Ch 45.2 Notes

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Vocab

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Oxytocin: Neurohormone, from the posterior pituitary gland, causes contraction of mammary gland cells, forcing milk from reservoirs in the gland.

Negative Feedback: When the response reduces the initial stimulus. Like an AC unit.

Positive Feedback: Reinforces a stimulus, leading to an even greater response.

Hypothalamus: In vertebrates, coordination of endocrine signaling relies heavily on the \_\_\_\_.

Pituitary Gland: A gland located at the base of the hypothalamus, roughly the size and shape of a lima bean.

Posterior Pituitary: An extension of the hypothalamus Hypothalamic axons that reach into the \_\_\_ secrete neurohormones synthesized in the hypothalamus.

Anterior Pituitary: An endocrine gland that synthesizes and secretes hormones in response to hormones from the hypothalamus.

Prolactin: Has activities that include stimulating milk production.

Thyroid Hormone: Regulates bioenergetics; helps maintain normal blood pressure, heart rate, and muscle tone; and regulates digestive and reproductive functions.

Thyroid Gland: An organ in the neck consisting of two lobes on the ventral surface of the trachea.

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Notes

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Feedback regulation and coordination with the nervous system are common in hormone pathways

Simple endocrine pathway

* Endocrine cells respond DIRECTLY to stimulus
  + Secrete hormone
  + Hormone🡪 blood vessels to target
  + Hormone reaches target= signal transduction pathway

Simple neuroendocrine pathways

Stimulus received by sensory neuron (NOT endocrine tissue)

* Stimulates neurosecretory cell
* Secrete neurohormone
* Hormone into blood stream & travels to target

Feedback regulation

Negative feedback

* Response inhibits initial stimulus
* Typical of pathways involved in homeostasis

Positive feedback

* Response reinforces (makes more of) initial stimulus

Coordination of the endocrine and nervous systems

Hypothalamus

* Receives information from nerves
* Initiates neuroendocrine response
* Signals travel to pituitary gland
  + Posterior pituitary
    - Extension of hypothalamus
    - Hormones made in hypothalamus released here
  + Anterior pituitary
    - Endocrine gland
    - Synthesizes/secretes hormones in response to signals from hypothalamus

Posterior pituitary hormones

Neurosecretory cells of hypothalamus makes them and releases into PP

* Antidiuretic hormone (ADH)- regulates kidney function (increases water retention)
* Oxytocin- controls milk secretion in mammals and regulates uterine contractions during birthing

PP releases the hormones in response to nerve impulses from hypothalamus

Anterior pituitary hormones

Control metabolism, osmoregulation, reproduction

Many regulate endocrine glands/tissues

Hormones from hypothalamus control release of ALL AP hormones

* Each AP hormone controlled by at least one releasing hormone from the hypothalamus

Thyroid regulation: a hormone cascade pathway

Thyroid hormone- regulates bioenergetics (increases metabolism)

* Maintain normal BP, heart rate, muscle tone, digestive/reproductive functions

Thyroid

* Neck
* Two lobes

Hormonal Regulation of Growth

Growth hormone

* Secreted by AP
* Targets liver to secrete insulin-like growth factors
  + Stimulate bone and cartilage growth
  + Oppose effects of insulin (by raising blood-glucose levels)