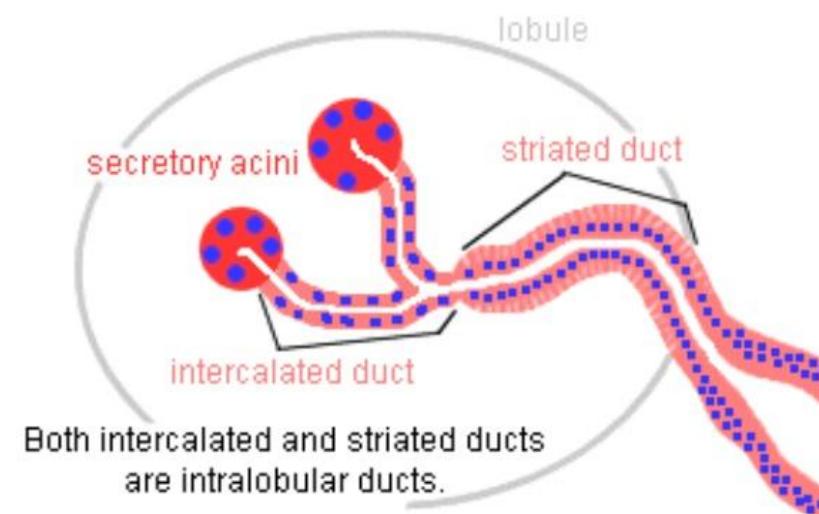
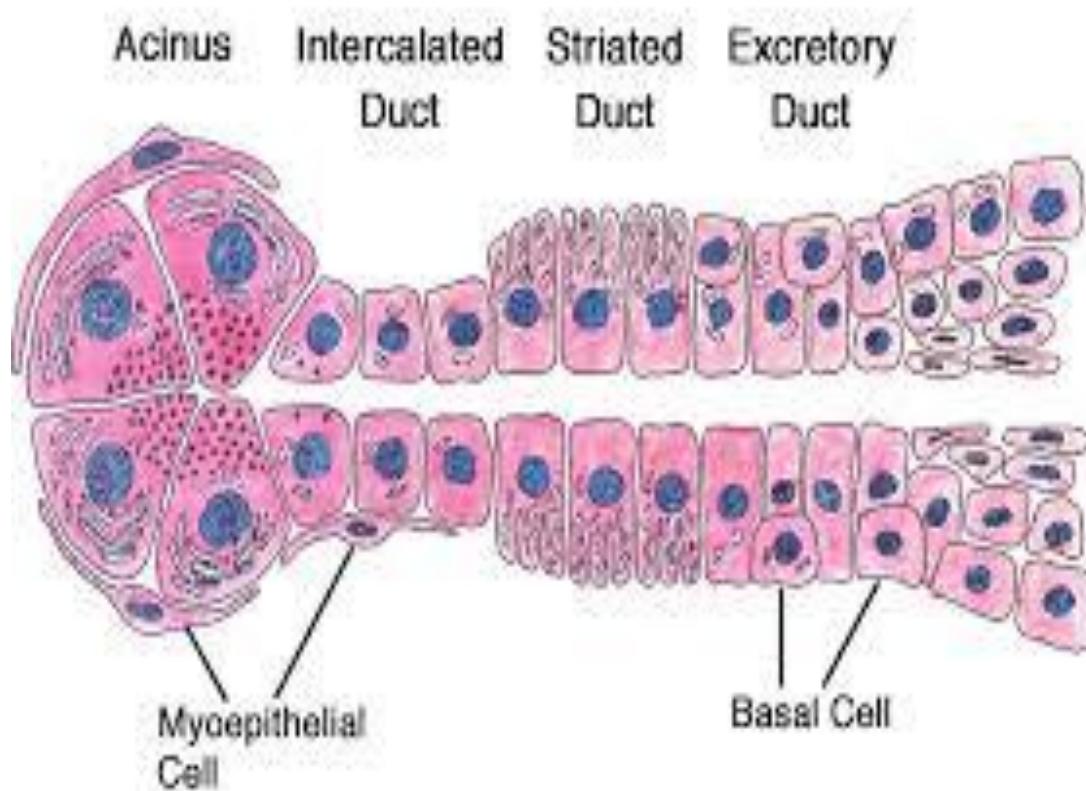
**2) Striated  
(Intralobular) ducts:**  
Cuboidal or low columnar  
cells with rounded nuclei.

**3) Interlobular  
(Excretory) ducts:**  
Columnar cells.

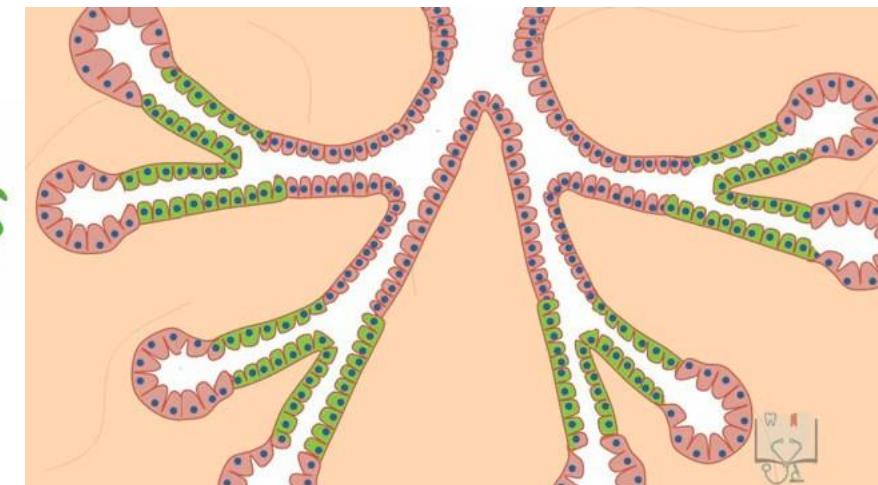
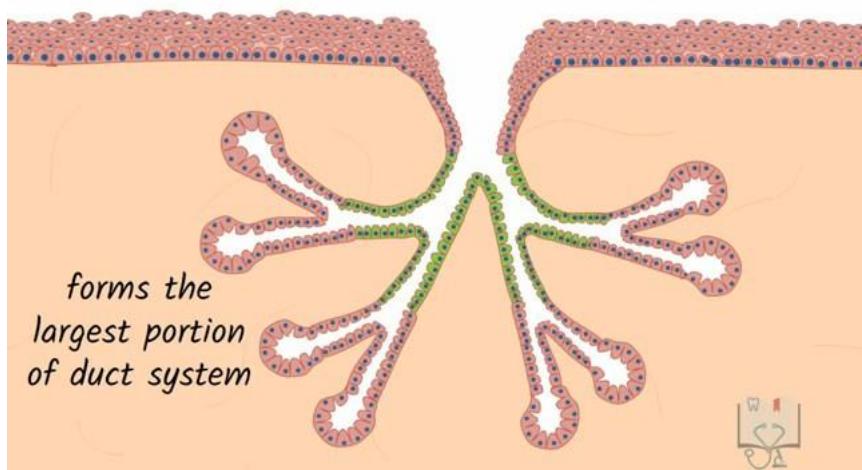
**4) Interlobar ducts:**  
Pseudostratified  
columnar.

