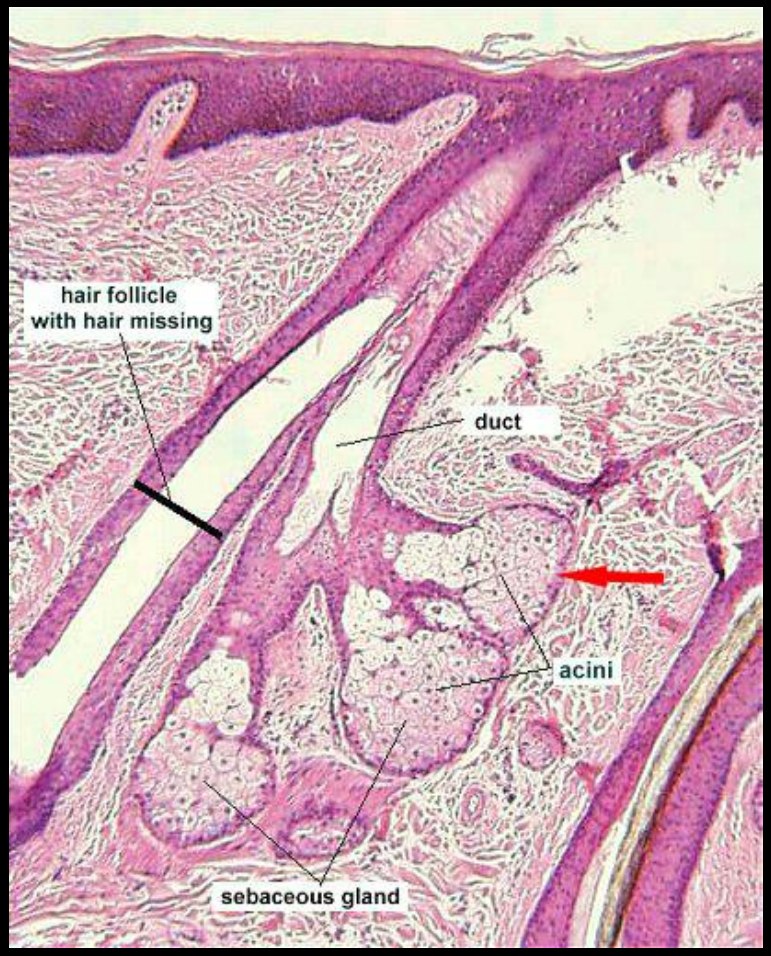
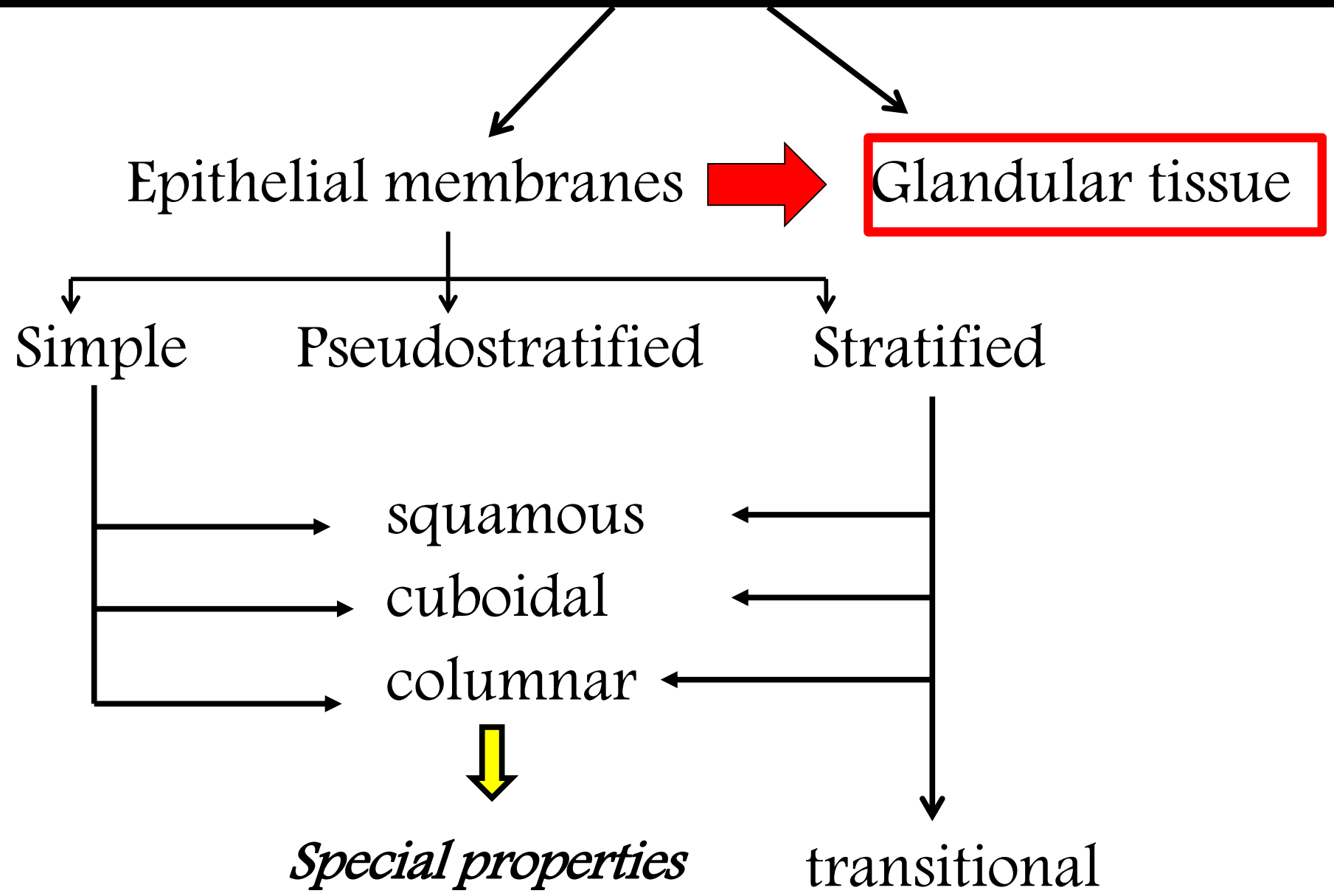
Glandular Tissue



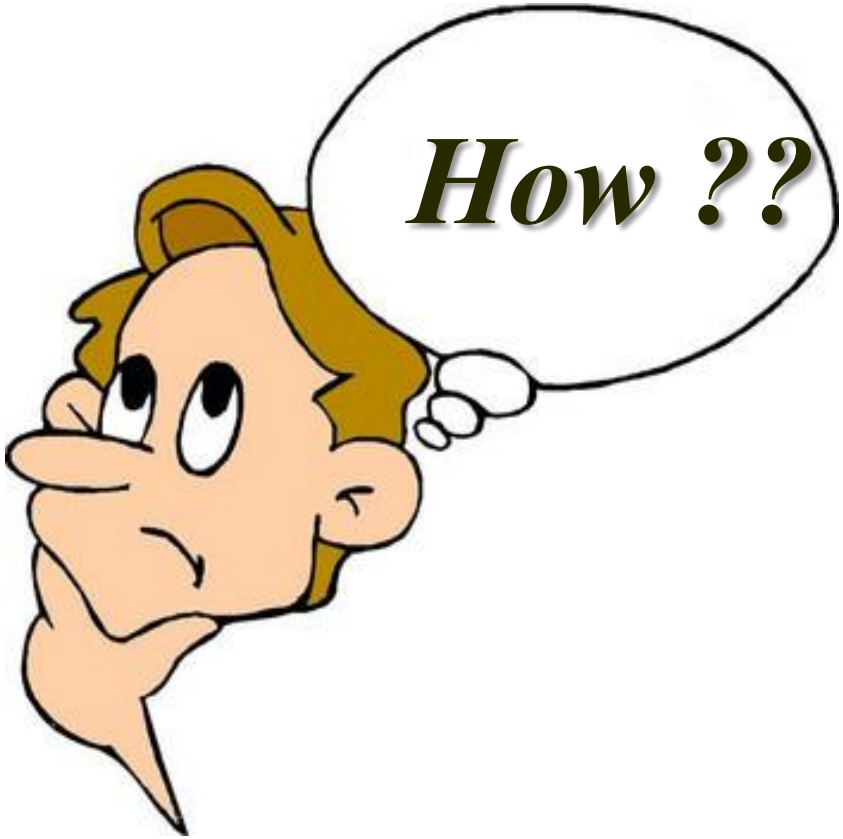
Objectives

- Outline the classification of glandular tissue
- State the differences between ‘exocrine’ & ‘endocrine’ glands
- Describe capsule, lobes, lobules, acini and a branching duct system
- Describe the differences between serous, mucous & mixed glands
- Describe the differences between merocrine, apocrine & holocrine glands

