

Endocrine System

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Describe the evolutionary importance and a brief description of development of this system.

- True endocrine glands most likely evolved later in the evolutionary history of the animal kingdom as separate, hormone-secreting structures.

Maintaining Homeostasis

- The endocrine system is important for maintaining homeostasis because many of the glands associated with the system are linked to neural control centers by homeostatic feedback mechanisms.
- Negative feedback, for example, decreases the deviation from an ideal normal value.

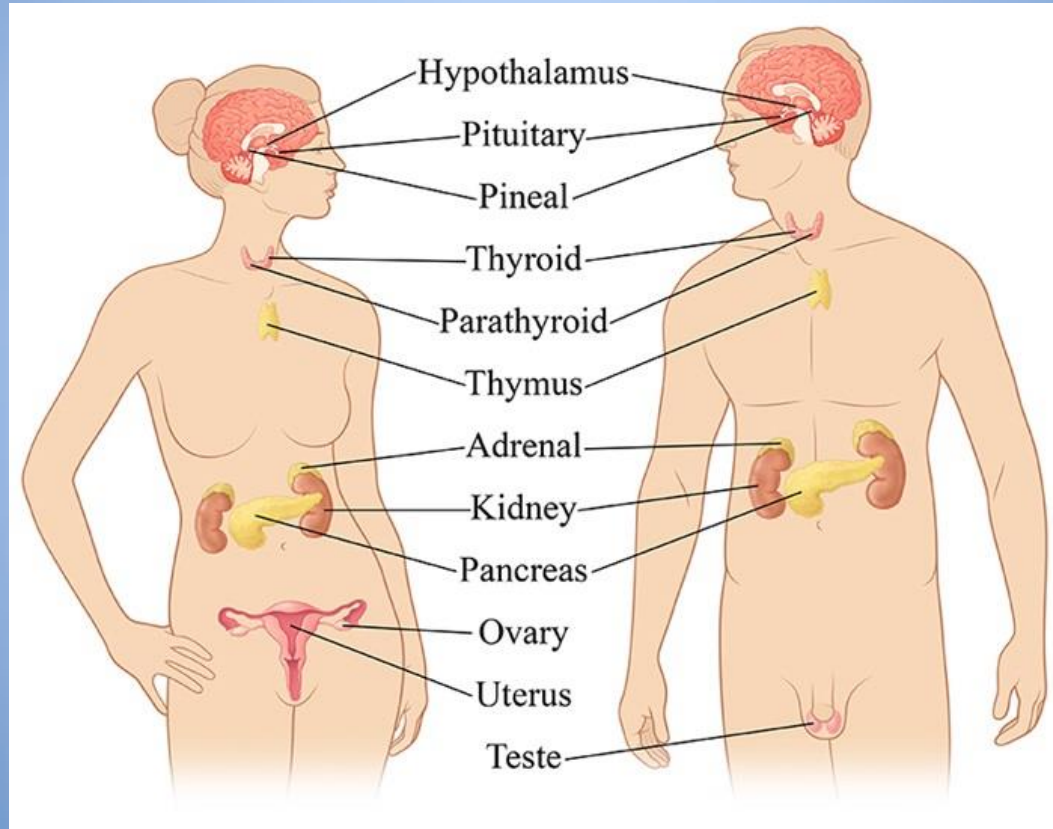
Function of the Endocrine System.

- Growth development
- Responses to stress and injury
- Reproduction
- Body energy levels
- Maintenance of the internal environment
- Bone and muscle strength

Structures of the Endocrine System

- Structures of the endocrine system are:
 - Pineal Gland - Produces melatonin which regulate the reproductive hormones.
 - Hypothalamus - Controls hormone production by releasing chemicals to the pituitary gland.
 - Pituitary Gland - Produces hormones which control other glands as well as various bodily functions. Involved in growth, mental development, and reproduction.
 - Thyroid Gland - Regulate the body's metabolism and calcium balance.
 - Parathyroid - Essential for proper bone development.
 - Thymus - Crucial to normal immune function in childhood.
 - Pancreas - Releases the insulin your body needs to metabolize sugar.
 - Adrenal Glands - Influence the way your body uses energy.
 - Testes - Produce the testosterone hormone in men.
 - Ovaries - produce estrogen and progesterone in women.

Structure of the Endocrine system.



Interdependence of this system with other body systems?

- Interdependence: all the systems need the other systems; they rely on each other for many different things and cannot function without the other.
 - The endocrine system and the nervous system control the actions of all the other body systems.

Major concepts of this system?

- Concepts include:
 - Negative and Positive Feedback
 - Hormone Secretion
 - Regulating the following:
 - Metabolism, growth and development, tissue function, sexual function, reproduction, mood or emotion, sleep, etc.

Diseases of the Endocrine System

Diabetes: this disease affects how the body regulates blood glucose levels. It can either make the body not produce enough insulin (type 1) or have the body not respond to insulin properly, causing an imbalance of glucagon.

Hypothyroidism: This disease is accumulated of hyaluronic acid within various body tissues that then gives off additional fluid retention due to reduced cardiac output and thermogenesis.

Turner Syndrome: This disease is genetic and can be inherited. This disease affects only females, either by removal or partial removal of one of their ovaries.

Signaling Molecules

- Signaling molecules trigger specific pathways by binding to specific receptor proteins in or on target cells.

Simple and Paired Pathways

- **Simple Pathway:** when endocrine cells are in this pathway, they respond directly to an internal or environmental stimulus by secreting a particular hormone.
- **Paired Pathway:** each pair provides a counterbalance for the other pathway, for example, regulation of blood glucose levels.

Positive feedback

- Positive feedback occurs when the rate of a process increases as the concentration of the product increases

Negative feedback

- The negative feedback occurs when the rate of the process decreases as the concentration of the product increases.
- Negative feedback controls the rate of a process to avoid accumulation of a product.