**5) Main Duct:** Stratified Columnar  
then stratified squamous at its end.



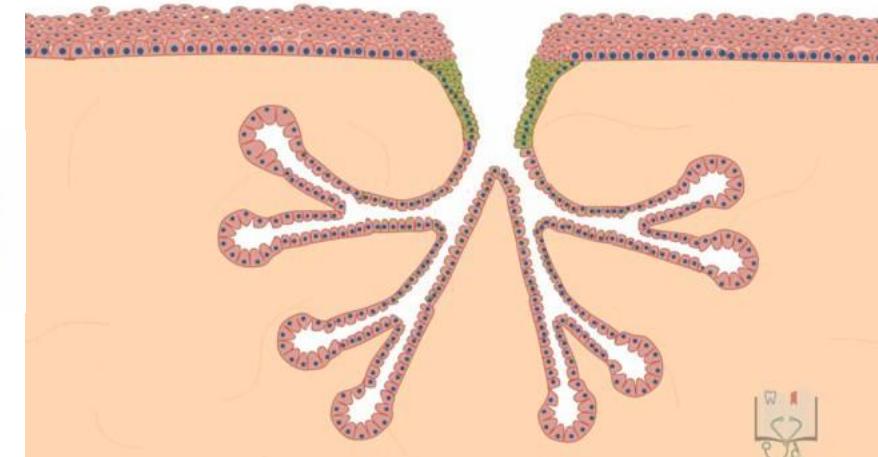


## Intercalated ducts



## Striated ducts

## Excretory duct



# Myoepithelial cells

## BASKET CELLS

- Lie between the secretory cells of the acini and the BM.
- Contain actin & myosin so called myoepithelial cells
- Their contraction squeez the secretion out into the duct system

