

Glandular Epithelium

● Definition

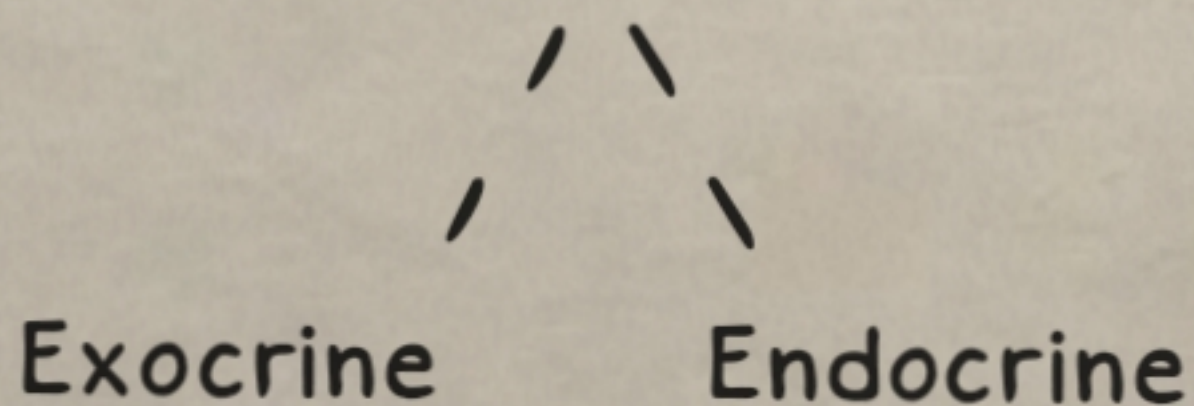
“Glandular epithelium is formed by cell specialized to produce secretions”

→ These cells synthesize, store and secrete proteins, lipids or carbohydrates

→ Glands have a secretory portion and a duct

● Classification

《 Based on Target: Blood or Skin/Body Cavities 》



i) Exocrine glands:

- Release products onto

→ The free surface of the skin

or

→ Open cavities of the body (e.g. digestive, respiratory or reproductive cavities)

- Products are not released in blood

- Further divided into two types:

> Unicellular exocrine glands

- They have no ducts
- Secretions are released directly on the free surface of the body
- Example: Goblet cells