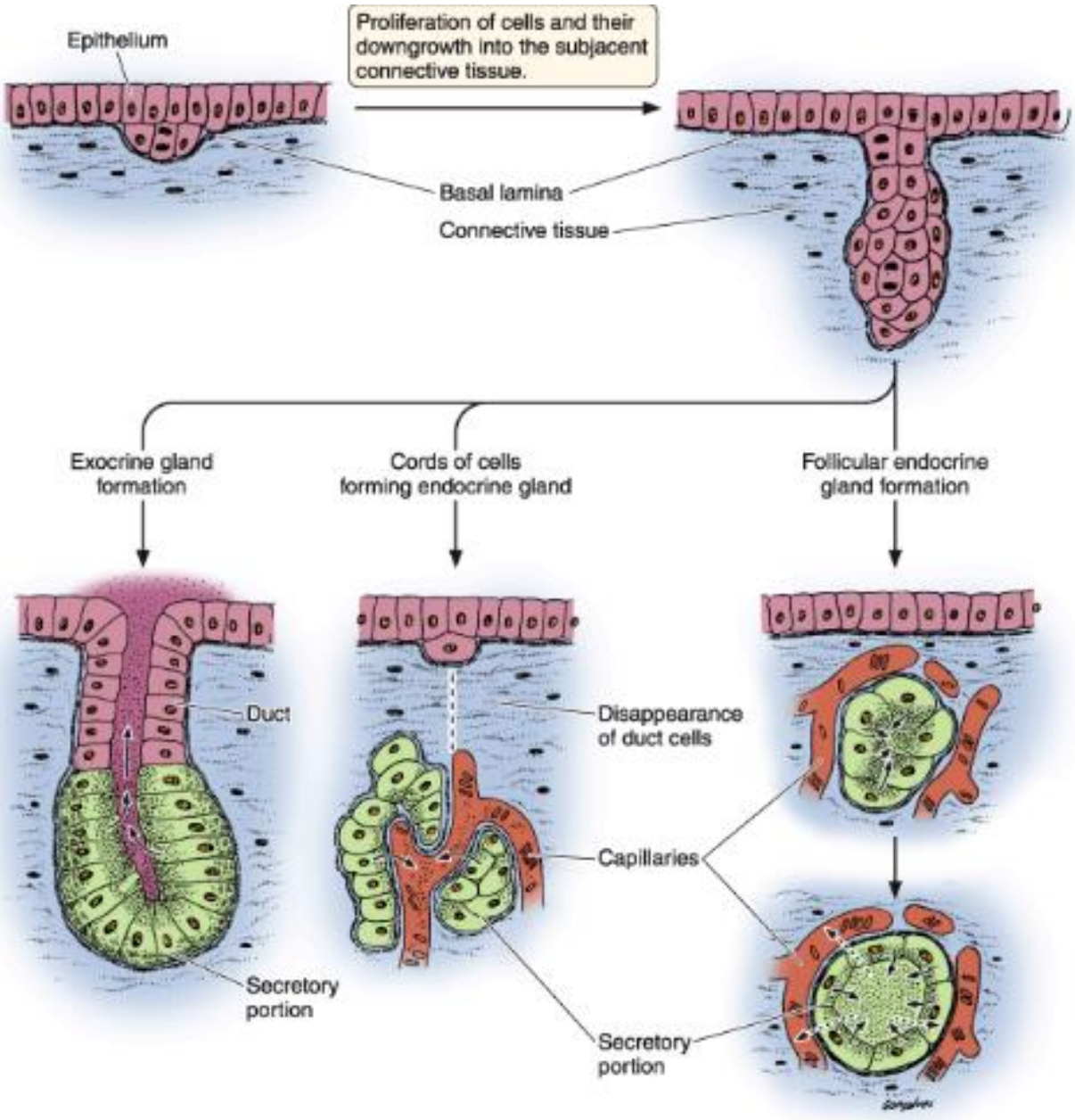
Epithelial Tissue Classification



Gland formation



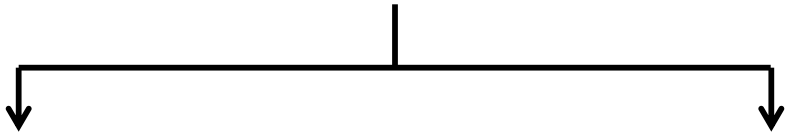
Gland formation



Exocrine and endocrine gland

Two main types

- **Endocrine glands-** convey secretions to the blood stream.
- **Exocrine glands-** communicate with the surface through a duct.
- The two main components of **exocrine glands**



Secretory units **ducts**

Glands with a duct system

- **from the capsule** → **interlobular septa** → **Intralobular ducts** → **Simple cuboidal epithelium**
- **Gland** → Divides into → **Lobules**
- Within the lobule
- **Intralobular ducts** → Conveyed to → **Secretory acini**

•***Larger ducts*** → a thicker lining of ***stratified cuboidal or columnar epithelium*** and open into the main duct.

Classification of the glandular tissue

Classification and characteristic features of glands vary and depend on

- the form and arrangement of the component parts
- the nature of the secretion
- the mechanism of secretion