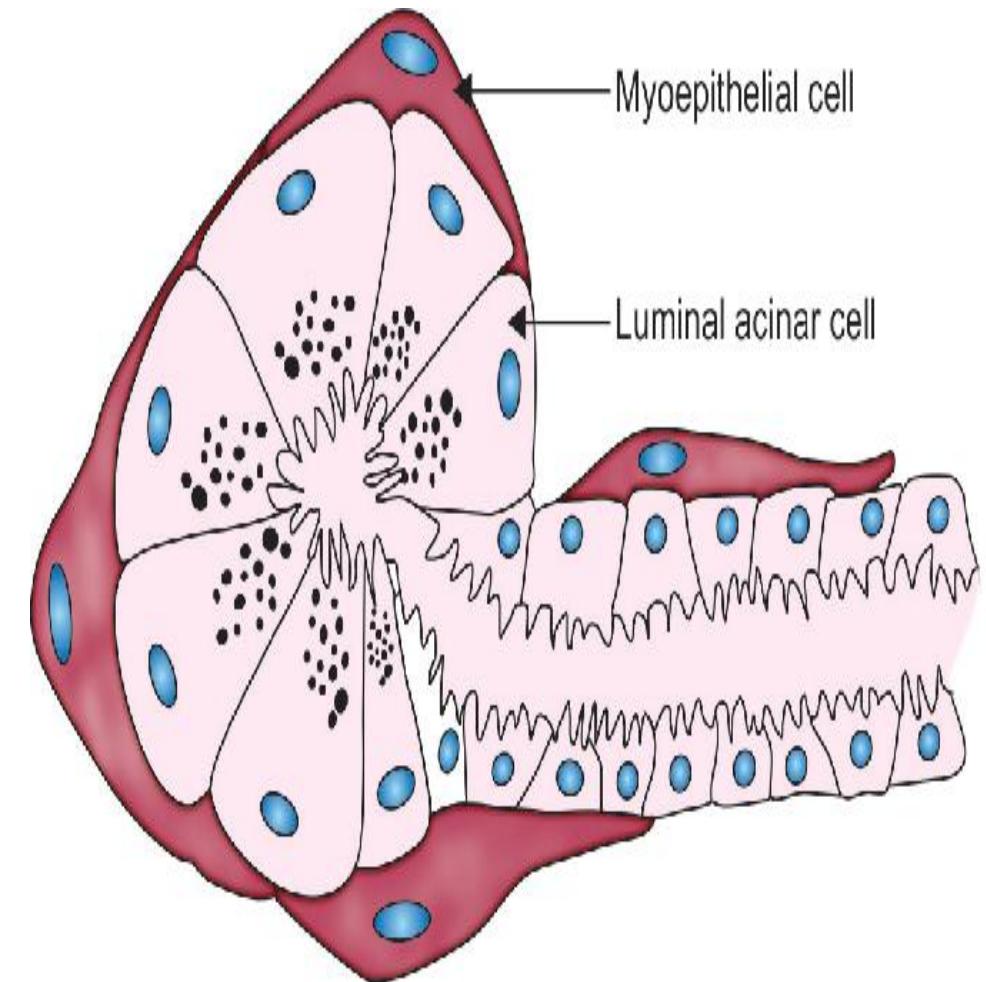
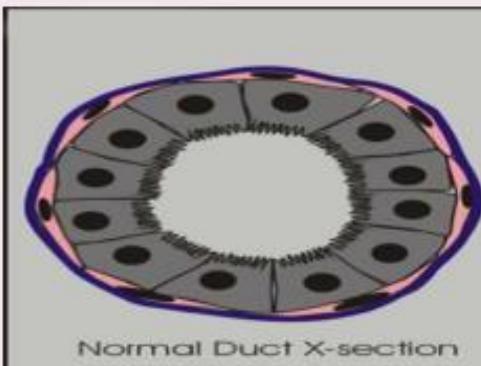
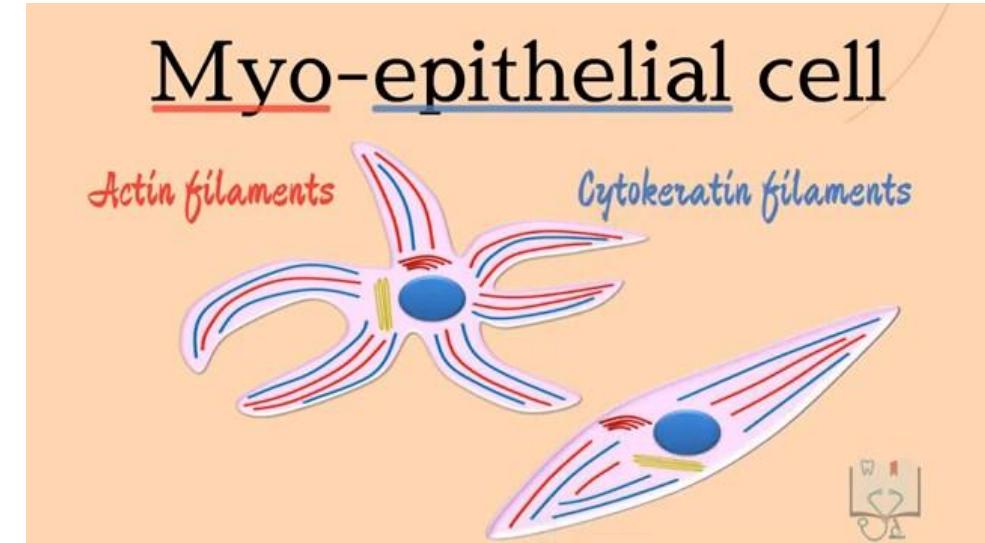