> Multicellular exocrine glands

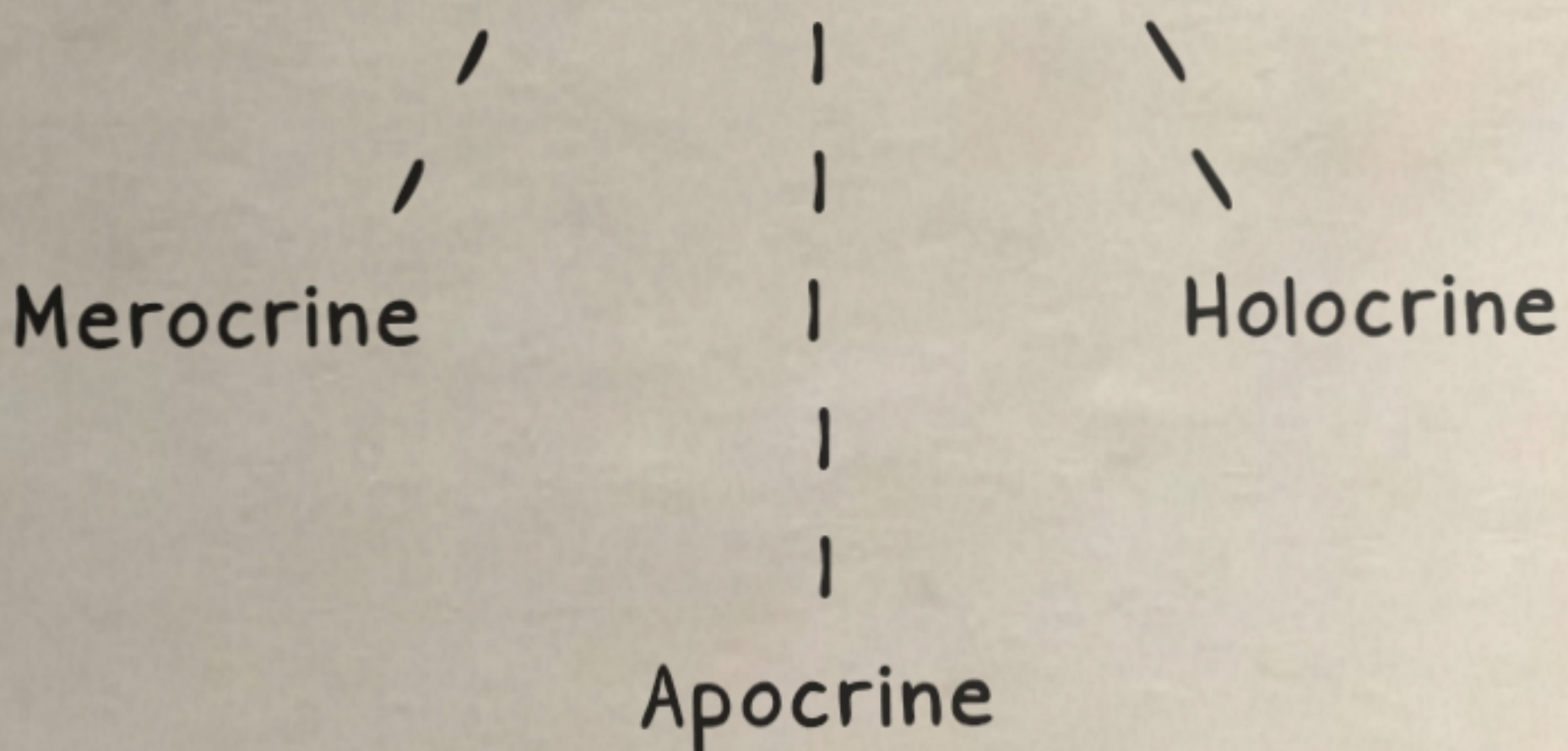
- Developed from covering epithelium by invagination
- Covering epithelium invaginates down into the underlying tissue to form a simple or branched tube

- They have ducts
- Outer ends/openings of the tube → secretory part
- Example: Sweat + sebaceous glands

ii) Endocrine glands

- They release their products (hormones) directly into the blood
- No ducts
- Not in contact with any body cavity
- Surrounded directly by other tissues
- Example: Pituitary, pancreas and pineal gland

《 Based on Mechanism of Secretion 》



i) Merocrine gland

- No part of the cell (cytoplasm or cell membrane) is lost with the secretion
- Products are secreted by exocytosis
- Location: Salivary + pancreatic glands

