Endocrine System

Required:

1. Indicate what defines a chemical signal as a hormone, and what determines the target tissues(s) for a specific hormone.

2. Describe the chemical classification of hormones. List examples in each category.

3. Explain the direct gene activation mode of action of hydrophobic hormones (e.g. steroids and thyroid hormones).

4. Describe the second messenger hypothesis mode of action of hydrophilic hormones (e.g. peptides and catecholamines).

5. Describe four ways in which hormonal secretion may be regulated by the nervous system.

6. Describe the importance of negative feedback in regulating hormone secretion.

7. List and describe the locations of the major endocrine glands. Name the major hormones produced by each gland.

8. Understand that some hormones (e.g. leptin) are secreted by cells that are not organized into distinct glands. Describe additional examples.

9. Describe the parts of the pituitary gland (anterior and posterior) and the relationship between the pituitary gland and the hypothalamus.

10. Describe what is meant by the term trophic in describing some anterior pituitary hormones.

11. Describe the homeostatic control mechanism involving ADH from the posterior pituitary.

12. Describe how the hypothalamus regulates secretion of the posterior pituitary hormones.

13. Describe how release of pituitary TSH and ACTH are regulated by the hypothalamus and list the primary effects of each hormone.

14. Describe the production and actions of thyroid hormone and explain how thyroid hormone's secretion is regulated.

15. Describe the location of the parathyroid glands and explain the homeostatic mechanism by which PTH regulates blood calcium levels.

16. Describe the actions of cortisol and the homeostatic control mechanism involving stress and cortisol.

17. Describe the actions of the catecholamines released by the adrenal medulla, and explain how release of these hormones is regulated.

18. Describe the respective roles of catecholamines and cortisol in the general stress response.

19. Describe the homeostatic control mechanisms by which insulin and glucagon from the islets of Langerhans in the pancreas regulate blood glucose.

Note A homeostatic control mechanism includes the receptor, integrating center, and effectors controlling a regulated variable. The most useful way of learning about specific hormones is to learn how the hormone functions as part of a control mechanism.

20. Describe and give examples of the following types of hormone interactions: permissive effect, synergistic effect, and antagonistic effects.

21. Describe what is meant by "up and down" regulation in hormone action.