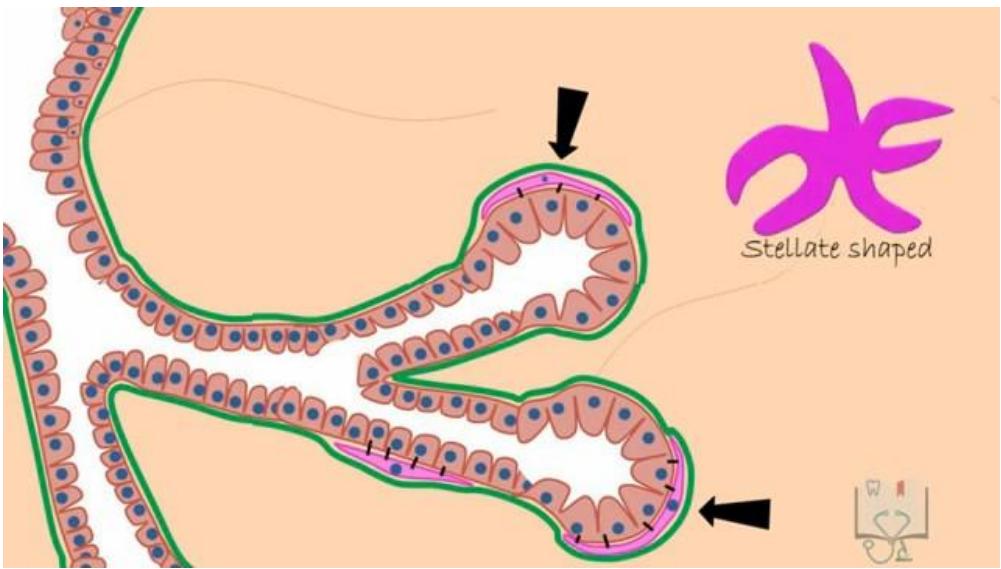
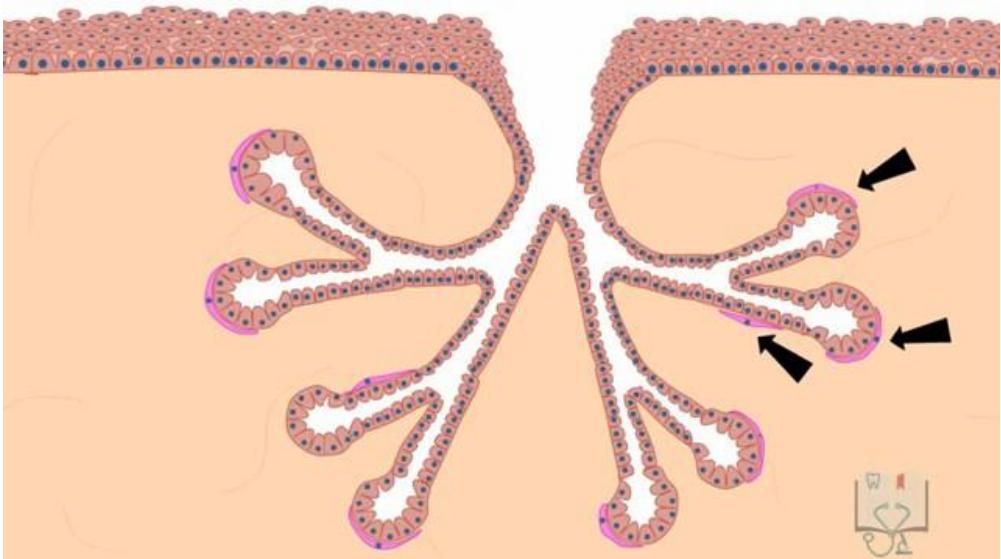
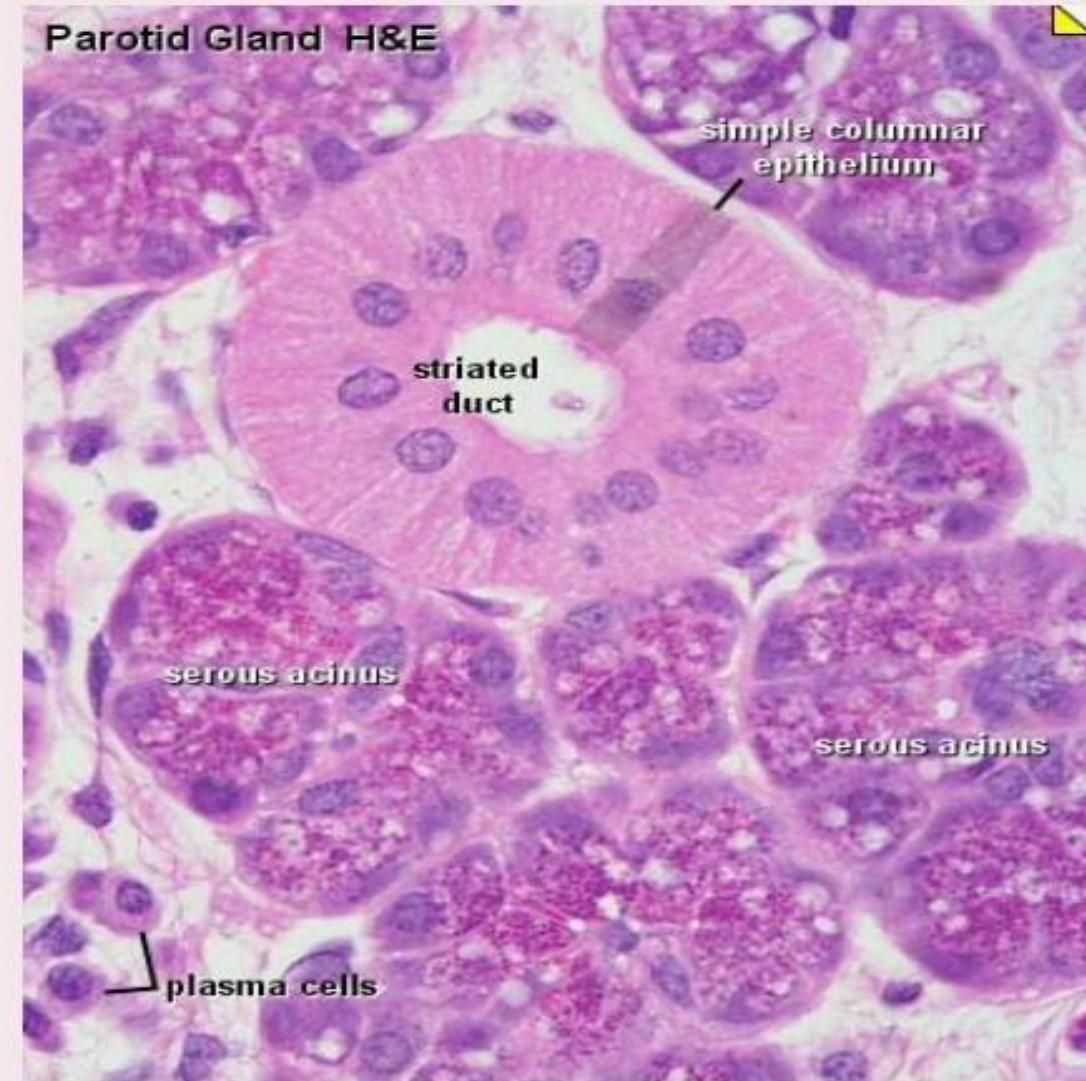


