



Short Communication

SIGNIFICANCE OF ENDOCRINE SYSTEM IN HUMAN BODY

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DESCRIPTION

The endocrine system works with the nervous system to control physical activities. The nervous system works through electrical impulses and neurotransmitters, causing muscle contraction and secretions from the glands. The effect is short-lived, measured and localized in seconds. The endocrine system functions through chemical messengers called hormones that influence growth, development, and metabolic activity. Endocrine effects are measured in minutes, hours, or weeks and are more common than nervous system effects.

There are two main types of glands in the body: exocrine glands and endocrine glands.

Exocrine Glands

The exocrine glands have tubes that transport secretory products to the surface. These glands include sweat glands, sebaceous glands, mammary glands, and glands that secrete digestive enzymes.

Endocrine Glands

The endocrine glands do not have ducts to carry the product to the surface. They transport through blood. The word endocrine is derived from the Greek terms “endo,” meaning within, and “krine,” meaning to separate or secrete. The secretory products of endocrine glands are called hormones and are secreted directly into the blood and then carried throughout the body where they influence only those cells that have receptor sites for that hormone.

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Chemical Nature of Hormones

Chemically, hormones are classified as either proteins or steroids. All of the hormones in the human body, except the sex hormones and those from the adrenal cortex, are proteins or protein derivatives.

Mechanism of Hormone

Action Hormones are carried by the blood throughout the entire body, yet they influence only certain cells. The specific cells that respond to a hormone have receptor sites for that hormone. This is known as a lock and key mechanism. If the key fits the lock, then the door will open. If a hormone fits the receptor site, then there will be an effect. If a hormone and a receptor site do not match, then there is no reaction [1-5].

All cells that have receptor sites for a particular hormone make up the target tissue for that hormone. In some cases, the target tissue is localized to a single gland or organ. In other cases, the target tissue will diffuse and scattered throughout the body, affecting many areas. Hormones have a unique effect on target cells by altering the activity of the cells. Protein hormones react with receptors on the cell surface, and the series of events leading to hormonal action is relatively rapid. Steroid hormones generally react with receptor sites inside a cell. Because this method of action actually involves synthesis of proteins, which is relatively slow.

Control of Hormone Action

Hormones are very potent substances, which mean that very small amounts of a hormone may have profound effects on metabolic processes. Because of their potency, hormone secretion must be regulated within very narrow limits in order to maintain homeostasis in the body.

Many hormones are controlled by some form of negative feedback mechanism. In this type of system, the gland is sensitive to the concentration of substances it regulates. Negative feedback

systems reverse the fluctuations in body condition to maintain stability or homeostasis. Some endocrine glands secrete hormones in response to other hormones. Hormones that promote the secretion of other hormones are called trophic hormones. Hormones from gland A cause gland B to secrete the hormone. The third way to regulate hormone secretion is direct nerve stimulation.

Endocrine Glands and Their Hormones

The endocrine system is made up of endocrine glands that secrete hormones. Although there are eight major endocrine glands scattered throughout the body, they are still considered as one system because they have similar functions, similar mechanism of influence, and many important interrelationships.

Some glands also have non-endocrine regions that have functions other than hormone secretion. For example, the pancreas has a major exocrine portion that secretes digestive enzymes and an endocrine portion that secretes hormones. The ovaries and testes secrete hormones and also produce the ova and sperm. Some organs, such as the stomach, intestines, and heart, produce hormones, but their primary function is not hormone secretion.

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