

## Chapter 11 Endocrine System

### **Endocrine System:**

The endocrine system is made up of the cells, tissues, and organs that secrete hormones into body fluids such as the blood stream. What is its function?

What is the difference between an endocrine gland and an exocrine gland?

What is the tissue called that hormones affect?

### **Hormone Action:**

\_\_\_\_\_ hormones are lipid-soluble and can pass through cell membranes. Their receptors are located in the target cell's \_\_\_\_\_. The hormone-receptor complex binds with the \_\_\_\_\_ and activates specific \_\_\_\_\_ that, in turn, direct the synthesis of specific \_\_\_\_\_.

\_\_\_\_\_ hormones combine with receptors in target cell \_\_\_\_\_; The receptors have a \_\_\_\_\_ site and a/an \_\_\_\_\_ site.

The hormone-receptor complex (as first messenger) triggers a cascade of biological activity. What happens after the complex forms? What is the name of the most common second messenger?

Prostaglandins: are locally-produced lipids that affect the organ in which they are produced with a variety of effects.

What are some of these effects?

### **Control of Hormonal Secretions:**

There are several ways in which hormone release is very closely regulated. All of these mechanisms use negative feedback.

The hypothalamus regulates the \_\_\_\_\_ gland's release of hormones

The \_\_\_\_\_ system influences certain endocrine glands directly with nerve impulses.

Other glands respond directly to changes in the \_\_\_\_\_ fluid composition.

Explain in general how negative feedback works. How would this function in the above three situations?

### **Pituitary Gland:**

The pituitary gland is attached to the base of the brain and has a front lobe called the \_\_\_\_\_ and a rear lobe called the \_\_\_\_\_.

The brain controls the activity of the pituitary gland in two ways.

Releasing hormones from the \_\_\_\_\_ control the secretions of the anterior pituitary and are carried in the bloodstream by \_\_\_\_\_ veins.

The posterior pituitary releases hormones into the bloodstream in response to nerve impulses from the \_\_\_\_\_.

**Anterior Pituitary:**

The anterior pituitary consists mostly of \_\_\_\_\_ tissue arranged around blood vessels and enclosed in a capsule of collagenous \_\_\_\_\_ tissue.

How many hormones does it secrete? What function do most of them have in common?

Growth hormone GH: What is the function of GH?

What factors influence growth besides GH?

What hormones from the hypothalamus control the levels of GH?

What disorders may result from a lack of GH or too much GH?

Prolactin PRL: What is the function of PRL?

What is its target tissue?

What hypothalamic hormones affect it?

Thyroid stimulating hormone TSH: What is the function of TSH? (What is its target organ?)

What hypothalamic hormones affect its release?

How are these hormones from the hypothalamus regulated?

Adrenocorticotropic hormone ACTH: What is the target organ for ACTH? What hormone does it affect the release of?

What is the name of the hormone from the hypothalamus that controls ACTH's release?

Follicle stimulating hormone FSH: What are the target organs for FSH?

What effect does it have on the males? On females?

What hormone from the hypothalamus affects its release?

Luteinizing hormone LH: What does it do?

How is it different in males than in females?

What is its controlling hormone from the hypothalamus called?

<p><b>Posterior Pituitary:</b></p> <p>The posterior lobe consists of _____ fibers and supporting _____ cells arising in the hypothalamus.</p> <p>What structure actually produces the hormones released by the posterior pituitary?</p>
<p><u>Antidiuretic hormone ADH:</u> What is the function of this hormone?</p> <p>What disorder may result if enough ADH is not secreted?</p>
<p><u>Oxytocin:</u></p> <p>What are the functions of this hormone ?</p>
<p><b>Thyroid Gland:</b></p> <p>The thyroid gland is located below the _____ and consists of two broad _____ connected by an _____.</p> <p>The thyroid consists of secretory parts called _____ filled with hormone-storing _____.</p>
<p><u>Thyroxine T4:</u> How many iodines does it contain?</p> <p><u>Triiodothyronine T3:</u> How many iodines?</p> <p>What is the function of these two hormones?</p> <p>How does TSH affect their release? How do they affect the release of TSH?</p> <p>What is a goiter and what may cause one?</p>
<p><u>Calcitonin:</u> What is the function of this hormone?</p> <p>What part of the thyroid secretes it?</p>
<p><b>Parathyroid Glands:</b></p> <p>How many are there and where are they found?</p>
<p><u>Parathyroid hormone PTH:</u> What is the function of this hormone? How does it achieve this function? How is it related to calcitonin from the thyroid?</p>
<p><b>Adrenal Gland:</b></p> <p>The adrenal glands sit atop the _____ enclosed in a layer of _____.</p>
<p><u>Adrenal medulla:</u> The adrenal medulla is made up of modified _____ that are connected to the _____ nervous system.</p>