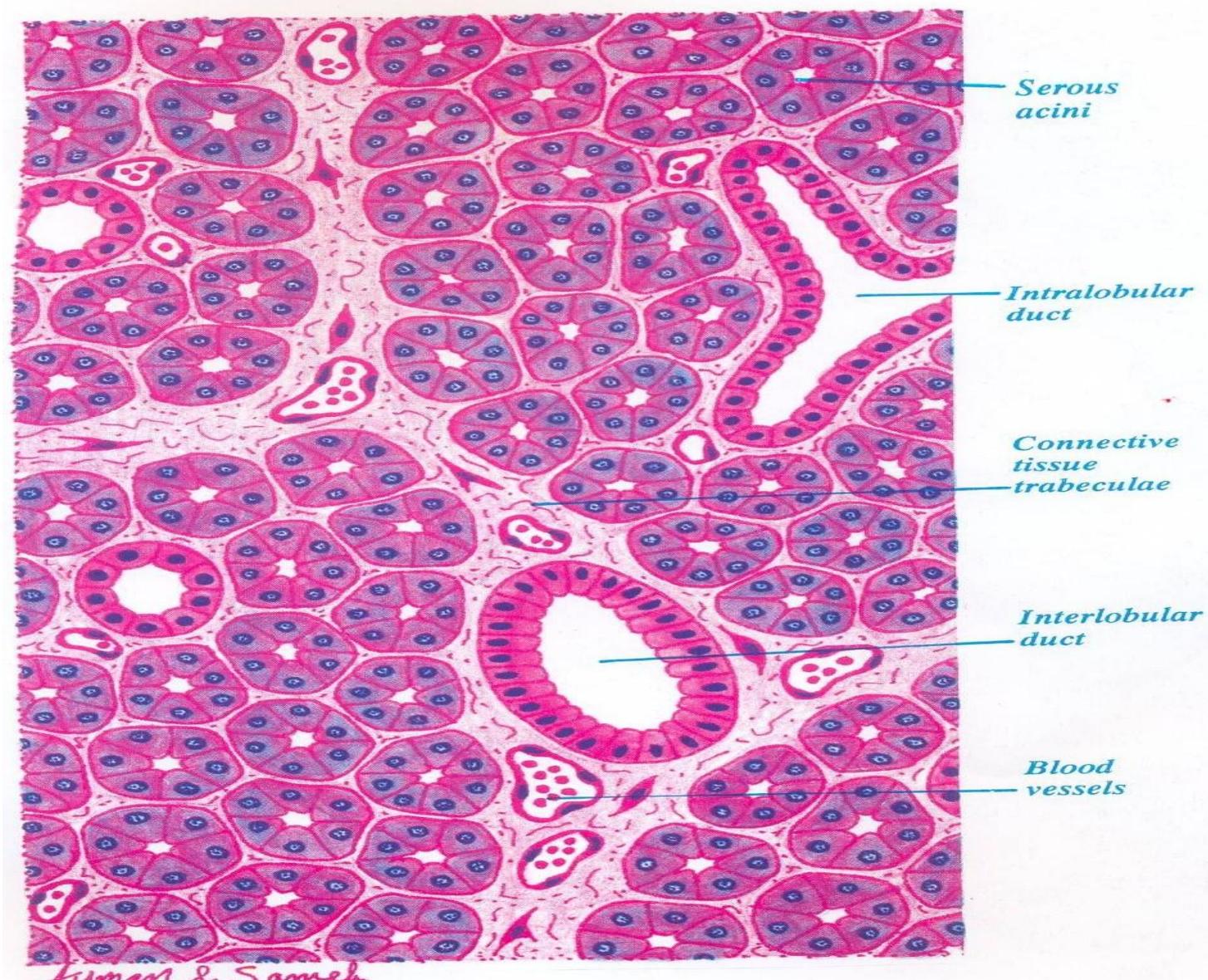
Fig. 1: Myoepithelial cell



# PAROTID GLANDS

- Capsule & septa are thick, fibrous & well developed
- Fat cells accumulate around the capsule
- Acini are purely serous
- Intralobular ducts are very prominent & extensive