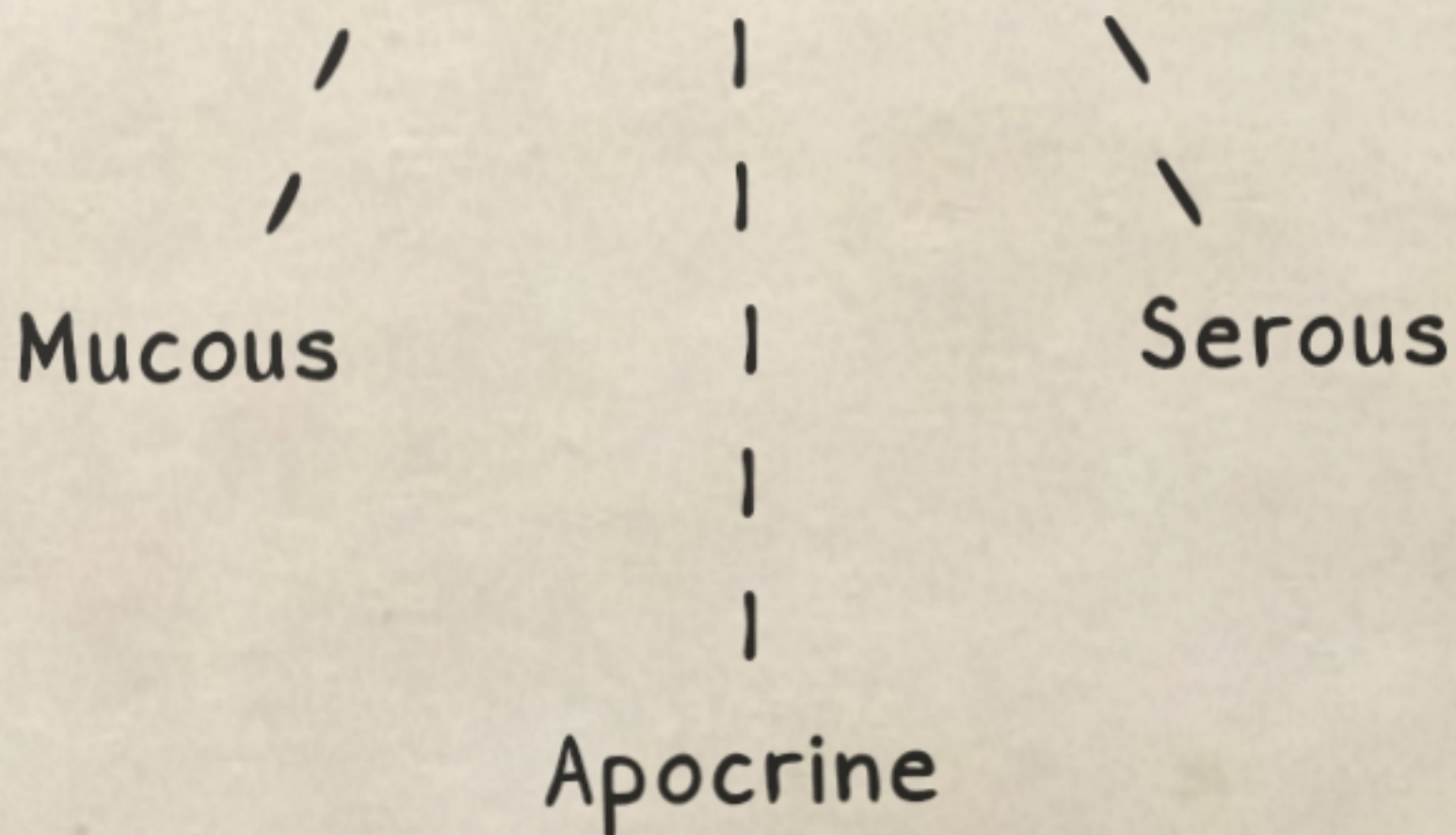
ii) Holocrine gland

- Loss of entire cell along with the secretory product
- Cell bursts and dies
- Location: Sebaceous glands

iii) Apocrine gland

- Release of apical portion of cell (cytoplasm + cell membrane) with the secretory product
- Location: Mammary glands + sweat glands of axilla

《 Based on type of secretion 》



i) Mucous gland

- Secretion: Mucin (Viscous, slimy and glycosylated proteins)
- Cell: Goblet cells
- Location: Sublingual salivary glands + surface cells of stomach

