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Perspective

Endocrine System: Body's Prominent Regulator

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PERSPECTIVE

The endocrine system includes a variety of glands that synthesize and secrete hormones that the body uses for a variety of purposes. These regulate a variety of biological functions which includes respiration, metabolism, reproduction sensory perception movement sexual development and growth. Hormones are created by glands and delivered to the body's numerous tissues via the bloodstream. They convey messages to those tissues, instructing them on what they should do. When the glands do not generate enough hormones, illnesses emerge that can have a wide range of consequences. Although hormones circulate throughout the body, the Merck Manual adds that each type of hormone is targeted to specific organs and tissues. Organs with secondary endocrine activities, such as the kidney, liver, heart, and gonads, assist the endocrine system. Hormones like erythropoietin and renin, for example, are secreted by the kidney. The endocrine system is a messenger system that regulates distant target organs through feedback loops of hormones secreted by internal glands of an organism straight into the circulatory system. The hypothalamus is the neurological control center for all endocrine systems in animals. The thyroid gland and the adrenal glands are the two primary endocrine glands in humans. An axis is a group of glands that communicate with one another in a specific order, such as the hypothalamic-pituitary-adrenal axis. In addition to the specialist endocrine organs indicated above, many other organs that are part of other body systems, such as bone, kidneys, liver, heart, and gonads, have secondary endocrine activities. The endocrine system is made up of glands, which are organs that produce hormones. Glands manufacture and release a variety of hormones that target different parts of the body. Your body is covered in glands, including those in your neck, brain, and reproductive organs. Some glands are quite small, measuring approximately the size of a grain of rice or a pea. The pancreas, which is around 6 inches long, is the largest gland. The endocrine hormone erythropoietin, for example, is secreted by the kidney. Exocrine glands, which send hormones to the outside of the body, and paracrine signaling, which occurs between cells over a short distance, are examples of the endocrine system. Endocrine glands lack ducts, are vascular, and have intracellular vacuoles or granules where hormones are stored. Exocrine glands, such as salivary glands, sweat glands, and gastrointestinal glands, on the other hand, are less vascular and have ducts or a hollow lumen. Endocrine system plays an important role in the overall function of body. Endocrine alterations cause deterioration in endocrine function in older people, including decreased tissue responsiveness and hormone release from peripheral glands. This is accompanied by changes in the central processes that control the timing of hormone release, as well as a slowing of circadian hormonal and non-hormonal rhythms. This is one of the main reasons that at old age many prominent function of body system get disrupted. Multicellular organisms' evolution necessitated cell-to-cell communication in order to coordinate many physiological processes and maintain homeostasis. Historically, the neurological and endocrine systems were thought to perform complimentary functions in maintaining homeostasis. The endocrine system regulates and coordinates a variety of physiological processes like as development, reproduction, growth, internal environment maintenance, energy availability, and behavior. The endocrine system has been described from ancient times. Around 200 B.C., it was discovered. When the Chinese began separating sex and pituitary hormones from human urine and used them as medicine. Avicenna, a great scientist from ancient Persia, published a detailed account of diabetic mellitus in "The Canon of Medicine" detailing clinical symptoms such as aberrant hunger, collapse of sexual functions, and a sweet taste in the urine. Graves' disease was named after Irish physician Robert James Graves, who recorded a case of goitre with bulging eyes in 1835. Addison's disease (also known as primary adrenal deficit or hypocortisolism) was first described by Thomas Addison in 1849. Arnold Berthold, a pioneer in endocrinology, discovered that castration had a deleterious effect on male cockerels that did not develop sufficient sex-specific traits in the same year. Brown-Séquard, a professor at the College of France, later reported that self-administration of animal testes extracts improved his physical strength, mental capacity, and sexual potency, albeit his findings were not repeated by others. An endocrine system is present in most animals with well-developed neurological and circulatory systems. In vertebrates, the endocrine system consists of glands and diffuse cell groups dispersed across epithelial tissues. Endoderm, mesoderm, and ectoderm are the three germinal tissue layers from which endocrine glands grow; thus, the type of endocrine output produced is determined by the tissue layer in which the gland originated. Peptide and amine

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hormones are produced by ectodermal and endodermal glands, respectively. There are two types of endocrine glands: central and peripheral. The hypothalamus, pituitary, and pineal glands are central endocrine glands that are located within the cranium and are part of the brain. Peripheral glands are those that exist outside of the cerebral cavity. Primary and secondary endocrine organs are two types of endocrine glands. Primary endocrine organs are solely responsible for hormone secretion, whereas secondary endocrine organs are responsible for a variety of biological processes in addition to secreting hormones to support and maintain their primary functions. Only particular cell groups or tissue components in secondary endocrine organs would be dedicated to hormone secretion. Though the pancreas is a primary endocrine organ by definition, it is only partly endocrine because it only has a single cell group (Islets of Langerhans) dispersed along the entire length of the organ (mostly the tail part) that is endocrine; the rest of the pancreas is exocrine, secreting digestive enzymes that exit through ducts. Similarly, hypothalamus though considered as a primary endocrine organ, only neurons in the specific nuclear groups are endocrine.