Chapter 39 Exercises

Review Questions

1. A newly discovered hormone contains four amino acids linked together. Under which chemical class would this hormone be classified?
- **a.** lipid-derived hormone
- **b.** amino acid-derived hormone
- **c.** peptide hormone
- **d.** glycoprotein

2. Which class of hormones can diffuse through plasma membranes?
- **a.** lipid-derived hormones
- **b.** amino acid-derived hormones
- **c.** peptide hormones
- **d.** glycoprotein hormones

3. Why are steroids able to diffuse across the plasma membrane?
- **a.** Their transport protein moves them through the membrane.
- **b.** They are amphipathic, allowing them to interact with the entire phospholipid.
- **c.** Cells express channels that let hormones flow down their concentration gradient into the cells.
- **d.** They are nonpolar molecules.

4. A new antagonist molecule has been discovered that binds to and blocks plasma membrane receptors. What effect will this antagonist have on testosterone, a steroid hormone?
- **a.** It will block testosterone from binding to its receptor.
- **b.** It will block testosterone from activating cAMP signaling.
- **c.** It will increase testosterone-mediated signaling.
- **d.** It will not affect testosterone-mediated signaling.

5. What effect will a cAMP inhibitor have on a peptide hormone-mediated signaling pathway?
- **a.** It will prevent the hormone from binding its receptor.
- **b.** It will prevent activation of a G protein.
- **c.** It will prevent activation of adenylate cyclase.
- **d.** It will prevent activation of protein kinases.

6. When insulin binds to its receptor, the complex is endocytosed into the cell. This is an example of _____ in response to hormone signaling.
- **a.** cAMP activation
- **b.** generating an intracellular receptor
- **c.** activation of a hormone response element
- **d.** receptor down-regulation

7. Drinking alcoholic beverages causes an increase in urine output. This most likely occurs because alcohol _____.
- **a.** inhibits ADH release
- **b.** stimulates ADH release
- **c.** inhibits TSH release
- **d.** stimulates TSH release

8. FSH and LH release from the anterior pituitary is stimulated by _____.
- **a.** TSH
- **b.** GnRH
- **c.** T_3
- **d.** PTH

9. What hormone is produced by beta cells of the pancreas?
- **a.** T_3
- **b.** glucagon
- **c.** insulin
- **d.** T_4

10. When blood calcium levels are low, PTH stimulates _____.
- **a.** excretion of calcium from the kidneys
- **b.** excretion of calcium from the intestines
- **c.** osteoblasts
- **d.** osteoclasts

11. How would mutations that completely ablate the function of the androgen receptor impact the phenotypic development of humans with XY chromosomes?
- **a.** Patients would appear phenotypically female.
- **b.** Patients would appear phenotypically male with underdeveloped secondary sex characteristics.
- **c.** Patients would appear phenotypically male but could not produce sperm.
- **d.** Patients would express both male and female secondary sex characteristics.

12. A rise in blood glucose levels triggers release of insulin from the pancreas. This mechanism of hormone production is stimulated by _____.
- **a.** humoral stimuli
- **b.** hormonal stimuli
- **c.** neural stimuli
- **d.** negative stimuli

13. Which mechanism of hormonal stimulation would be affected if signaling and hormone release from the hypothalamus were blocked?
- **a.** humoral and hormonal stimuli
- **b.** hormonal and neural stimuli
- **c.** neural and humoral stimuli
- **d.** hormonal and negative stimuli

14. A scientist hypothesizes that the pancreas's hormone production is controlled by neural stimuli. Which observation would support this hypothesis?
- **a.** Insulin is produced in response to sudden stress without a rise in blood glucose.
- **b.** Insulin is produced in response to a rise in glucagon levels.
- **c.** Beta cells express epinephrine receptors.
- **d.** Insulin is produced in response to a rise in blood glucose in the brain.

15. Which endocrine glands are associated with the kidneys?
- **a.** thyroid glands
- **b.** pituitary glands
- **c.** adrenal glands
- **d.** gonads

16. Which of the following hormones is not produced by the anterior pituitary?
- **a.** oxytocin
- **b.** growth hormone
- **c.** prolactin
- **d.** thyroid-stimulating hormone

17. Recent studies suggest that blue light exposure can impact human circadian rhythms. This suggests that blue light disrupts the function of the _____ gland(s).
- **a.** adrenal
- **b.** pituitary
- **c.** pineal
- **d.** thyroid

Critical Thinking Questions

18. Although there are many different hormones in the human body, they can be divided into three classes based on their chemical structure. What are these classes, and what is one factor that distinguishes them?

19. Where is insulin stored, and why would it be released?

20. Glucagon is the peptide hormone that signals for the body to release glucose into the bloodstream. How does glucagon contribute to maintaining homeostasis throughout the body? What other hormones are involved in regulating the blood glucose cycle?

21. Name two important functions of hormone receptors.

22. How can hormones mediate changes?

23. Why is cAMP-mediated signal amplification not required in steroid hormone signaling? Describe how steroid signaling is amplified instead.

24. Name and describe a function of one hormone produced by the anterior pituitary and one hormone produced by the posterior pituitary.

25. Describe one direct action of growth hormone (GH).

26. Researchers have recently demonstrated that stressed people are more susceptible to contracting the common cold than people who are not stressed. What kind of stress must the infected patients be experiencing, and why does it make them more susceptible to the virus?

27. How is hormone production and release primarily controlled?

28. Compare and contrast hormonal and humoral stimuli.

29. Oral contraceptive pills work by delivering synthetic progestins to a woman every day. Describe why this is an effective method of birth control.

30. What does aldosterone regulate, and how is it stimulated?

31. The adrenal medulla contains two types of secretory cells; what are they, and what are their functions?

32. How would damage to the posterior pituitary gland affect the production and release of ADH and inhibiting hormones?