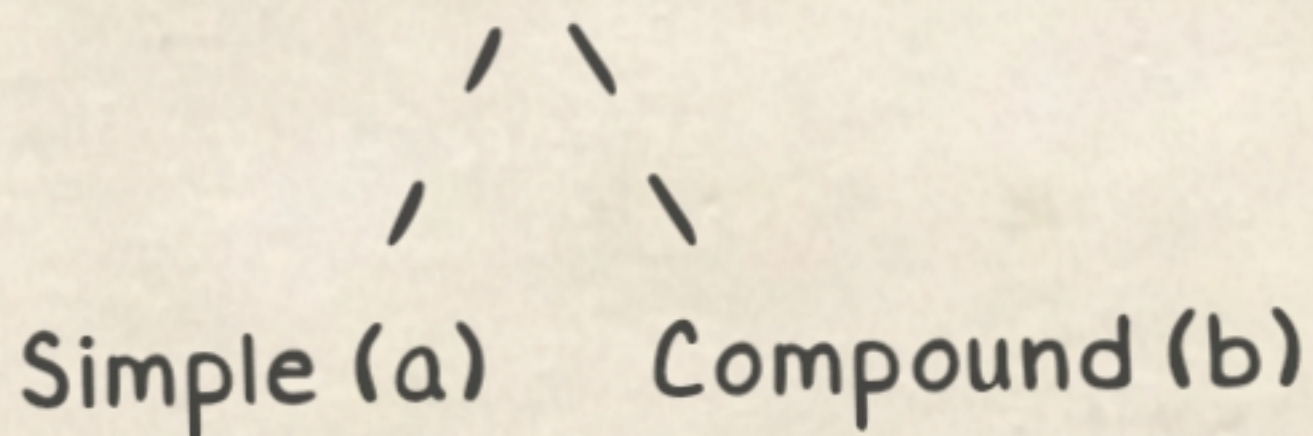
ii) Serous gland

- Secretion: Thin, watery and proteinaceous
- Location: Parotid gland + Pancreas

iii) Mixed gland

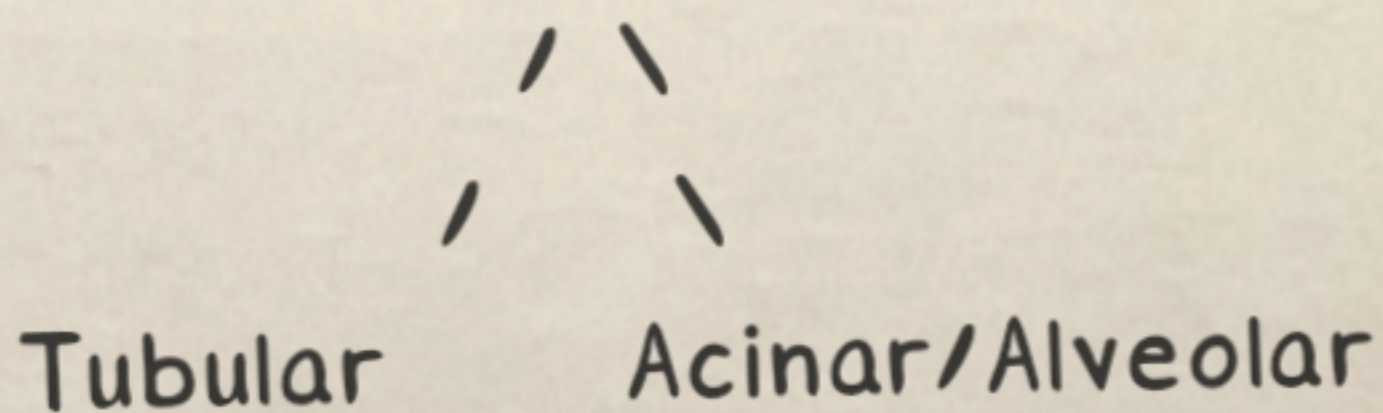
- Secretion: Mucous + serous both
- Location: Submandibular + sublingual glands

《 Based on Structure 》



a) Simple gland

(Have a single unbranched duct)



● Tubular Gland: Simple + Branched + Coiled

1) Simple/Straight Tubular Gland

- Elongated secretory portion
- Duct: Short or absent
- Examples: Mucous+ Intestinal gland

2) Branched Tubular Gland

- Multiple long secretory portions entering the same duct
- Examples: Glands of uterus and stomach

