SECRETION Introduction

3 distinct cellular activities:

- **Uptake** of extracellular fluid
- **Processing** of these within the cells --> Produce a more complex product
- **Active release** of these product

NOTE:
Different from EXCRETION, the passive release of waste products

Introduction (cont.)

2 functional types of glands:

Exocrine:	**Endocrine**:
- Release secretory products onto epithelial surface via a **duct**	-No ducts connecting to epithelial surface - Secrete products into blood or lymph (Product is Hormones)
Ex: salivary, sweat glands	Ex: pancreas, thyroid gland

Methods of secretion

Merocrine/Eccrine tuyến toàn vẹn	**Apocrine** Tuyến bán hủy	**Holocrine** Tuyến toàn hủy
- Exocytosis of vesicles	- Vesicles accumulate at apical portion	- Secretory products accumulate and the cell ruptures
- Most common form of secretion	--> mass of cytoplasm and vesicles are pinched off	--> Death of cell
- Ex: Sweat glands, salivary glands	Ex: mammary gland, some sweat glands	Ex: Sebaceous glands

Glandular Structure

Unicellular	**Multicellular**
Goblet cells: Found in: digestive and respiratory tracts --> Secretes mucin -> Mucous	Most glands

Unicellular Exocrine Gland

Goblet cell

- Amongst columnar walls of epithelium
- Found in: respiratory/digestive tracts
- -Extended apical portion (*theca*) contains **mucigen droplet**
- Released by **melocrine**(toàn vẹn) secretion
  --> Mucigen + H20 = Mucous
- Basal nucleus

Multicellular Exocrine Glands

- Secreted onto epi surface via ducts
- The deeper cells within CT is secretory
- Secretion is discharged from secretory cells, into the duct, onto epi surface

Classification of Multi Exo Glands

Classified by:

Ducts:	*Secretory End Pieces*:
- **Simple**: single, unbranched duct (may be uncoiled)	- **Tubular**: glandular cells form tubes
- **Simple branched**: 2 or more secretory areas dump into a single duct	- **Alveolar**: rounded cluster of cells
- **Compound**: branched duct system	- **Tubuloalveolar**: contain some tubular/alveolar units as well

Classification of Multi Exo Glands (cont.)

	Simple	Simple Branched	Compound
Tubular	Simple Tubular	Simple branched tubular	Compound Tubular
Alveolar	Simple Alveolar	Simple branched alveolar	Compound alveolar
Tubuloalveo	X	X	Compound tubuloalveolar

Nature of Secretory Product

Exocrine can be described based on nature of **Secretory products**:

- **Mucous glands**: thick, sticky, glycoproteins
- **Serous glands**: watery, contains enzyme
- **Mixed**: contains more than 1 cell type --> secrete both Serous and Mucous

Control of Exocrine Secretion

- Most glands **secrete at low level** continuously
- **Rate modulated by:** hormones, autonomic innervation, or both
- **In glands with alveoli** --> contractile myoepithelial cells contract to squeeze secretion into ducts

Endocrine

- **Lost connection with epi surface**
- **Secrete products directly into blood or lymph**
- **Well vascularised**
- **Secretions are hormones**: proteins, steroids
- **Adapted for storing and releasing when required**
- **Often form cords or clumps**

Thyroid gland

Endocrine cells are arranged into follicles surrounding a mass of secretory product (since it stores the product extracellularly) (colloid, thyroglobulin)