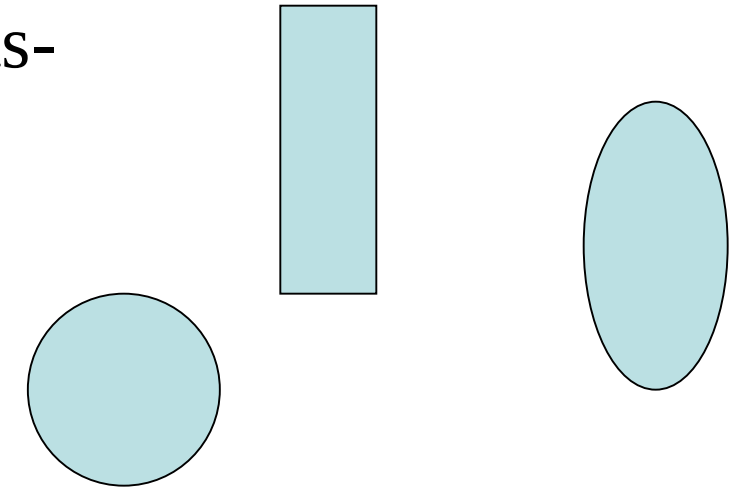
Structural variation of glands

The shape of the secretary units-

tubular ⟶ elongated

alveolar ⟶ ovoid

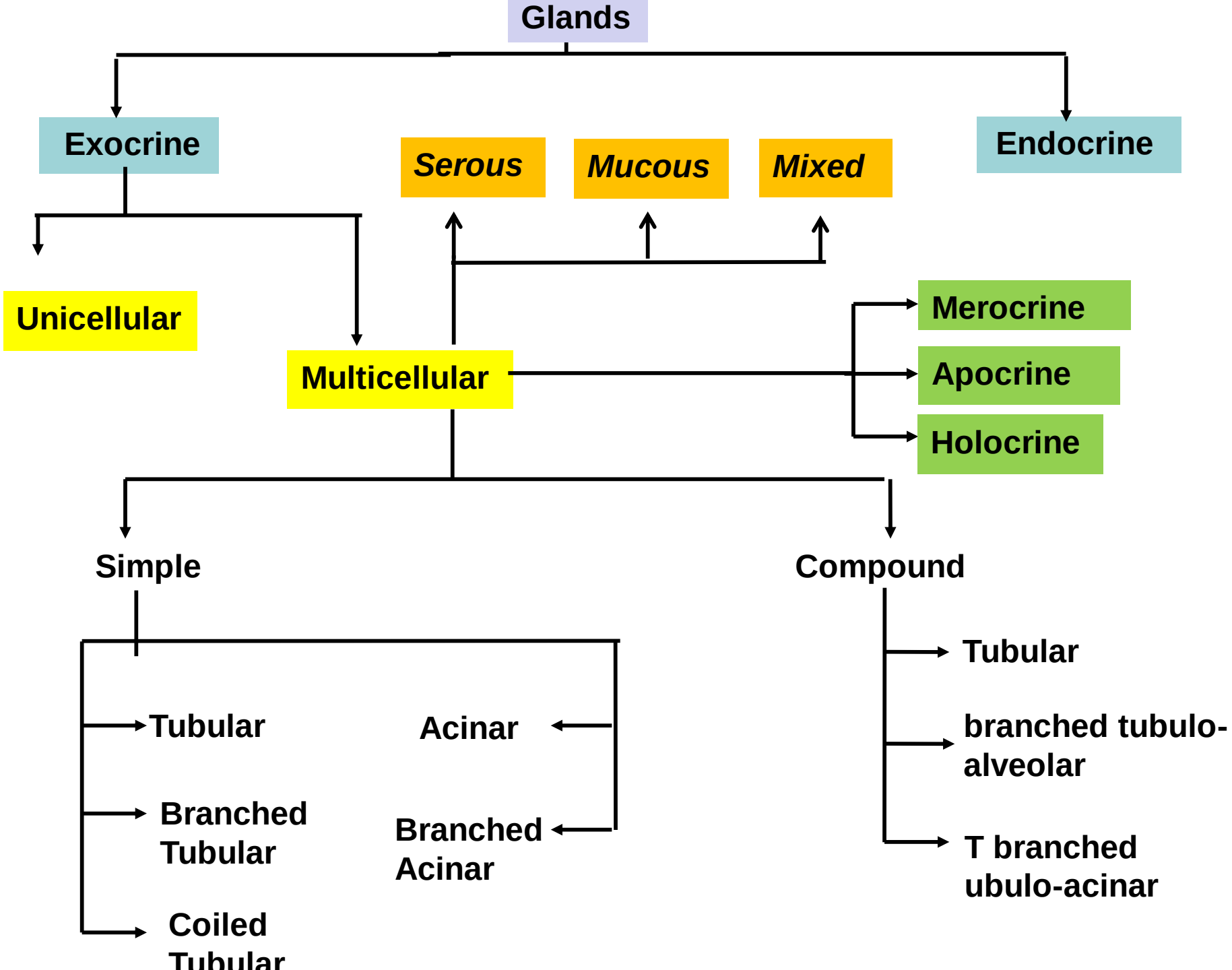
acinar ⟶ rounded



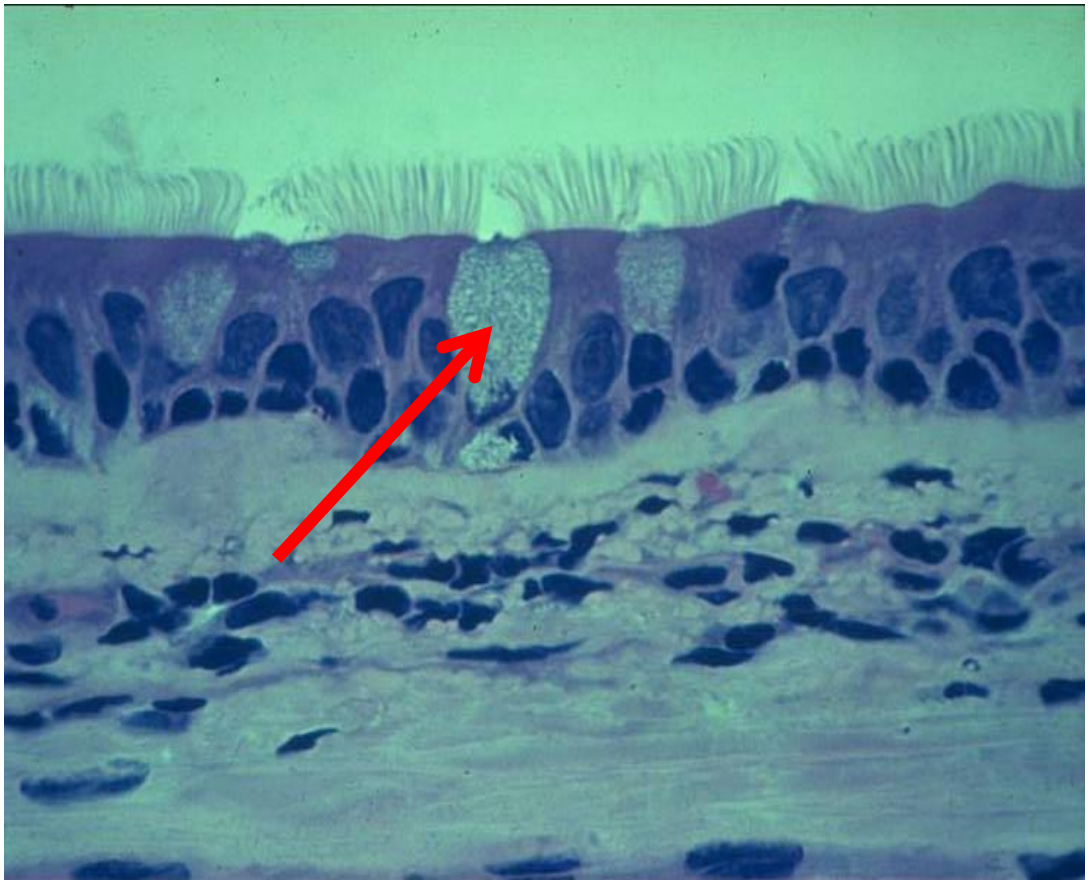
The pattern of branching of the ducts-

simple or unbranched

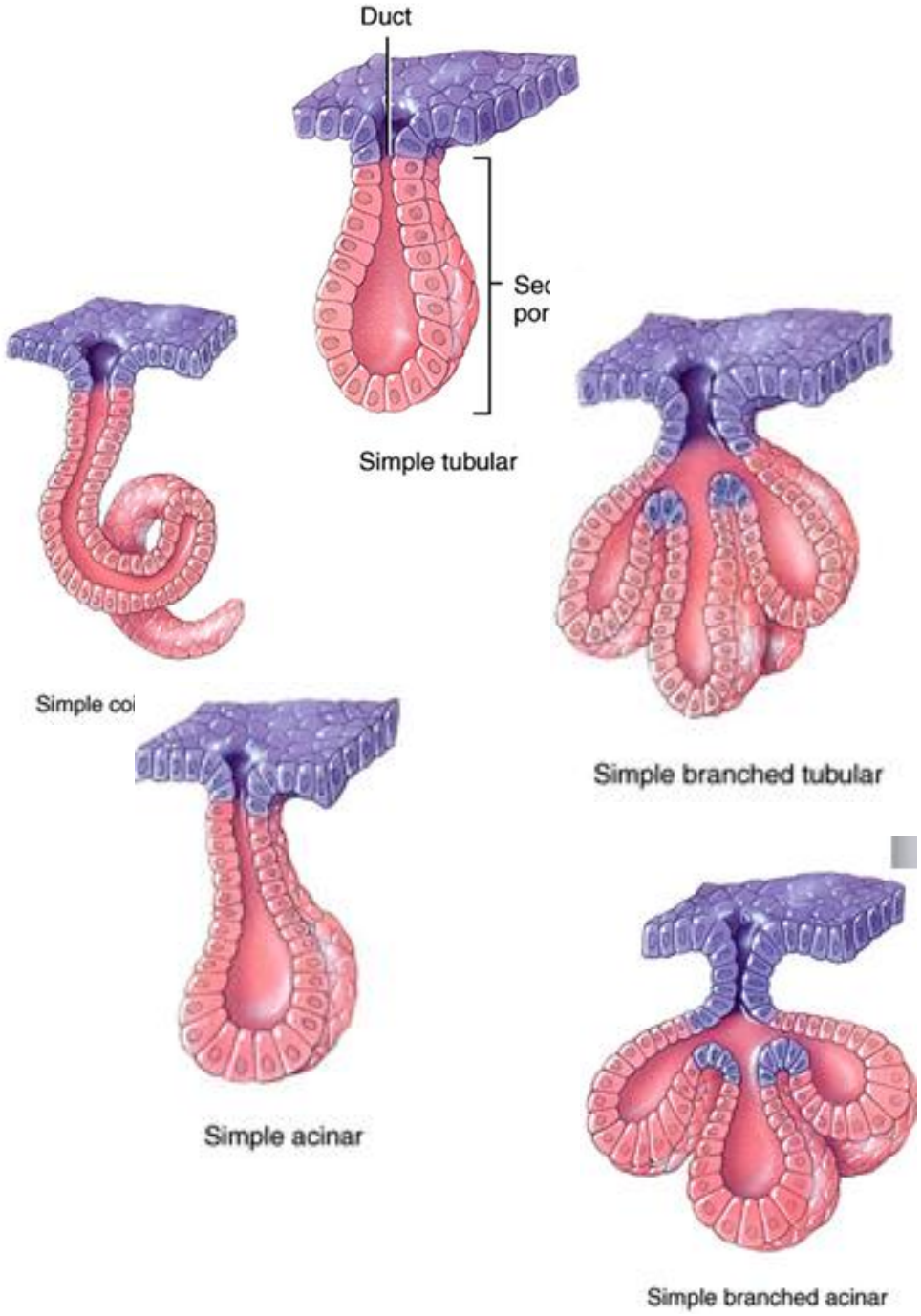
compound or branched


Glands
Exocrine
Endocrine
Serous
Mucous
Mixed
Unicellular
Multicellular
Merocrine
Apocrine
Holocrine
Simple
Compound
Tubular
Branched Tubular
Coiled Tubular
Acinar
Branched Acinar
Tubular
branched tubulo-alveolar
T branched ubulo-acinar

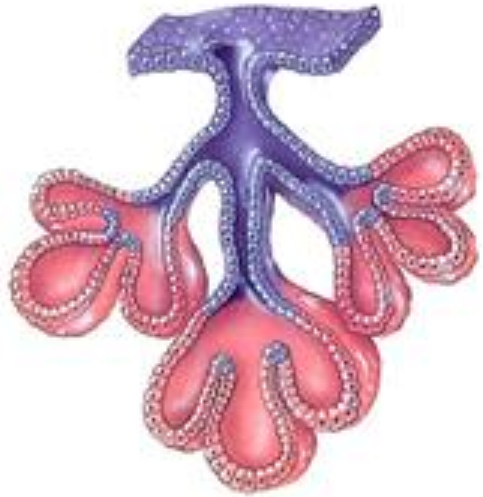
