

GLANDS



What is a gland?

- **One or more cells working together to make and secrete a particular product. Made up of only one type of cell, so one tissue.**

What are two ways we can use the term secretion?

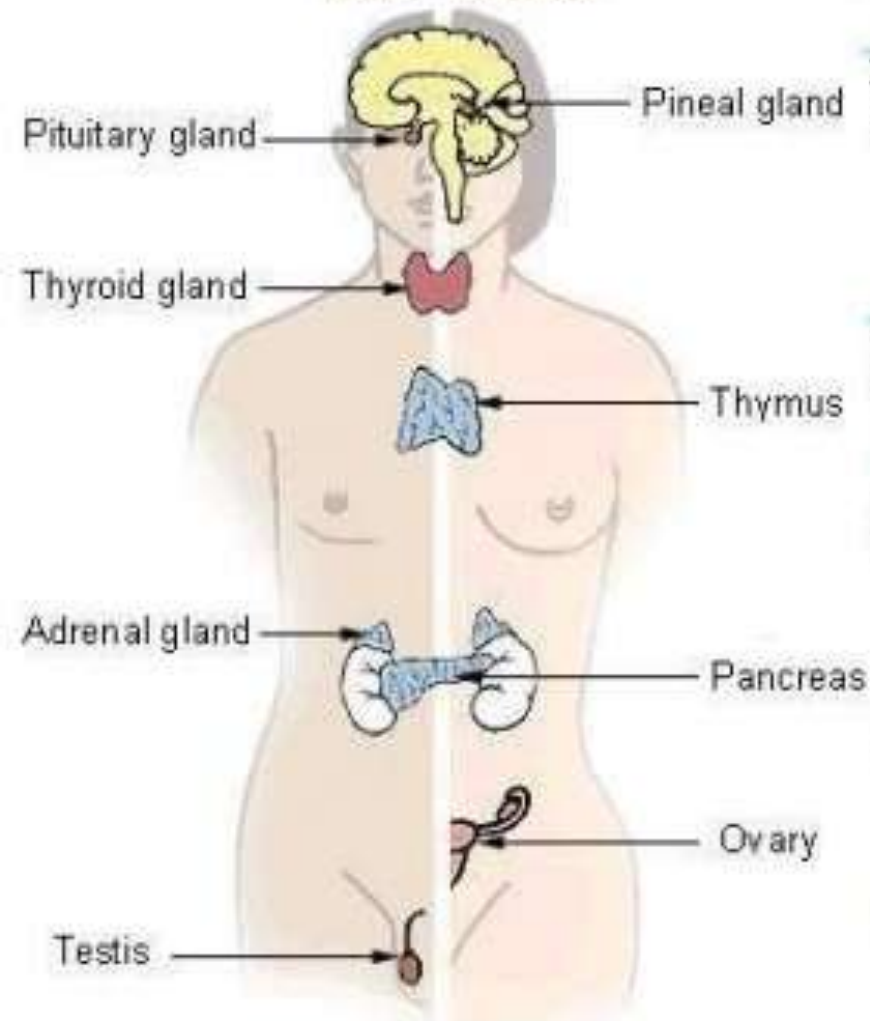
- **the process of making the product**
- **the actual product of a gland**

What are endocrine glands?

- **Ductless glands that produce hormones**
- **Exocytosis (Golgi apparatus → vesicle)**