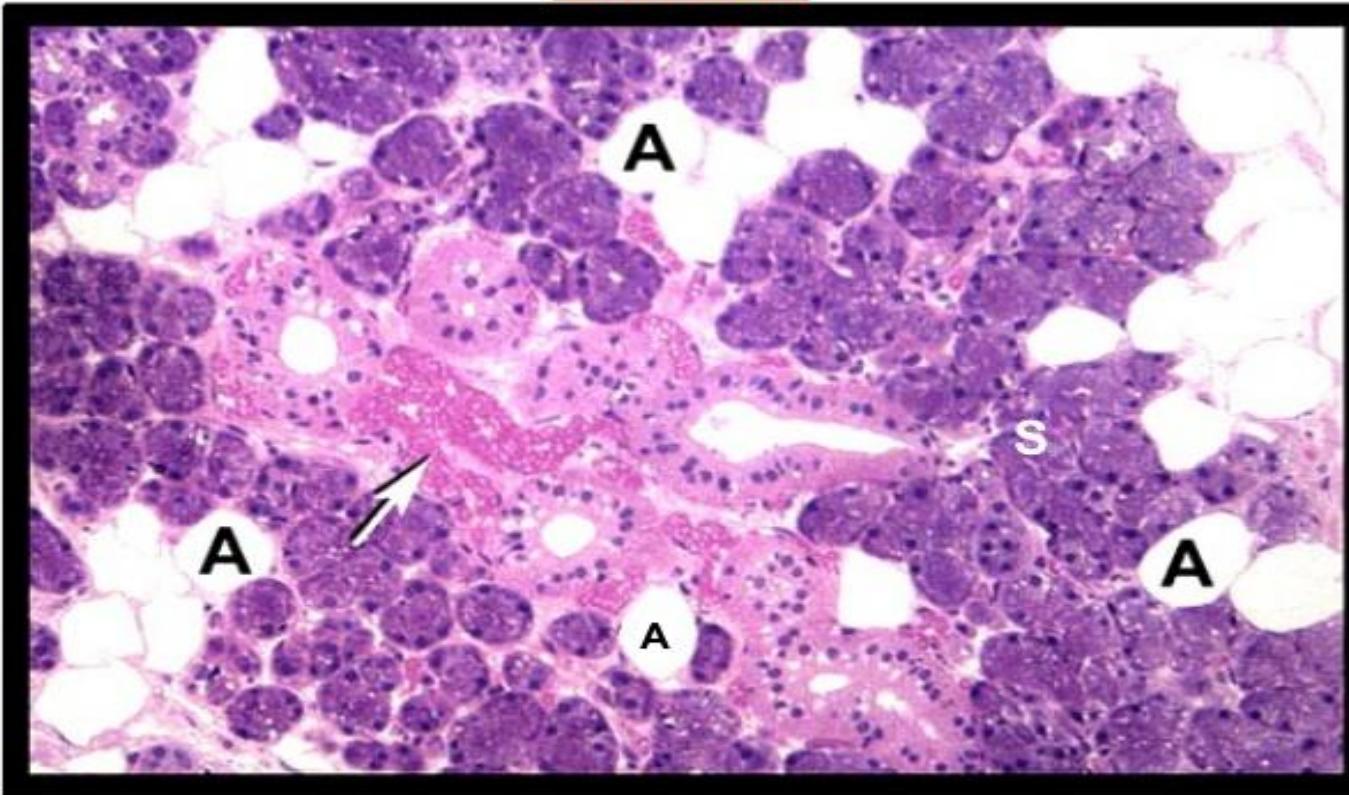




*Section of Parotid Gland*

acini). (Fig. 1-2

## Parotid

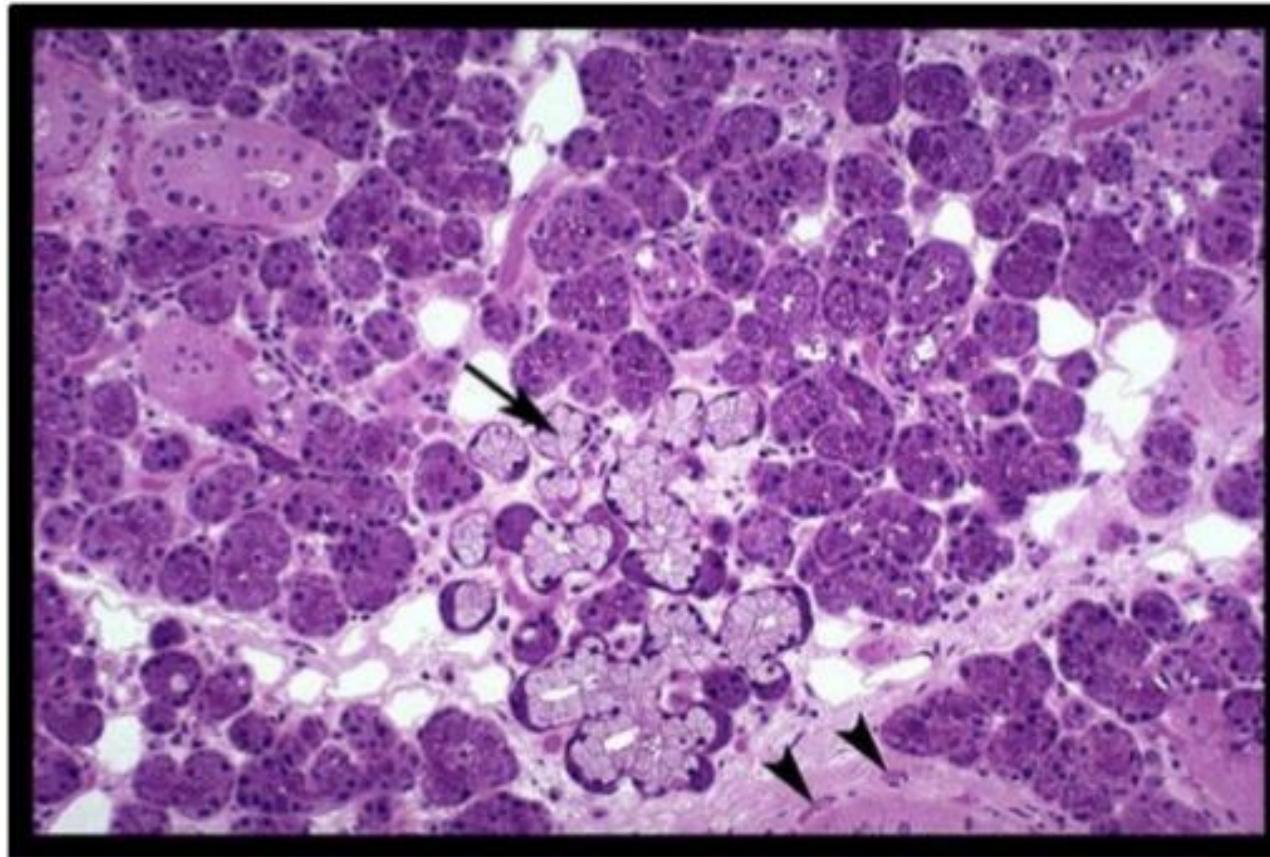


Stroma is well developed

Trabeculae (Septa) are thick & rich in adipocytes (A).

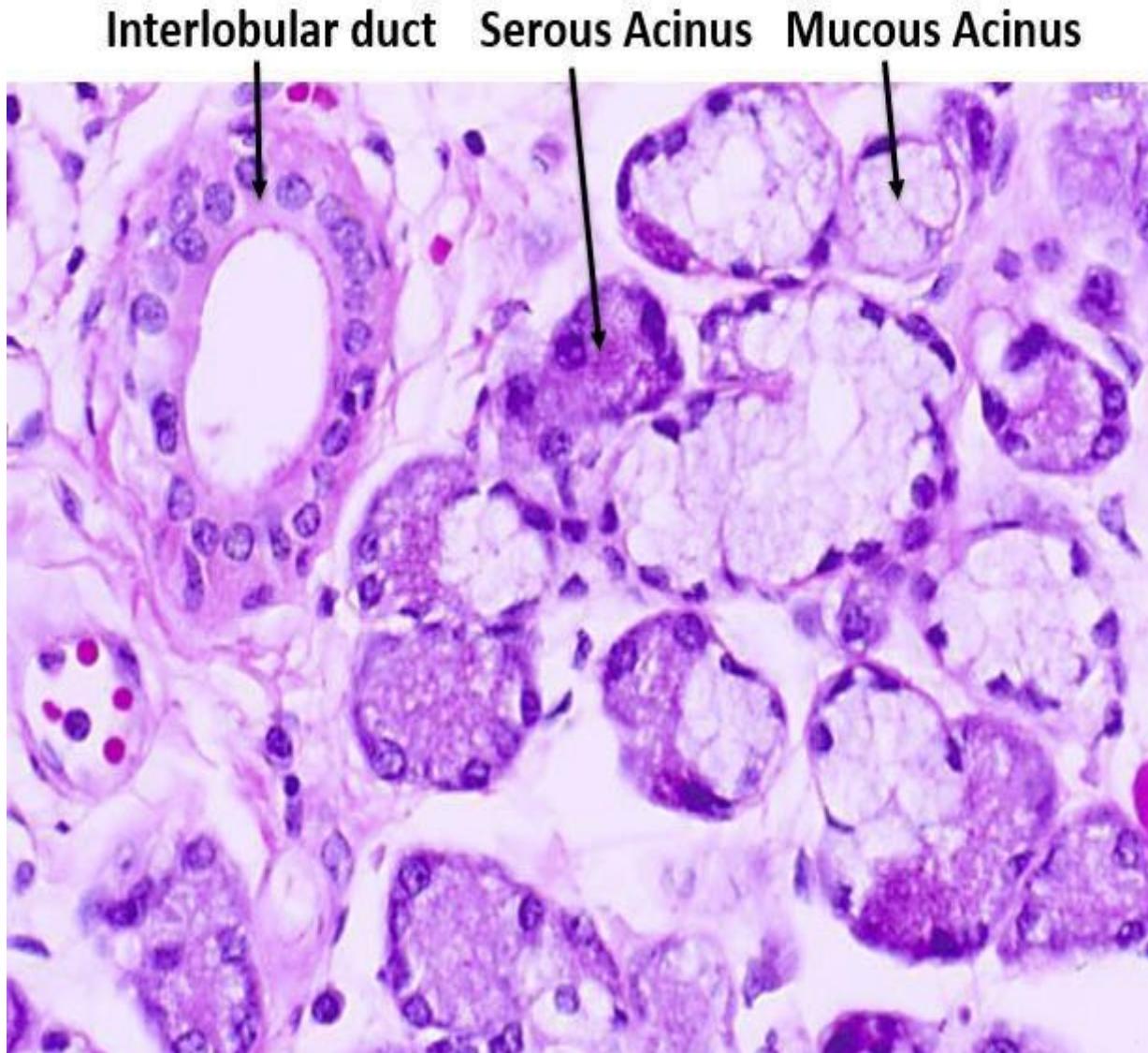
Parenchyma: Mostly serous acini (S).