Goblet cells = unicellular gland



- **Simple tubular** – crypts of Lieberkuhn- intestine
- **Simple coiled tubular-** sweat glands
- **Simple branched tubular-** gastric glands
- **Simple acinar**-urethral glands
- **Simple branched acinar – sebaceous glands**

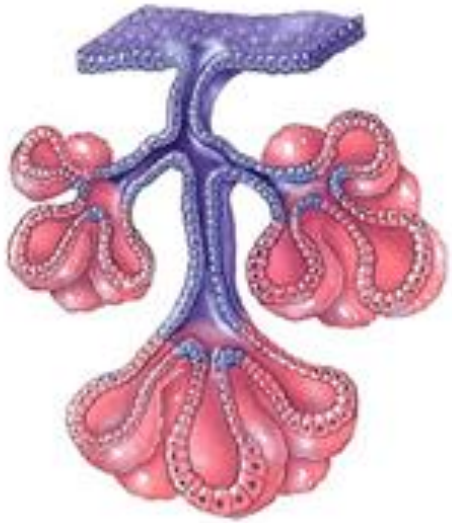


- **Compound tubular-**
  Brunner's glands
- **Compound acinar-**
  Pancreas
- **Compound branched tubulo-alveolar-**
  Prostate
- **Compound branched tubulo-acinar-**
  Submandibular gland



Compound acinar

Compound tubular



Compound tubuloacinar

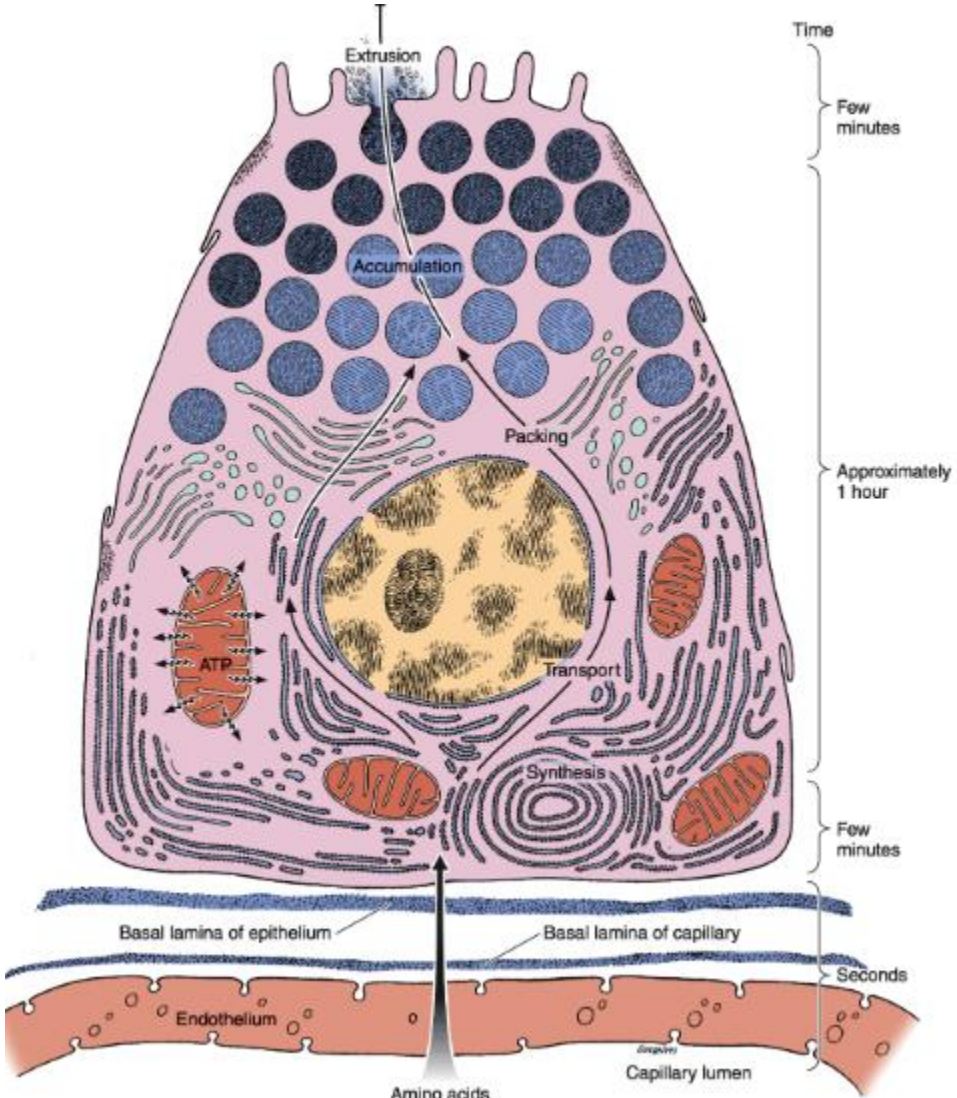
Classification – according to the nature of the secretion

