Chapter 26: Hormones and the Endocrine System

Guided Reading Activities

Big idea: The nature of chemical regulation

Answer the following questions as you read modules 26.1–26.3:

1. In order for your cells to coordinate with each other, they rely on two organ systems: the ______________ system and the ______________ system.

2. Complete the following table, which compares the features of signaling in the endocrine and nervous systems.

<table>
<thead>
<tr>
<th></th>
<th>Endocrine system signaling</th>
<th>Nervous system signaling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of transmission</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed of transmission</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of transmission</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Both endocrine and nervous system signaling is specific. Briefly explain how this is accomplished in each type of signaling.

4. List the three stages of signaling using hormones.

5. True or false: Only lipid-soluble hormones use a signal transduction pathway. If false, make it a correct statement.
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6. Complete the Venn diagram comparing water-soluble hormones to lipid-soluble hormones.

Water-soluble hormones  Lipid-soluble hormones

7. What two effects did atrazine, a common chemical in weed killer, have on male frogs?

8. Briefly explain the point of studies that examine the effects of the chemicals in weed killers on frogs.

Big idea: The vertebrate endocrine system

Answer the following questions as you read modules 26.4–26.5:

1. What are three ways in which endocrine glands can be stimulated to release a hormone?

2. Match the following gland to the product it secretes or its effect: thyroid gland, pineal gland, parathyroid glands, adrenal glands, and pituitary gland.

   Secretes melatonin: ________________________

   Raises calcium levels: ________________________

   Requires iodine in trace amounts to produce its hormones: ________________________

   Helps the kidneys to retain water through the release of ADH: ________________________

   Releases epinephrine: ________________________

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3. True or false: Only specialized endocrine glands secrete hormones. If false, make it a correct statement.

4. The ________________ is the connection between the endocrine and nervous systems.

5. Which pituitary lobe actually makes endocrine hormones and which one simply stores them?

6. What roles do the neurosecretory cells of the hypothalamus have in regulating function of the pituitary gland?

**Big idea: Hormones and homeostasis**

Answer the following questions as you read modules 26.6–26.12:

1. Insufficient iodine in the diet can lead to a condition known as a(n) ____________.

2. Complete the following table, which compares hypothyroidism to hyperthyroidism.

<table>
<thead>
<tr>
<th></th>
<th>Hypothyroidism</th>
<th>Hyperthyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Symptoms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cause</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. True or false: The gonads produce gametes and sex hormones. If false, make it a correct statement.

4. Complete the following table, which compares the different types of human sex hormones.

<table>
<thead>
<tr>
<th></th>
<th>Estrogens</th>
<th>Progestins</th>
<th>Androgens</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description (including an example of each)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Present in males or females</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Some female bodybuilders take anabolic steroids, which are synthetic versions of testosterone. Briefly explain why these women usually develop male characteristics.

6. The pancreas secretes the hormones ____________________ and ____________________.

7. Refer to the graph on page 526 of your textbook. What likely caused the glucose levels to spike at 8 a.m.?

8. Briefly explain how glucagon and insulin are antagonistic hormones. Your answer should include their effects.

9. True or false: All forms of diabetes result in elevated levels of glucose in the blood. If false, make it a correct statement.

10. Do diabetics need to regulate their starch intake? Briefly explain your answer either way.

11. A mutation in a person’s DNA leads to nonfunctioning insulin receptors on the surfaces of his or her cells. Briefly explain what the consequence of this mutation.

12. Which of the following hormones is responsible for stimulating the adrenal cortex to release corticosteroids?
   a. ACTH
   b. Adrenaline
   c. Mineralcorticoids
   d. Noradrenaline

13. Briefly compare the different effects the hormones of the adrenal medulla have versus the hormones of the adrenal cortex on the human stress response.
14. Each kidney has a(n) ____________________ that sits on top of it; this gland is made of two parts called the ____________________ and the ____________________.

15. How does PRL lead to increased milk supply in female humans?

16. Which portion of the pituitary releases oxytocin? Was the oxytocin made there? Briefly explain your answer.

**CONNECTING THE BIG IDEAS**

Use your knowledge of the information contained within this chapter’s “Big Ideas” to answer this question.

A parent wants to inject their son with additional HGH during puberty to increase his chances of playing professional basketball. Would administration of HGH during puberty increase a person’s height beyond what their normal height without the additional HGH would have been?