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AN INTRODUCTION TO ENDOCRINE SYSTEM: ITS STRUCTURE AND FUNCTIONS

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DESCRIPTION

The endocrine system is a system of communication that employs feedback loops to regulate hormones produced into the circulatory system by internal glands of an organism in order to influence distant target organs. The hypothalamus regulates every endocrine system in animals on a neurological level. The major endocrine glands in people include the thyroid, parathyroid, pituitary, pineal, male and female testicles, and adrenal glands. The hypothalamus, pancreas, and thymus are endocrine glands in addition to their respective functions. Other organs, such as the kidneys, contribute to the endocrine system by secreting certain hormones. The endocrine system and its illnesses are the subject of endocrinology.

Structure

In contrast to ducts, where hormones are taken into the blood, endocrine glands directly release hormones into interstitial areas. The principal endocrine glands are the pineal gland, pituitary gland, pancreas, ovaries, testicles, thyroid, parathyroid, hypothalamus, and adrenal glands. The pituitary and hypothalamus are two examples of neuroendocrine organs.

The hypothalamus and anterior pituitary are two of the three endocrine glands that are essential for cell signaling. They are both a part of the HPA axis, which is recognized to be crucial for the cell signaling of the nervous system.

Hypothalamus: The hypothalamus is an essential control center for the autonomic nervous system. The three sets of endocrine outputs that make up the endocrine system are the parvocellular system, the autonomic intervention, and the magnocellular system. Magnocellular cells express oxytocin or vasopressin. The anterior pituitary's hormone release is controlled by the parvocellular.

Anterior pituitary: The production and release of tropic hormones is the main duty of the anterior pituitary gland. The anterior pituitary gland secretes a number of tropic hormones, including TSH, ACTH, GH, LH, and FSH.

Functions

The endocrine system produces hormones that regulate a variety of biological functions, including as metabolism, growth and development, sexual function, and mood. Hormones act as chemical messengers that go through the bloodstream to their target cells and organs and either stimulate or inhibit their function. The pancreas, ovaries, and testes are a few of the glands that make up the endocrine system, along with the pituitary, thyroid, and adrenal glands. Only a few of the health problems that can be brought on by endocrine system disorders include diabetes, infertility, and thyroid problems.

Hormones: In order to regulate physiology and behavior, every hormone in the hormone family is produced by cells in glands of multicellular organisms and transported by the circulatory system to distant organ destinations. Eicosanoids, steroids, and amines, peptides, and proteins-derivatives of amino acids and proteins—are the three main categories of chemical substances that make up hormones. The glands that secrete hormones make up the endocrine system. Occasionally, the definition of "hormone" is broadened to include chemicals produced by cells that affect autocrine or intracranial signaling inside the same cell.

Hormones alter distant cells' activity by binding to particular receptor proteins in the target cell. This might lead to responses particular to some cell types, like fast changes in the activity of already-present proteins or more gradual changes in the





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expression of the target genes. Whereas amino acid-based hormones are lipid-soluble and act on the surface of target cells through signal transduction pathways, steroid hormones pass through the plasma membranes of target cells to act within their nuclei.

Cell signaling: The most common mode of cell communication in the endocrine system is endocrine signaling, which involves leveraging the circulatory system to reach distant target organs. Signaling can take many different forms, including paracrine, autocrine, and neuroendocrine. The only mechanism for neurocrine signaling between neurons is the nervous system.

Autocrine: An autocrine agent, also known as a hormone or chemical messenger, is secreted by a cell and interacts with autocrine receptors on the same cell to affect the cell.

Paracrine: The paracrine system is categorized by some endocrinologists and medical professionals as a part of the endocrine system, despite disagreements. Paracrine effects have a longer half-life and target cells within the same tissue or organ. One example of this is the pancreatic hormone somatostatin, which is released by some pancreatic cells and targets other pancreatic cells.

Juxtacrine: Juxtacrine signaling is a type of intercellular communication that is sent by oligosaccharide, lipid, or protein components of a cell membrane. It may have an effect on both the emitting cell and the cells that are immediately adjacent to it. It occurs between cells that are in close proximity to one another and that have large sections of plasma membrane joined by transmembrane channels known as connexions. Usually, there are just 2 to 4 nm between each cell.

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