Glandular Epithelium

A **gland** is an **organ**in an animal's body that synthesizes a substance such as hormones for release into the bloodstream(*endocrine gland*)

or into cavities inside the body or its outer surface (*exocrine* gland). Numerous glands exist throughout the human body.

SO there are *two types* **depending on how the cells release the substances they produce**: Exocrine & Endocrine glands

1) **Exocrine glands** secrete their product into ducts or directly onto a free surface. Their secretions include mucus, sweat, oil, ear wax and digestive enzymes.

EXO = out side and crine = secret

*** Structural classification of exocrineglands**:

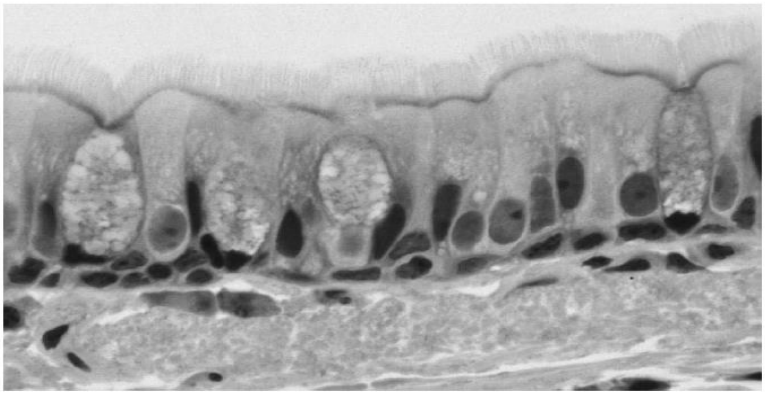
1-multicellular glands- most glands, have a distinctive appearance. *Communicates with the surface*

Examples include :-

pancreas , stomach , sweat glands , salivary glands , mammary glands , sebaceous glands , etc .

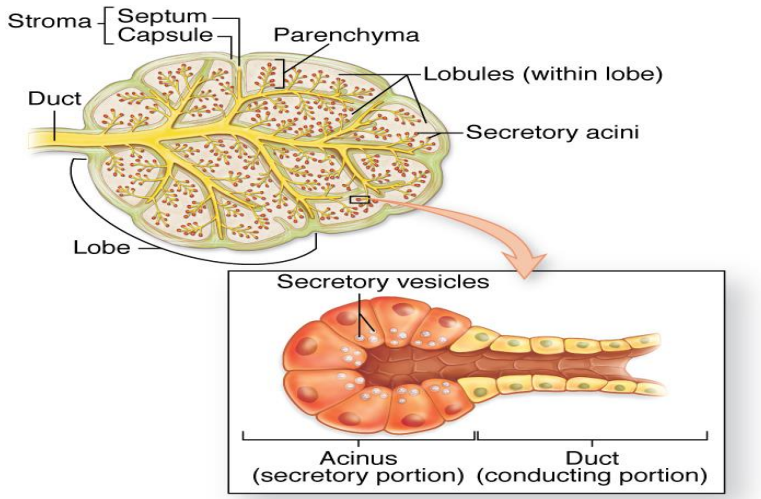
2-unicellular glands -single cell for example goblet cells(No ducts).

Unicellular goblet cells in the upper respiratory epithelium



*General structure of exocrine glands:

Exocrine glands have ducts that lead to an organ or body surface. Inside the gland the duct runs through connecting septa and branches repeatedly, until its smallest branches end in the secretory portions of the gland.



exocrine glands have 1/a secretory portion , which contains the cells specialized for secretion , and 2/ ducts , which transport the secretion out of the gland .