3) Coiled Tubular Gland

- Secretory portion: Very long and coiled
- Examples: Sweat glands

● Acinar Gland: Simple + Acinar

1) Simple Acinar Gland

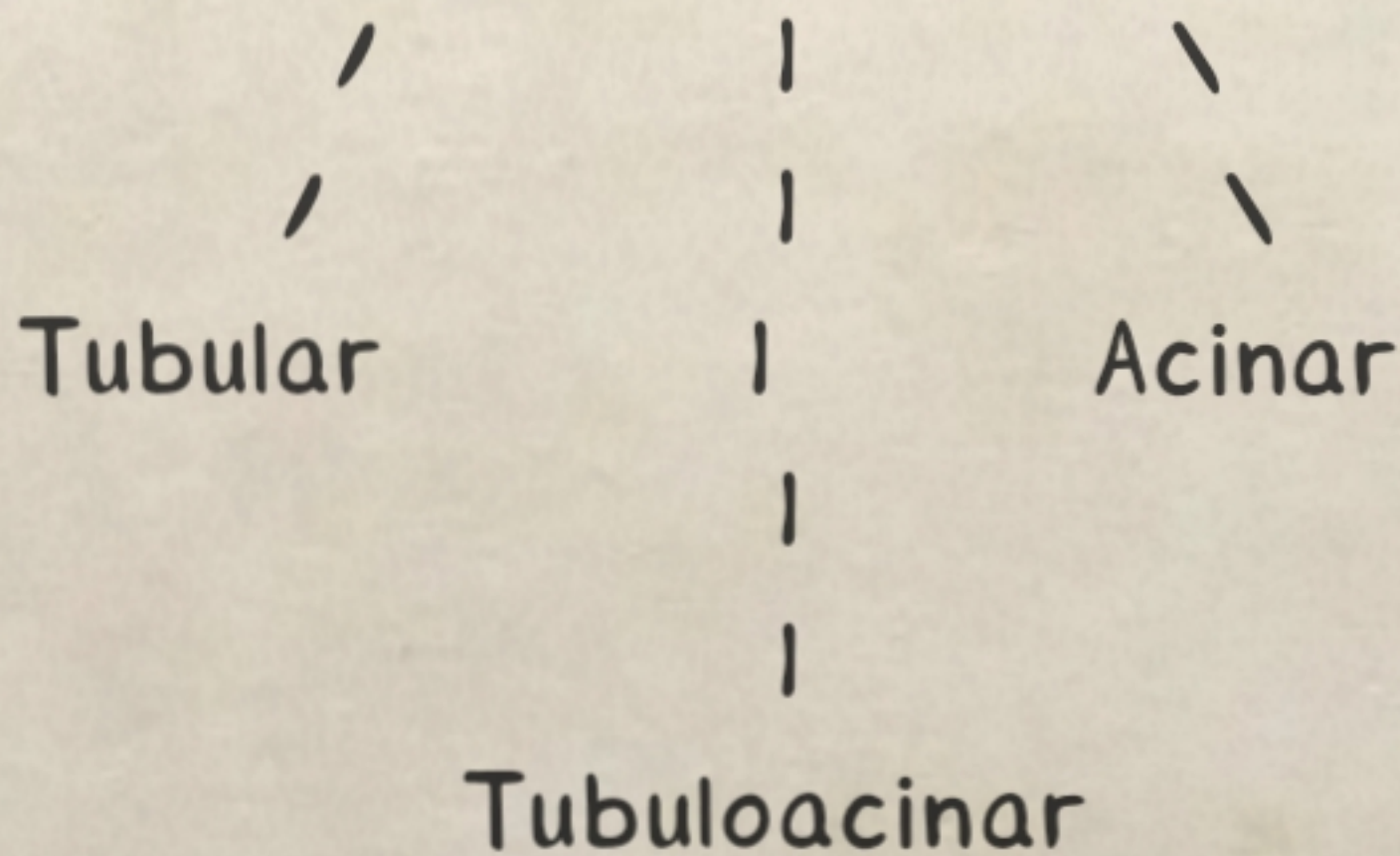
- Rounded sac like secretory portion
- Example: Small mucous gland along urethra

2) Branched Acinar Gland

- Multiple sac like sac-like secretory portions entering the same duct
- Example: Sebaceous glands of the skin

b) Compound Glands

(Have multiple branched ducts)



1) Compound Tubular Gland

- Several elongated secretory units and their ducts converge to form a single large duct
- Example: Sub-mucosal gland (Gland of Brunner) in the duodenum

2) Compound Acinar/Alveolar

- Several sac like secretory units and their ducts converge to form a single large duct
- Example: Exocrine glands of pancreas

3) Compound Tubulo-Acinar gland

- Have ducts of both tubular and acinar secretory units converging to form a single large duct
- Example: Salivary glands

Medical Terminologies

» Carcinoma: Malignant tumor of epithelial origin

» Adenocarcinoma: Malignant tumor of glandular epithelial origin

» Dysplasia: Abnormal growth of epithelial cells

» Neoplasia: Abnormal pre-cancerous growth

» Metaplasia: Reversible substitution of one type of fully differentiated cell for another within a given tissue

- In cigarette smokers, pseudostratified ciliated columnar epithelium of bronchi is substituted for stratified squamous epithelium