

Posterior Pituitary

The posterior pituitary is an endocrine gland primarily composed of the nerve terminals of axons extending from the hypothalamus. It is important in the neuroendocrine reflex, which occurs when sensory neurons are stimulated resulting in action potential in hypothalamic cells and exocytosis of hormones from the posterior pituitary. Vasopressin is one of the hormones released from the posterior pituitary. Vasopressin is synthesized in the hypothalamus but stored in the posterior pituitary and released in response to synaptic input from osmoreceptors that detect increased osmolality of blood plasma. This hormone affects the kidney into retaining more water and also can constrict blood vessels. The second hormone released from the posterior pituitary is Oxytocin. It is released via a neuroendocrine reflex in response to stimulation of the nipples during breastfeeding that causes the mammary glands to contract and release milk. Stimulation of the nipples causes action potential generation in the oxytocin cells of the hypothalamus, which travels down to the nerve endings in the posterior pituitary and results in the exocytosis of Oxytocin. It also causes uterine smooth muscle contraction during the second and third stages of labor.



PLAY PICMONIC

Characteristics

Neuroendocrine Reflex Stimulation (By Hypothalamus)

Hippo-Thor Stimulating Neuron-leash

The neuroendocrine reflex describes how sensory neurons in the periphery become activated in response to certain stimuli, which then feedback to the hypothalamus and excite the hormone-releasing neurons which have their axon terminals in the posterior pituitary. Oxytocin and vasopressin are released in this way in response to various triggers. For example, an infant suckling at the mother's breast will cause sensory feedback to oxytocin-producing neurons in the posterior pituitary, resulting in oxytocin release by exocytosis from the nerve terminals.

Direct Hormones

Vasopressin

Vase-present

ADH (vasopressin) is secreted in response to increased blood osmolality and results in greater retention of water as well as constriction of blood vessels.

Increased Water Retention (In Kidneys)

Up-arrow Water in Kidney

ADH affects the kidney by stimulating water retention. This changes blood osmolality. It can also stimulate the arterioles into contracting which raises blood pressure.

Oxytocin

Octopus-toe

Oxytocin is a mammalian hormone that plays a role in sexual reproduction during and after childbirth.

Increased Uterine Contraction

Up-arrow Uterus Squeezed

Oxytocin coordinates contraction of uterine smooth muscle during the second and third stages of labor.

Mammary Glands Contraction

Breast-feeding

Oxytocin causes the mammary glands to contract and release milk in response to stimulation of the nipples during breastfeeding.