The morphology of these components allows the *glands to be classified as follows :-*

1-**Ducts** can be A/ **simple (un branched**)

Or **B/ compound (with two or more branches**)

2-**Secretory portions** can be: simple or compound

The simple gl can be: a\simple **tubular**(either **short** or **long** and **coiled**)

or b\simple **acinar**(**round** or **globular**)

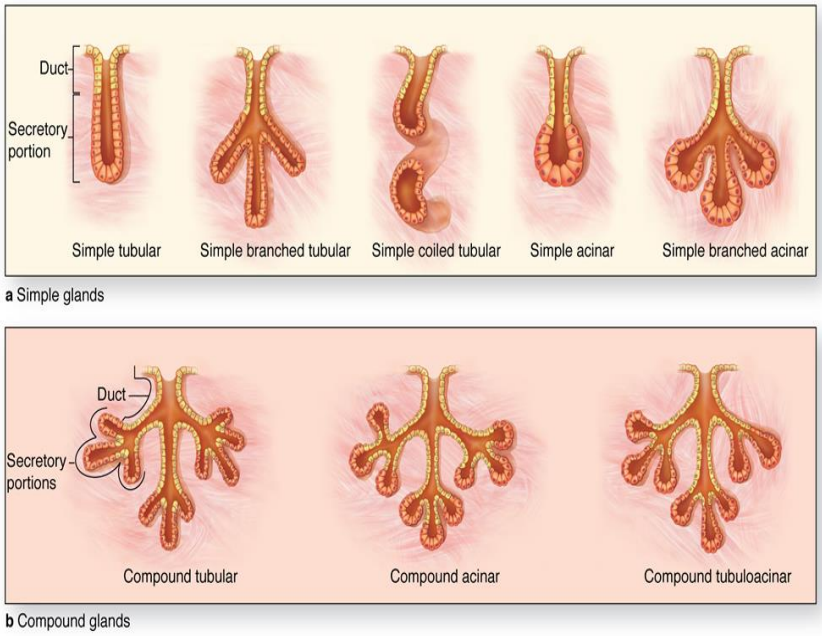
c\simple **branched (b. tubular& b. acinar) .**

The compound glands can be:

1- Compound tubular ,

2-**Compound acinar** ,

Or 3-**Compound tubuloacinar secretory portions**



Exocrine glands secrete their products through a duct onto an outer surface of the body, such as the skin or the gastrointestinal tract.
Secretion is directly onto the apical surface.

The glands in this group can be **divided into three groups** according to **secretory mechanism:**

- **Apocrine glands** a portion of the secreting cell's body is **lost** during secretion. e.g. mammary gland, sweat gland .
- **Holocrine glands** the entire cell disintegrates to secrete its substances (e.g., sebaceous glands)
- **Merocrine glands** cells secrete their substances by exocytosis(e.g., mucous and serous glands). e.g. goblet cells, salivary gland, tear gland, intestinal -- glands.==========

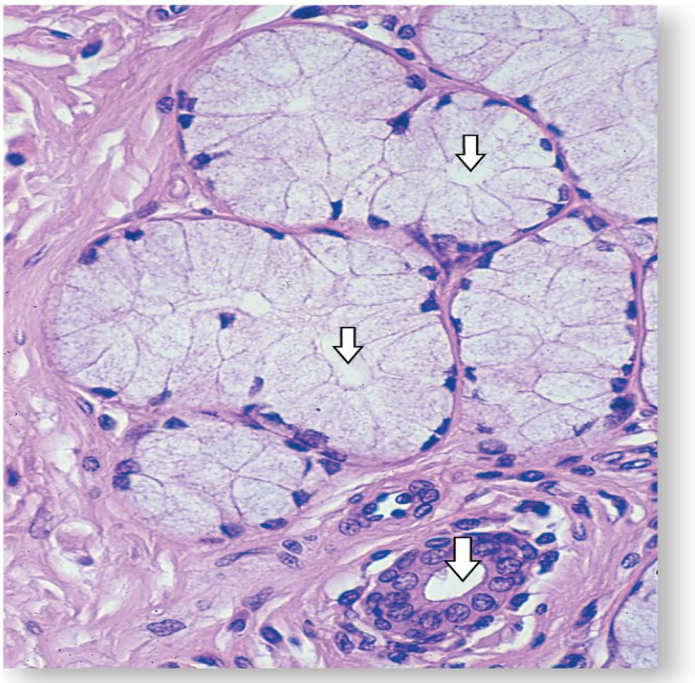
The type of secretory **product** of **exocrine glands** may also be one of three categories:

- **Serous glands** secrete a **watery** fluid like, often protein-rich product e.g. sweat gland & parotid gl.
- **Mucous glands** secrete a **viscous** product, rich in carbohydrates (e.g., glycoproteins) e.g. goblet cell.
- **Sebaceous glands** secrete a lipid product. These glands are also known as oil glands.