## Submandibular Gland: “*Human*”

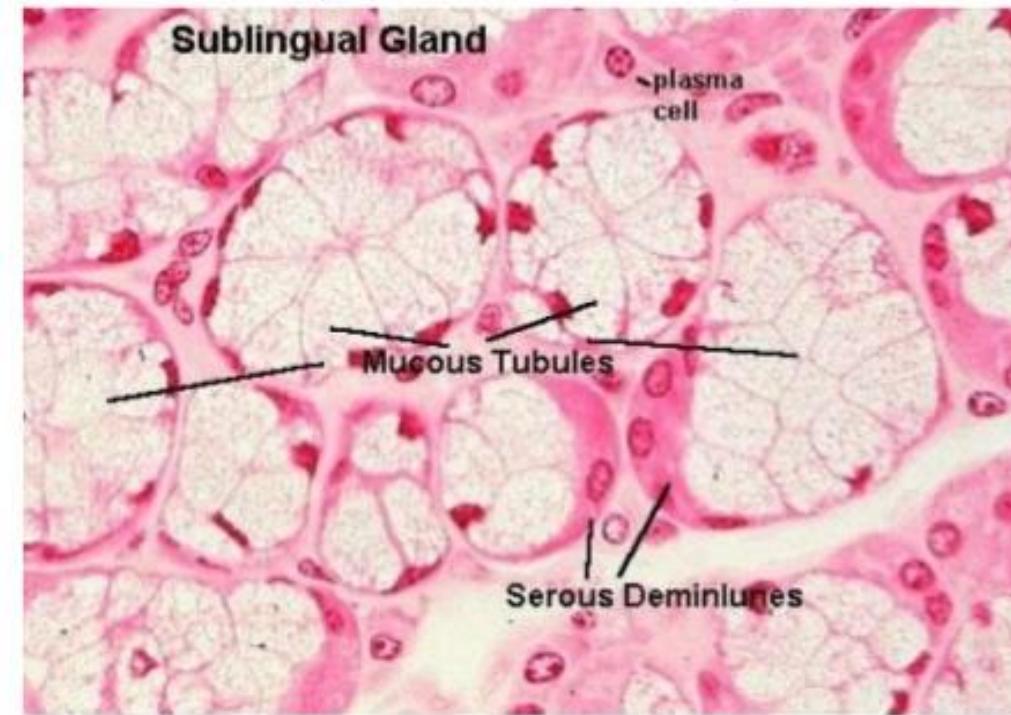
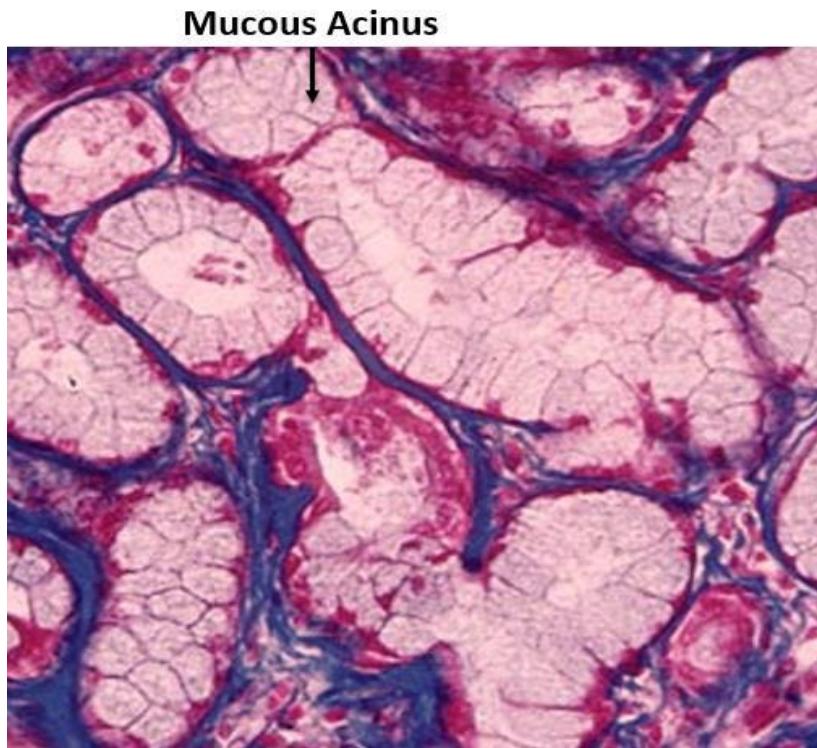


Seromucous Gland: In humans, 90% of its acini are serous & 10% are mucous and mucoserous.

## *Sub Mandibular Gland- mixed gland*



# Sublingual Salivary Gland

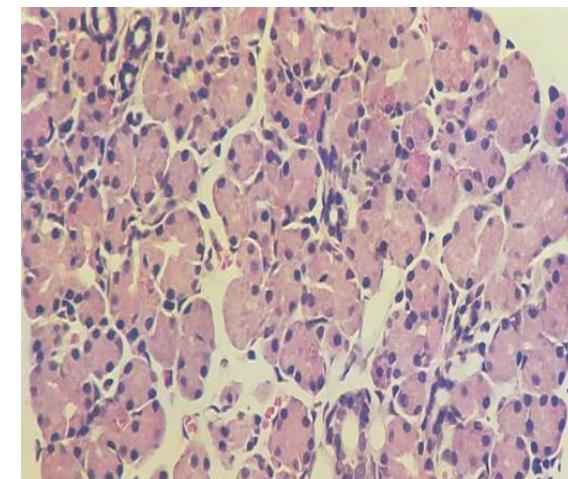


Mucous acini predominate.  
Some mucoserosous acini.  
NO pure serous acini.