- Glands may be **serous, mucous or mixed**
- Glands which secrete **watery** fluid are **serous glands** eg. parotid salivary gland, exocrine pancreas
- Glands which secrete **thick mucous** like secretion are **mucous glands**
- **Mixed glands contain**
  - serous units
  - mucous units
  - mixed units

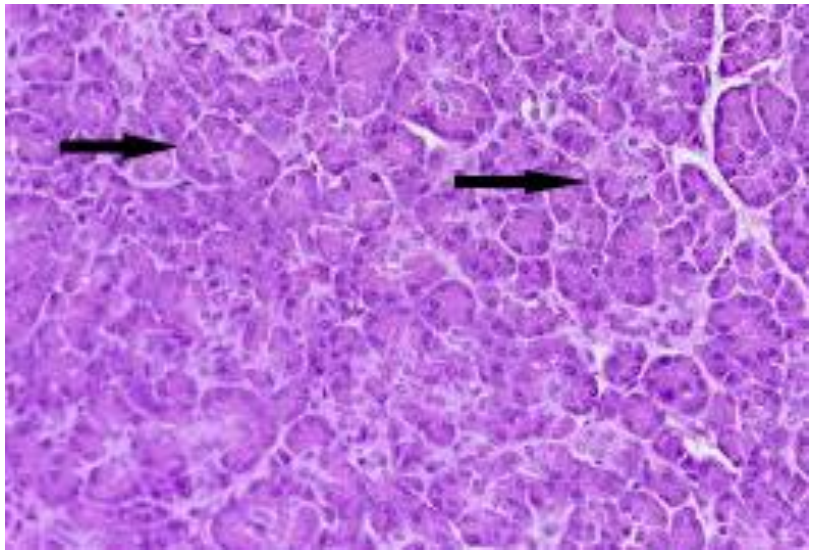
Serous glands

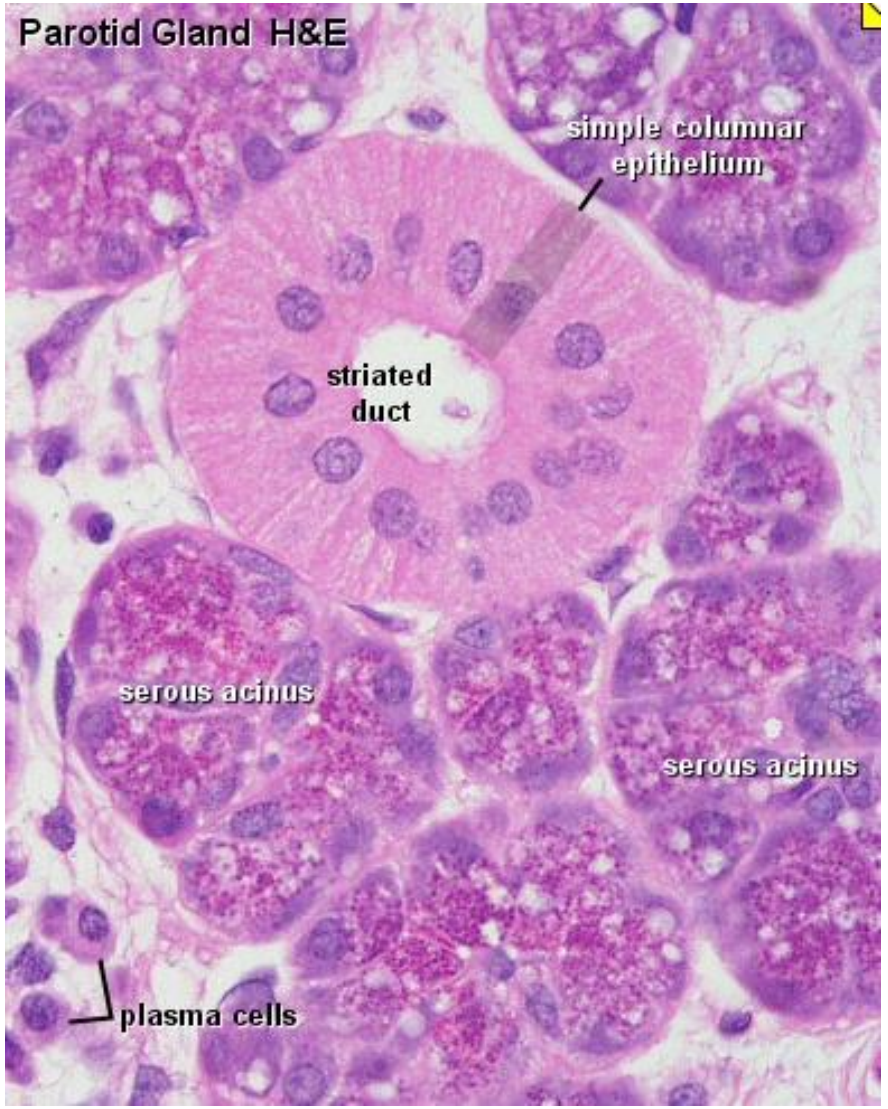
- The secretory cells are arranged as **serous units**
- cells are deeply stained, bluish granular cytoplasm containing ribosomes and rER and secretory granules
- nuclei are rounded situated at the base
- secretions are protein in nature

Serous cell


Time
Extrusion
Few minutes
Accumulation
Packing
Approximately 1 hour
ATP
Transport
Synthesis
Few minutes
Basal lamina of epithelium
Basal lamina of capillary
Seconds
Endothelium
Capillary lumen
Amino acids