***Glands containing mucous acini (e.g. the *sublingual glands*) are called mucous glands.**

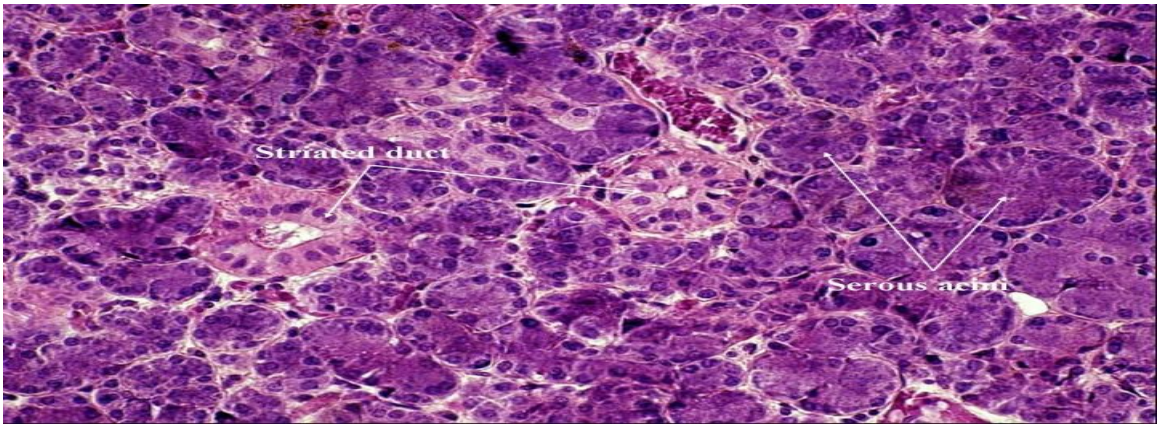
Mucous glands (glands containing cells produce a viscous secretion that lubricates and or protects the inner lining of organs) .

Morphology : the cell is pyramidal in shape , flatten nuclei are displaced basally , their cytoplasm is completely filled with a light – staining , secretory product called mucus .



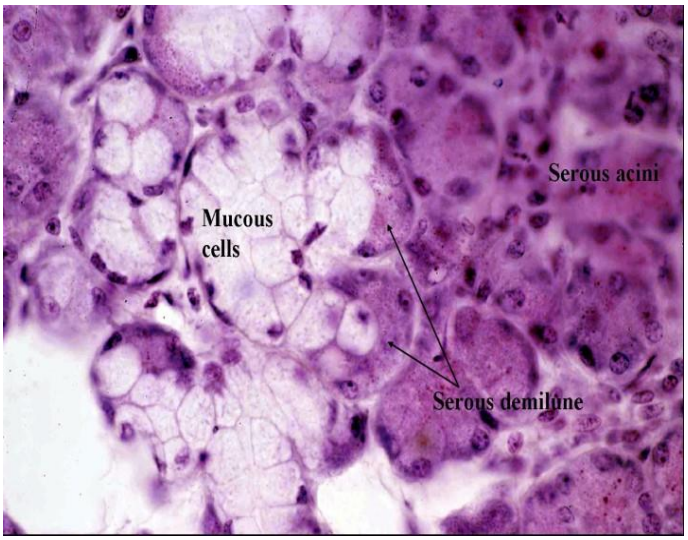
*** Glands containing serous acini (e.g. the *parotid glands*) are called serous glands.**
Serous glands (glands with cell that produce watery secretions , which are often rich in enzymes).

Morphology : are similar in shape to mucous cells also pyramidal in shape , spherical or round nuclei are displaced basally by secretory granules that accumulate in the apical regions .



