The Endocrine system

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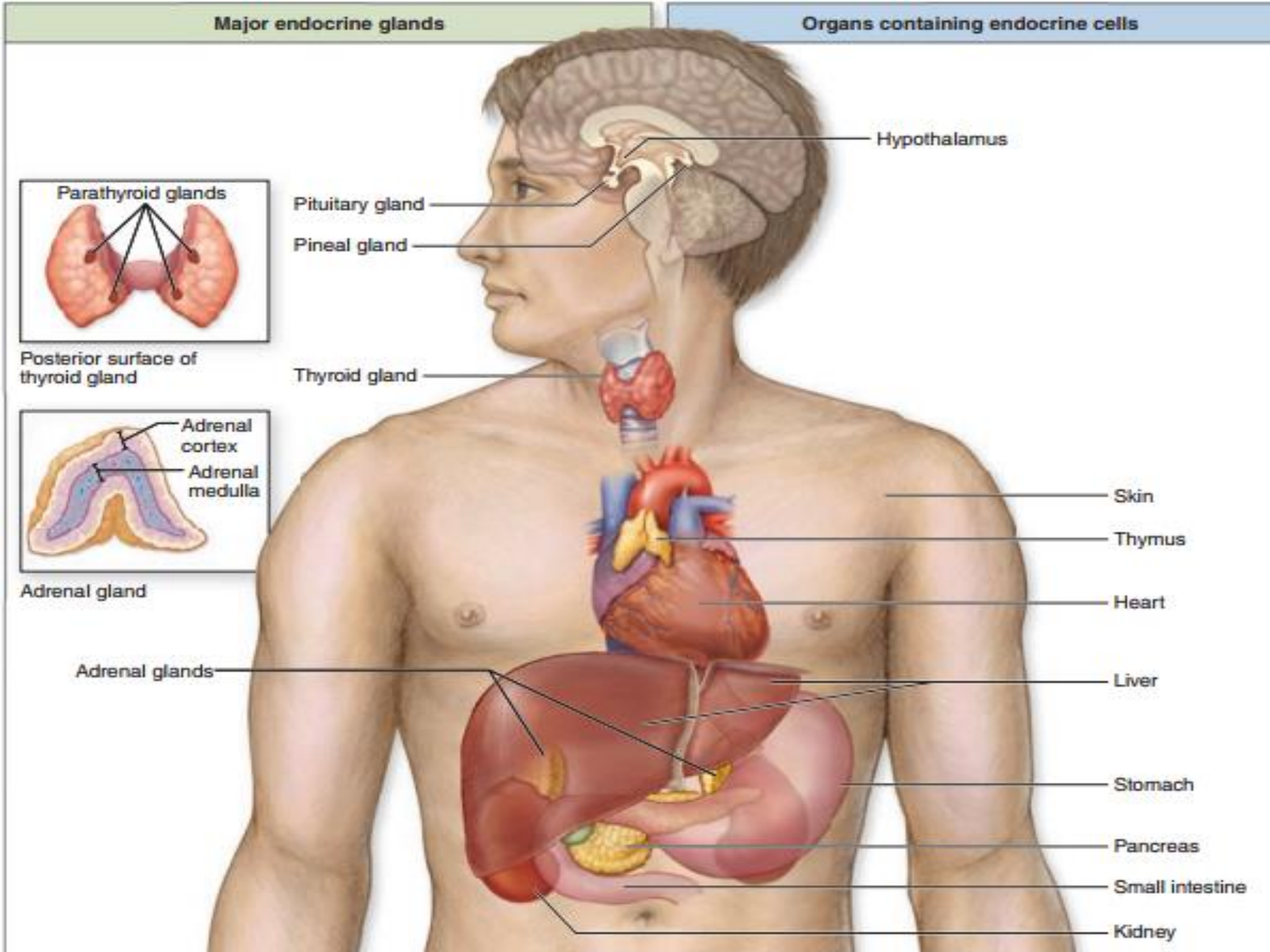
- Hormones are molecules that function as chemical signals
- Hormones are liberated by specialized cells called endocrine cells
- Endocrine cells aggregate as endocrine glands
- There are many isolated endocrine cells such those in the digestive system, heart, and kidney.
- The endocrine cells are very close to blood capillaries to distribute the hormones through out the organism.

- Tissues and organs on which the hormones act are called **target tissues** or **target organs.**
- Endocrine glands are also target organs to control body functions
- Endocrine system interacts closely with nervous system
- Hormones are frequently hydrophilic such as protein or peptides, or hydrophobic such as steroid and thyroid hormones


Major endocrine glands
Organs containing endocrine cells
Parathyroid glands
Posterior surface of thyroid gland
Adrenal cortex
Adrenal medulla
Adrenal gland
Hypothalamus
Pituitary gland
Pineal gland
Thyroid gland
Skin
Thymus
Heart
Adrenal glands
Liver
Stomach
Pancreas
Small intestine
Kidney

Pancreatic islets

- Are compact spherical or egg-shaped masses of endocrine tissue
- There are more than million islets in human pancreas
- Each islets consist of polygonal or rounded cells arranged in cords

The major hormones-producing islet cells are:

1- α or A cells secrete primarily glucagon and are usually located peripherally.

2- β or B cells produce insulin, are the most numerous, and are located centrally.

3- δ or D cells, secreting somatostatin, are scattered and much less abundant.

The immune system and lymphoid organs

- Immune system has the ability to distinguish self (the organism own molecules) from non-self (foreign substance)
- Has the ability to neutralize foreign molecules and destroy microorganisms or transplanted organs
- Some time immune system reacts against its own body tissue, causing autoimmune diseases

Cells of the immune system are:

- A- distributed throughout the body, in blood, lymph, epithelial tissue and connective tissue.
- B- arranged in small spherical nodules called lymph nodules found in connective tissue, in mucosa of digestive, respiratory and reproductive systems.
- C- organized in larger lymphoid organs such as the spleen, thymus and bone marrow

Lymphoid tissue

- Lymphoid tissue is a connective tissue with a rich supply of lymphocytes
- Lymphoid tissue are made of a rich network of reticular fiber of type 111 collagen
- Digestive, respiratory and reproductive tracts mucosal layers contain large collection of lymphocytes, IgA-secreting plasma and lymphoid nodules
- Examples of lymphoid organs are Tonsils, Appendix, Spleen, Bone marrow and Thymus.

Spleen

- The spleen is the largest lymphoid organ in the body
- Function of it:

1- Filtration of blood making it an important organ in defense against blood-born antigens

2- The main site of aged RBC destruction

3- Spleen is a production site of antibody

- Spleen is surrounded by capsule of dense connective tissue.

Thank you