Major Endocrine Glands

Male Female



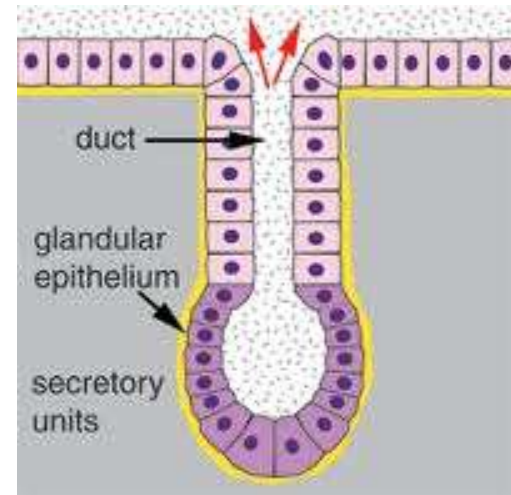
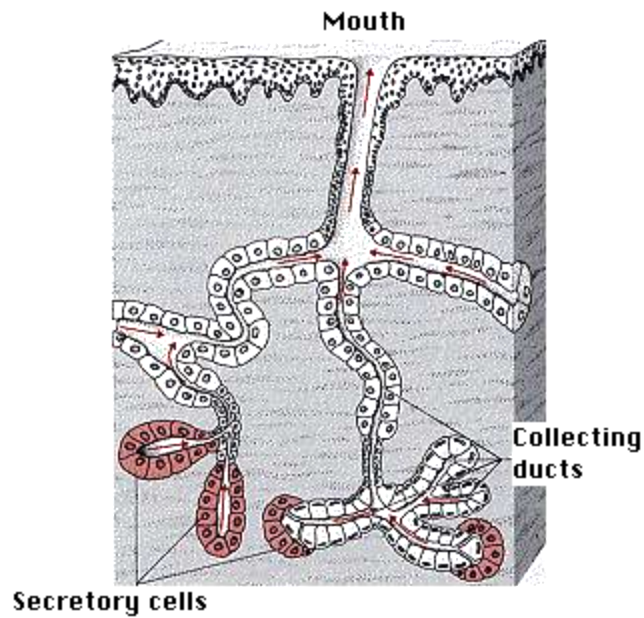
Gland	Hormones produced	Effect of Hormone
Pineal gland	Melatonin	Affects reproductive development and daily physiologic cycles.
Pituitary gland	Growth hormone	Controls growth of bones and muscles.
	Anti-diuretic hormone	Increases reabsorption of water in kidneys.
	Gonadotrophins	Controls development of ovaries and testes.
Thyroid gland	Thyroxine	Controls rate of metabolism and rate that glucose is used up in respiration, and promote growth.
Adrenal gland	Adrenaline	Prepares the body for emergencies; increases heart rate and rate and depth of breathing, raises blood sugar level so more glucose is available for respiration, diverts blood from gut to limbs.
Pancreas	Insulin	Converts excess glucose into glycogen in liver.
	Glucagon	Converts glycogen back to glucose in liver.
Ovaries	Oestrogen	Controls ovulation and secondary sexual characteristics.
	Progesterone	Prepares the uterus lining for receiving an embryo.
Testes	Testosterone	Controls sperm production and secondary sexual characteristics.
Thymus	Thymosin	Promotes production and maturation of white blood cells.

The Endocrine System

What are exocrine glands?

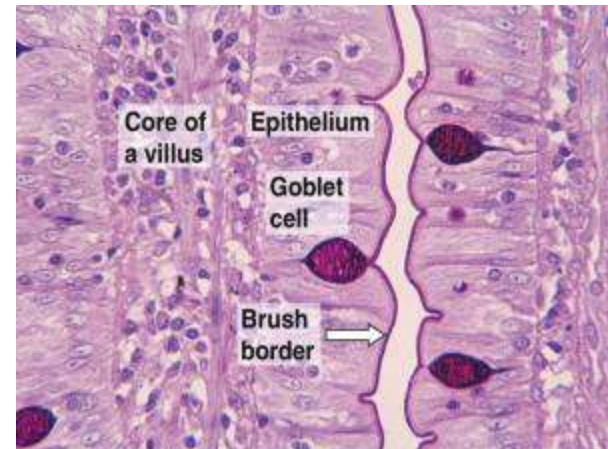
- Glands that discharge secretions by means of a duct, which opens onto an epithelial surface.
- Sweat, sebaceous, and mammary glands, and the glands that secrete digestive enzymes.
- Most glands in the body are exocrine types.

Exocrine glands are glands with ducts.



