

Role of Pituitary Gland

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OPINION

The pituitary gland (hypophysis) is a pea-sized endocrine gland located near the base of your brain, behind the bridge of your nose, and directly beneath the hypothalamus. It is housed in the sella turcica, a sphenoid bone depression. The pituitary is known as the "master gland" because it not only secretes its own hormones but also instructs other glands to do so. The front (anterior) lobe and the back (posterior) lobe are the two primary portions of our pituitary gland. A stalk of blood vessels and nerves connects the hypothalamus and pituitary gland. The pituitary gland is responsible for regulating a variety of biological functions as well as managing hormone levels throughout the body. It is a pea-sized or cherry-sized growth at the base of the brain. The gland is securely protected in a small bony chamber of the skull, roughly in the centre of the head and level with the eyes. The hypothalamus connects with the anterior lobe via hormones and the posterior lobe by nerve impulses through that stalk. The hypothalamus, located above the pituitary gland, is the command center for some of your body's most basic functions. It communicates with your autonomic nerve system, which regulates blood pressure, heart rate, breathing, body temperature, sleep-wake cycle, and digestion. Because the pituitary gland is so crucial, whether it produces too many hormones (hyperpituitarism) or too few hormones (hypopituitarism), a lot can go wrong (hypopituitarism). Overproduction or underproduction can have a negative impact on metabolism, growth, blood pressure, sex functioning, and other bodily systems. Pituitary problems occur when the pituitary gland fails to operate as it should, most commonly due to a tumour, or aberrant cell proliferation. According to expert endocrinologists, one out of every five persons will develop a tumour in their pituitary gland (16 percent to 20 percent of the population). The tumours are usually noncancerous, which is a blessing. Pituitary gland cancer is a rare occurrence. The pituitary gland, together with the hypothalamus, which is part of the diencephalon, is responsible for controlling the involuntary (vegetative) nervous system. The balance of energy, heat, and water in the body is managed by this section of the nervous system, which encompasses things like body temperature, heartbeat, urination, sleep, hunger, and thirst. The pituitary gland also produces a number of hormones that either control or directly affect most of the other hormone glands in the body. The pituitary gland is divided into four sections, each with its unique set of functions.

Those four parts are anterior lobe, posterior lobe, the part that joins the two lobes (pars intermedia), pituitary stalk, which forms the connection to the diencephalon. The pituitary gland has a unique developmental history with a twofold origin that begins in the fourth week of foetal development. The anterior pituitary, also known as the adenohypophysis, is epithelial in origin and is derived from embryonic ectoderm, whereas the posterior pituitary, also known as the neurohypophysis, is neuroectoderm-derived. The pituitary gland's development can be divided into three stages such as formation of Rathke's pouch evagination of Rathke's pouch and cell proliferation cellular differentiation. It is a relatively flat sheet of tissue resting above the anterior pituitary in lungfish, but it gets increasingly well developed in amphibians, reptiles, and birds. In general, no species has a well-developed intermediate lobe, and birds have none at all. Apart from the lungfish, the pituitary gland in fish is generally different from that in other animals. In general, the intermediate lobe is well formed, and it can be as large as the rest of the anterior pituitary. In most circumstances, the posterior lobe produces a sheet of tissue at the base of the pituitary stalk and sends irregular finger-like projections into the tissue of the anterior pituitary, which is directly beneath it. Corticotrophs produce adrenocorticotrophic hormone, gonadotrophs produce luteinizing hormone or follicle-stimulating hormone, lactotrophs produce prolactin, somatotrophs produce growth hormone, and thyrotrophs produce thyrotropin, among other secretory cells in the avian anterior pituitary gland. There are also somatotolactotrophs that produce both GH and prolactin, as well as cells that co-express the big protein Pro-Opioid Melanin Cortin (POMC) and the LH, FSH, and TSH subunits. Blood vessels abound in the pars distalis, including the hypophyseal portal vessels. These latter provide a pathway to the anterior pituitary gland from the neurosecretory nerve terminals in the median eminence. Indeed, the anterior pituitary gland is controlled by releasing hormones (or hypothalamo-hypophysiotropic hormones) from the median eminence through the portal blood arteries. In essence, glands and hormones are a long chain of communication in the body. The hypothalamus provides messages to the pituitary gland in the form of hormones, instructing it on how much hormone to send to the other glands. The pituitary gland then secretes hormones that tell the glands how much hormone they should secrete. The pituitary gland also manufactures hormones for the body's organs. It generates Oxytocin stimulates contractions in the uterus and mammary glands, which aid in delivery and milk production, Antidiuretic hormone (vasopressin) for the

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kidneys, Beta-melanocyte-stimulating hormone is a hormone that causes the skin to darken, Endorphins are neurotransmitters that help the brain and immune system reduce pain and control the immune system, Hormones that promote muscle and bone growth, Enkephalins are brain chemicals that help to block pain sensations and prolactin is a hormone that increases the production of milk in

the mammary glands. The majority of hormones are released every one to three hours, following the body's circadian rhythm. This means hormone production peaks throughout the day and gradually decreases as night falls. Other hormones rely on certain conditions to influence production levels, such as the menstrual cycle.