Serous glands

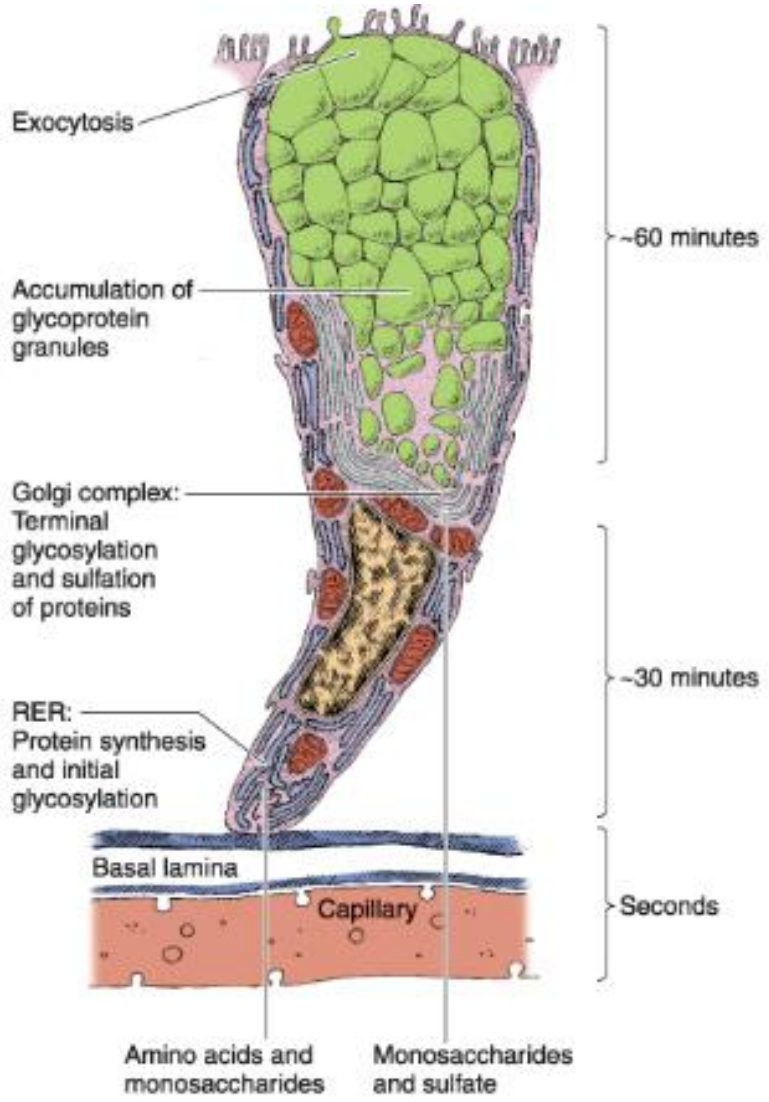


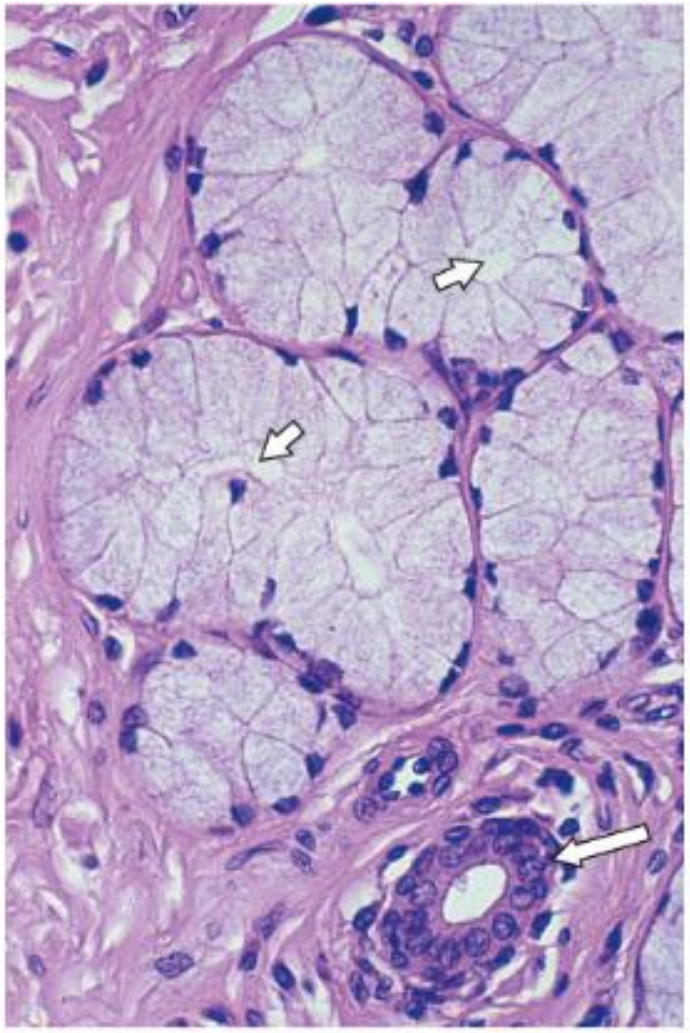


Mucous glands

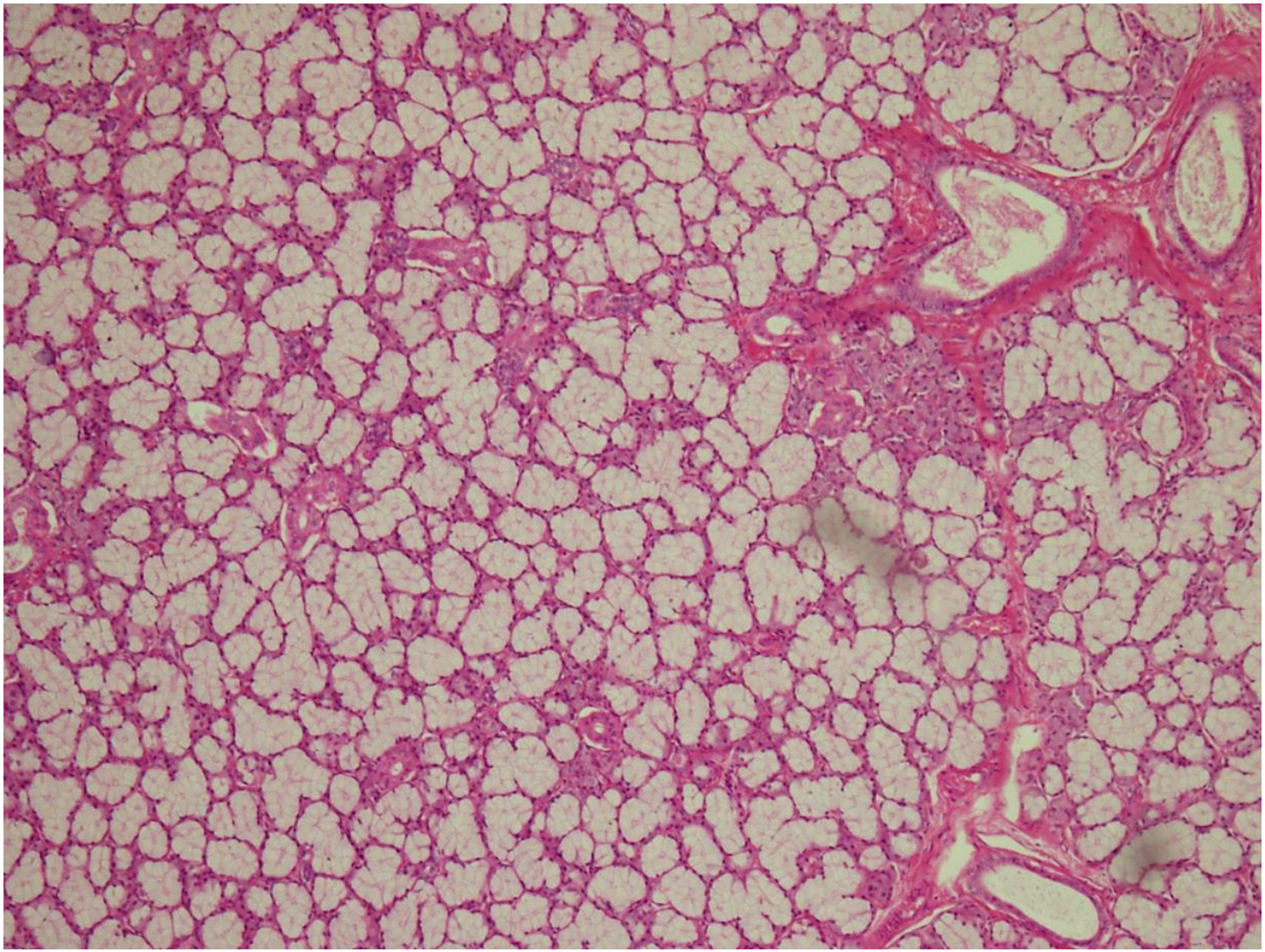
- The cells of a mucous unit contain drops of mucous in the cytoplasm
- Mucous stain pale with Hematoxyline & Eosin
- Nuclei are pushed to the base by the mucous droplets and become flattened
- Eg. sublingual gland

Mucous cell


Exocytosis
Accumulation of glycoprotein granules
Golgi complex: Terminal glycosylation and sulfation of proteins
RER: Protein synthesis and initial glycosylation
Basal lamina
Capillary
Amino acids and monosaccharides
Monosaccharides and sulfate
~60 minutes
~30 minutes
Seconds



Mucous glands



Mixed glands

:

- mucous units capped by a crescentic mass of serous cells is known as **serous demilunes**
- In the mixed units-, secretions from the serous cells
- pass through canals between the mucous cells and conveyed to the lumen of mucous unit

