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, causing it to retain more water, and can also 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, causing 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.



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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 send 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 osmolarity 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 effect changes blood osmolarity. 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.

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