The hormones secreted are the same as neurotransmitters of this system but are called hormones because they are secreted into the \_\_\_\_\_.

Epinephrine & norepinephrine: What affect do these have on the body?

What are they secreted in response to?

Adrenal cortex: The adrenal cortex makes up most of the adrenal glands and consists of \_\_\_\_\_ cells in three layers: an outer, middle, and an inner zone. Several groups of hormones are secreted by the cortex.

Mineralocorticoids - aldosterone: This hormone controls the levels of \_\_\_\_\_ ions by conserving them in the \_\_\_\_\_. Why is this important?

Which zone secretes mineralocorticoids?

Glucocorticoids: These hormones influence the metabolism of glucose, protein, and fat in response to conditions that \_\_\_\_\_ the body and require a greater supply of \_\_\_\_\_ in the bloodstream.

How does negative feedback control the release of these hormones? What else can trigger their release?

Name an important glucocorticoid. Which zone secretes these hormones?

Sex hormones: Sex hormones, produced in the \_\_\_\_\_ zone, are mostly of the \_\_\_\_\_ type but can be converted to \_\_\_\_\_ hormones in the skin, liver, and adipose tissues.

These hormones supplement those released by the gonads and may stimulate early development of reproductive organs.

### **Pancreas:**

The pancreas secretes hormones as an \_\_\_\_\_ gland, and digestive juices to the digestive tract as an \_\_\_\_\_ gland. Where is the pancreas located?

Its endocrine portions are the islets of \_\_\_\_\_ that include two cell types-- \_\_\_\_\_ cells that secrete glucagon, and \_\_\_\_\_ cells that secrete insulin.

Glucagon \_\_\_\_\_ the blood levels of glucose by stimulating the breakdown of \_\_\_\_\_ and the conversion of noncarbohydrates into \_\_\_\_\_.

What controls the levels of glucagons in the blood?

Insulin \_\_\_\_\_ the blood levels of glucose by stimulating the liver to form \_\_\_\_\_ increasing \_\_\_\_\_ synthesis, and stimulating adipose cells to store \_\_\_\_\_.

What controls the blood levels of insulin?

**Pineal Gland:**

The pineal gland, near the upper portion of the thalamus, secretes \_\_\_\_\_-, which is involved in the regulation of \_\_\_\_\_ rhythms of the body.

**Thymus Gland:**

The thymus gland, lying between the lungs under the \_\_\_\_\_, secretes \_\_\_\_\_ that affect production and differentiation of T lymphocytes that are important in \_\_\_\_\_.

**Reproductive Glands:**

The ovaries produce what two hormones?

What does the placenta produce?

The testes produce \_\_\_\_\_.

**Digestive Glands Other Hormone Producing Organs:**

The digestive glands secrete hormones associated with the processes of digestion.

The \_\_\_\_\_ secretes atrial natriuretic peptide affecting sodium and the kidneys secrete \_\_\_\_\_ for blood cell production.

**Stress:**

Factors that serve as stressors to the body produce stress and threaten \_\_\_\_\_.

Stress may be physical, psychological, or some combination of the two.

What effects on the body does physical stress have?

What does psychological stress result from?

Responses to stress are designed to maintain homeostasis.

The \_\_\_\_\_ controls the general stress syndrome, which involves increased sympathetic activity and increased secretion of which hormones?