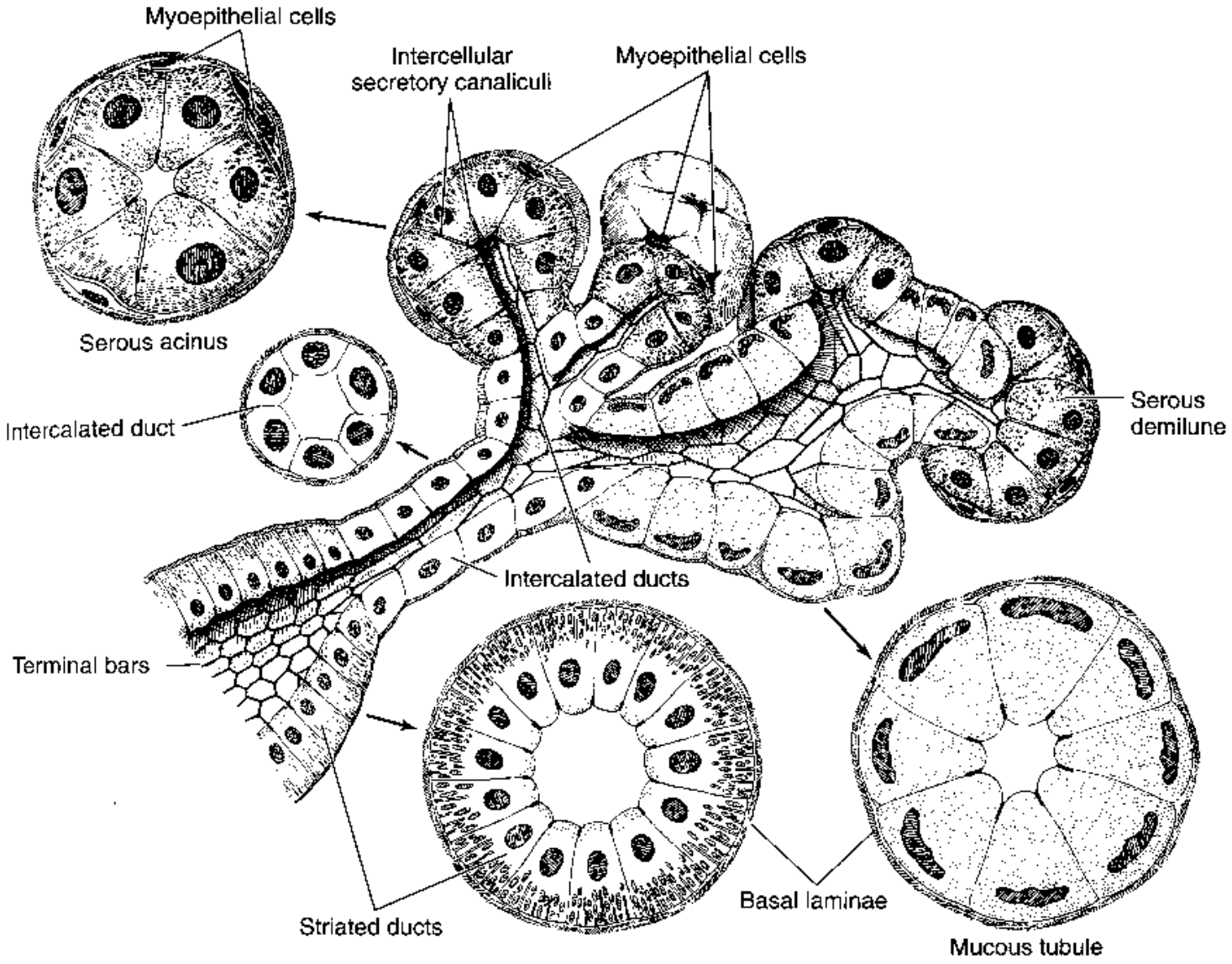
  - Eg. Submandibular gland

Mixed glands

- **In a mixed gland**

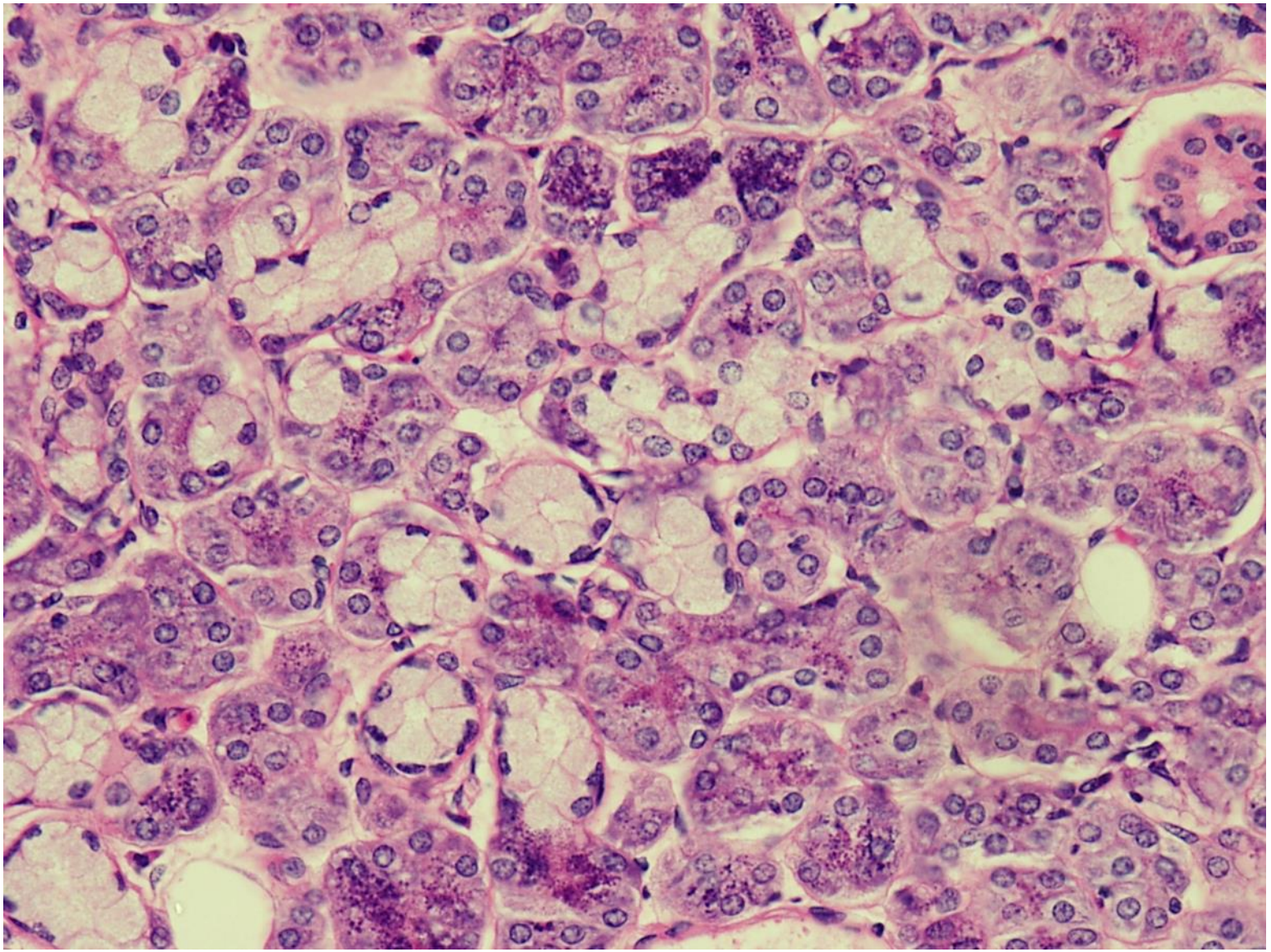
  separate serous units

  separate mucous units are capped by serous units
- secretory units are embraced by myoepithelial cells known as **basket cells**
- numerous cytoplasmic processes
- a contractile function
- help to expel the secretions into the lumen.