# Histology of Salivary Glands

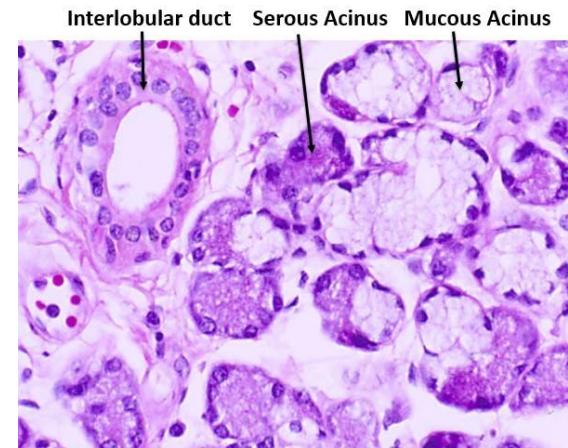
## Parotid Gland

- Presence of Serous acini
- Large number of ducts
- Infiltration of adipocytes



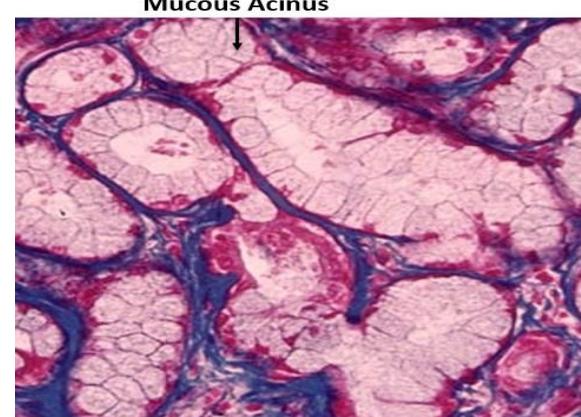
## Submandibular Gland

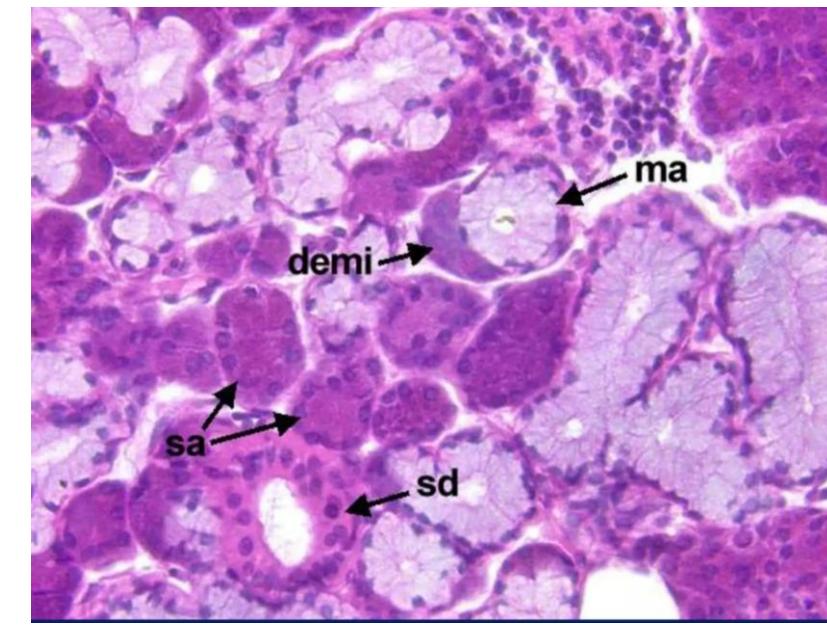
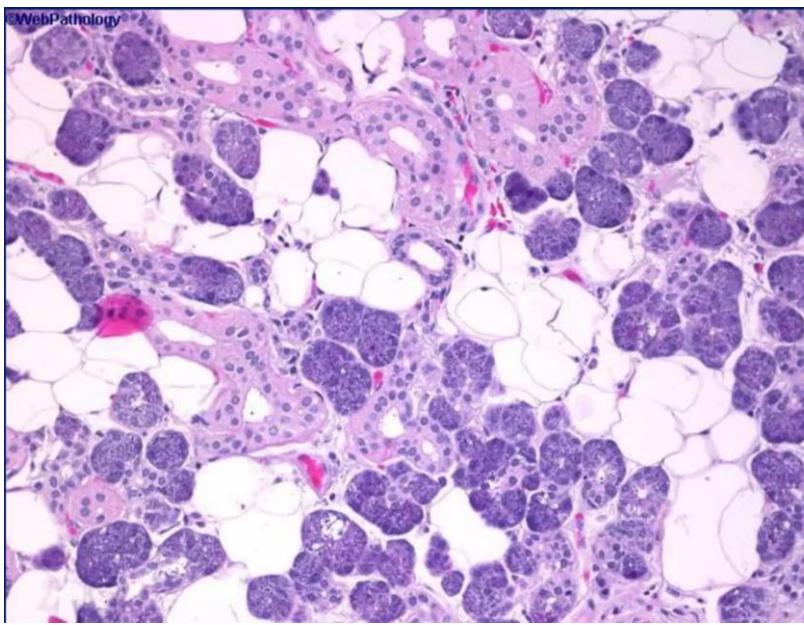
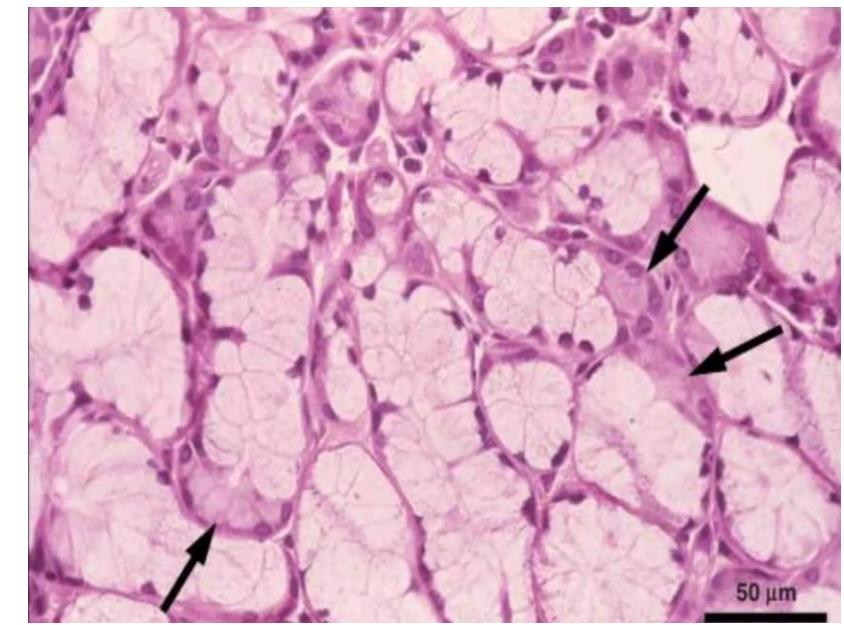
- Presence of many serous & few mucous acini
- Many striated ducts
- Serous demilunes



## Sublingual Gland

- Presence of many mucous acini
- Few striated ducts





# Thank you