*** If both types of acini are present the gland is muco-serous or mixed gland .**

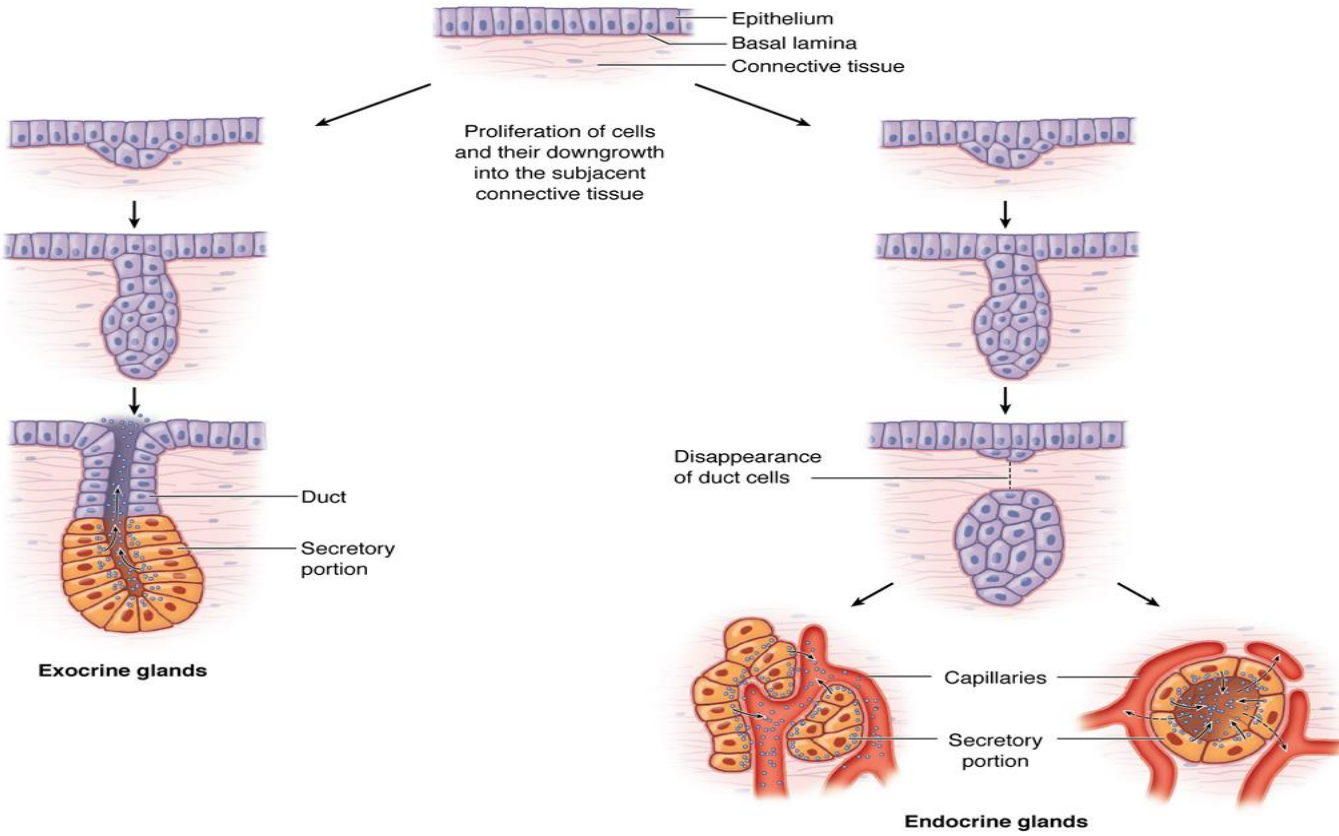
Mixed glands (glands that contain a mixture of both mucous and serous secretory cells).
Morphology : mucous cells predominant , serous cells form a crescent or moon-shaped cap over the mucous cells , called serous demilune



****Endocrine glands** - called "ductless glands" discharge their secretions or it diffuses into the blood stream. These secretions are hormones, or chemical messengers, which regulate many body functions.

Formation of glands from covering epithelia. During fetal development epithelial cells proliferate and penetrate the underlying connective tissue. They may-or may not-maintain a connection with the surface epithelium. When the connection is maintained, exocrine glands are formed; with the connection lost, endocrine glands are formed. Exocrine glands secrete to

the body surface or gut via duct systems formed from the epithelial connection.



The **cells of endocrine glands**, which secrete the hormone can be arranged in **cords** or **in follicles** with lumens for storing the secretory product. From either the cords or follicles of endocrine cells, the secretory product is released outside the cells and picked up by the blood vessels for distribution throughout the body.