- Submandibular gland

Mixed glands



Classification – according to the mechanism of secretion

3 types

Merocrine type

Holocrine type

Apocrine type

Merocrine type of secretion-

- Glands store secretions in the form of secretory granules
- discharge into the lumen by a process of exocytosis

eg. salivary glands

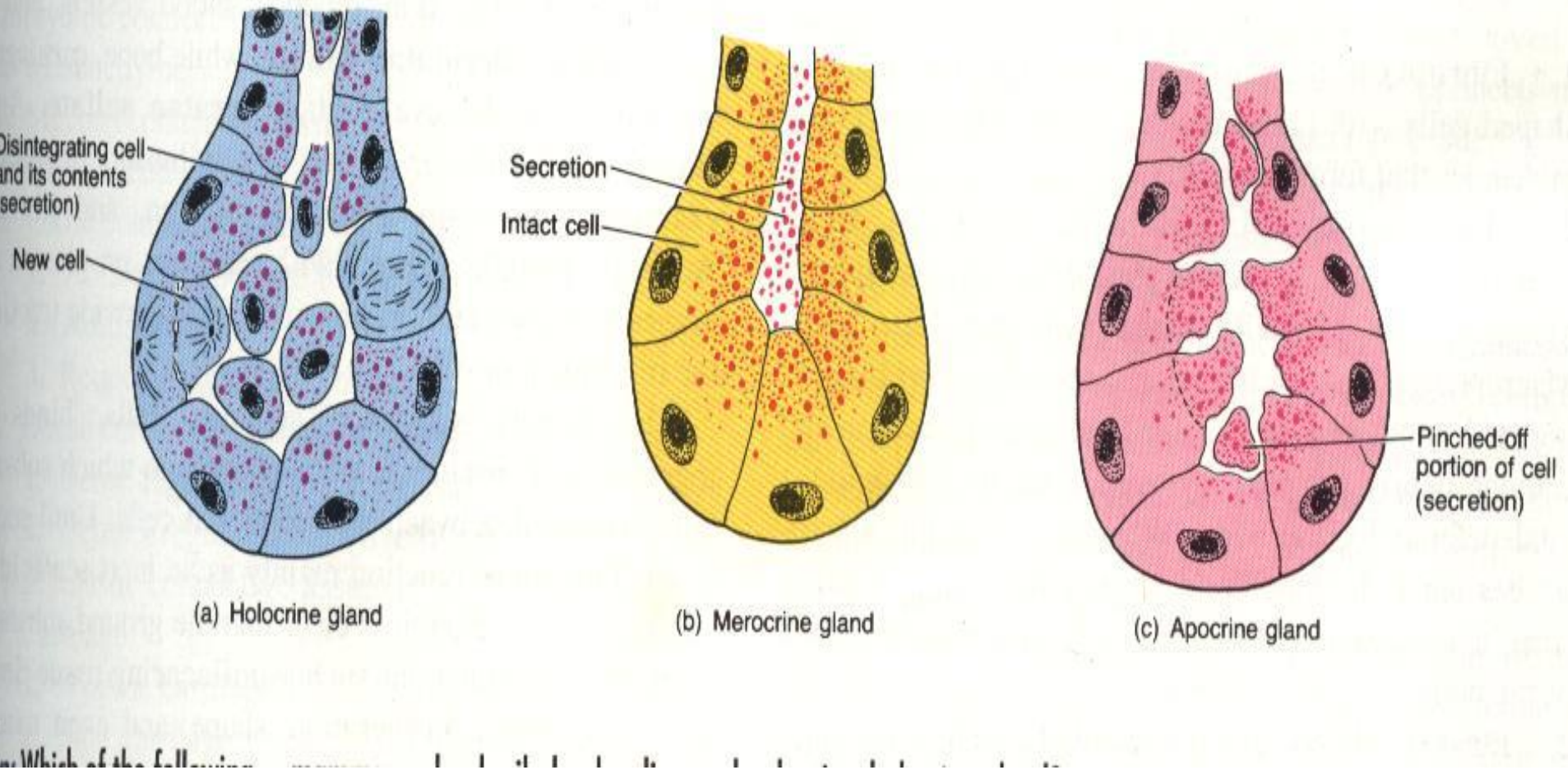
pancreas

Holocrine type of secretion

- entire cell disintegrates form secretion conveyed to the lumen and discharged out
- Sebaceous gland

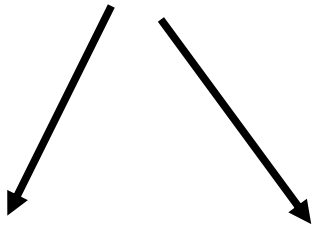
Apocrine secretion

- part of the cytoplasm is discharged as secretion
- mammary gland
- large axillary sweat glands


Disintegrating cell
and its contents
(secretion)
New cell
(a) Holocrine gland
Secretion
Intact cell
(b) Merocrine gland
Pinched-off
portion of cell
(secretion)
(c) Apocrine gland

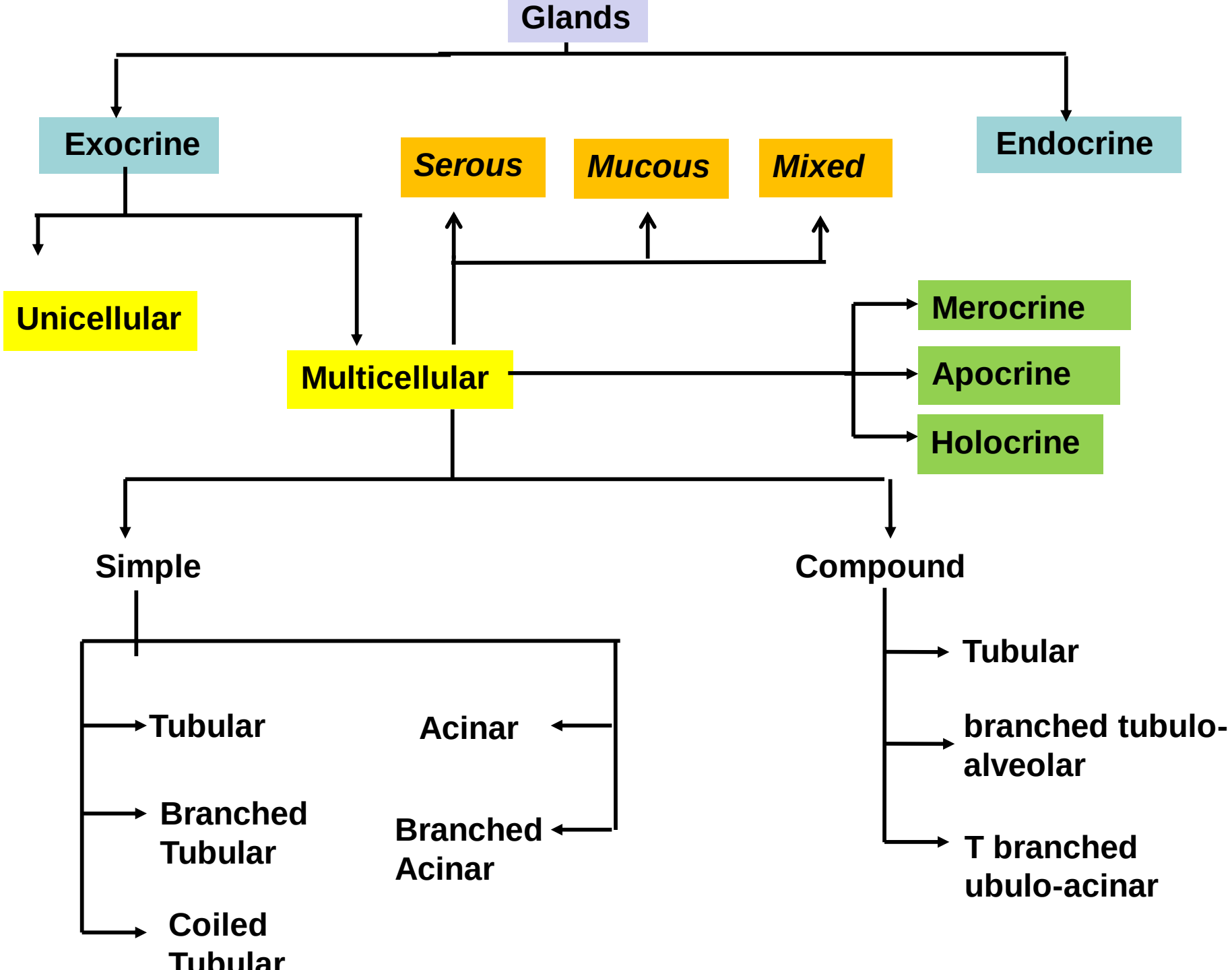
Control of Glandular Activity

Sensitive to both **neural** & **endocrine** control



salivary glands **pancreas**

SUMMERY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REFFERENCES

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- Burkit, H.G, young, B. (1993). **Wheaters functional histology**. 4 th ed., london:Churchill livingstone


Thank you