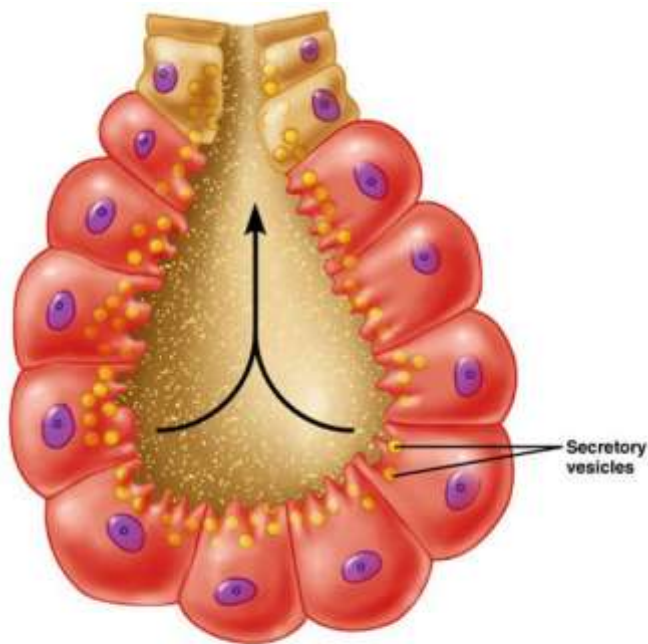
Goblet cell

- Unicellular exocrine gland



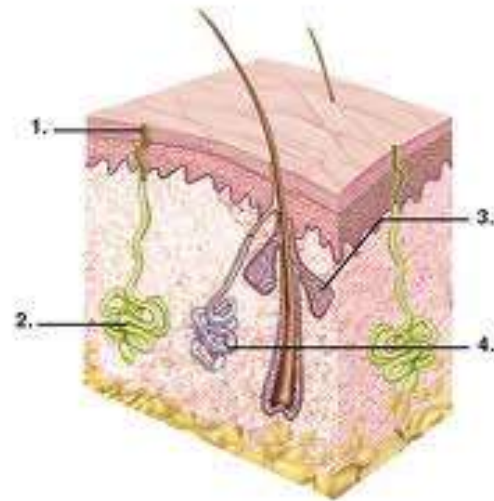
Merocrine gland

- Exocytosis
- Watery secretion



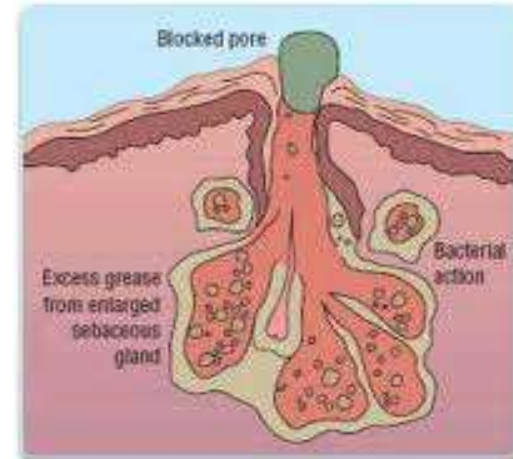
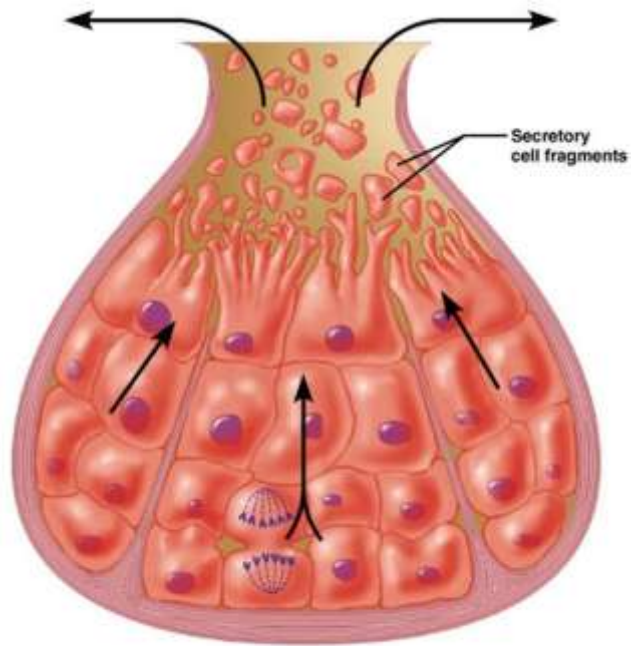
(a)

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Holocrine gland

□ Cell ruptures



(b)

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Apocrine gland

- Blister on surface releases contents

