Name _____ **Period** _____

Ms. Foglia **Date** _____

AP: CHAPTER 45: CHEMICAL REGULATION & COMMUNICATION
HORMONES AND THE ENDOCRINE SYSTEM

1. List a few similarities and differences comparing:

   a. endocrine system _____

   _____

   b. nervous system _____

   _____

2. Define negative feedback. _____

   _____

   _____

3. Define positive feedback. _____

   _____

   _____

4. How do the <u>steroid model</u> and the <u>protein model</u> for hormone action differ?

   _____

   _____

5. Hormone and receptor interactions are based on _____

6. Give an example of paracrine signaling between cells.

   _____

   _____

7. Identify cell structures used for direct cell contact in:

   a. animal cells _____

   _____

   b. plant cells _____

   _____

8. List the three stages of cell signaling and where each usually occurs.

   a. _____

   b. _____

   c. _____

9. What is a ligand? _____

   _____

   _____

10. What do G-proteins-receptors do when activated?

    _____

    _____

11. What do tyrosine-kinase receptors do within a cell when activated?

    _____

    _____

12. What happens when a ligand-gated channel is stimulated?

    _____

    _____

13. List three models for ligand/receptor interactions.

_____

_____

_____

14. How can steroid hormones initiate cell signaling?

_____

_____

15. What is the advantage of the phosphorylation cascade?

_____

_____

16. Identify molecules that serves as “second messengers” in a cell?

_____

_____

17. What does the “second messenger” do in the cell? _____

_____

_____

18. List the sequence of steps from signal molecule to cell response that involve calcium and calmodlin.

_____

_____

_____

_____

19. Describe a typical cellular response to a cell signaling pathway.

_____

_____

20. How do duct and ductless glands differ? _____

_____

_____

21. What stimulates the anterior pituitary? _____

_____

_____

22. Elaborate on the role of the hypothalamus. _____

_____

_____

23. What are the functions of the glands:

a. thyroid _____

_____

b. parathyroid _____

_____

24. What happens when there is an iodine deficiency?

_____

_____

25. Describe the function of the thymus gland.

_____

_____

26. How does the pancreas regulate blood sugar?

a. insulin _____

_____

b. glucagon _____

_____

27. What are the two mechanisms that stimulate the adrenal gland?

_____

_____

28. Describe several actions caused by the release of epinephrine.

_____

_____

29. What is the role of the gonadotropic hormones in males and females?

a. FSH _____

_____

b. LH _____

_____

30. What hormones are responsible for the secondary sex traits in males and females?

_____

Table 45.1 Major Vertebrate Endocrine Glands and Some of Their Hormones (Hypothalamus – Parathyroid glands)

Gland	Hormone	Chemical Class	Representative Actions	Regulated By
Hypothalamus	Hormones released by the posterior pituitary and hormones that regulate the anterior pituitary (see below)			
Pituitary gland Posterior pituitary (releases hormones made by hypothalamus)	Oxytocin	Peptide	Stimulates contraction of uterus and mammary gland cells	Nervous system
	Antidiuretic hormone (ADH)	Peptide	Promotes retention of water by kidneys	Water/salt balance
Anterior pituitary	Growth hormone (GH)	Protein	Stimulates growth (especially bones) and metabolic functions	Hypothalamic hormones
	Prolactin (PRL)	Protein	Stimulates milk production and secretion	Hypothalamic hormones
	Follicle-stimulating hormone (FSH)	Glycoprotein	Stimulates production of ova and sperm	Hypothalamic hormones
	Luteinizing hormone (LH)	Glycoprotein	Stimulates ovaries and testes	Hypothalamic hormones
	Thyroid-stimulating hormone (TSH)	Glycoprotein	Stimulates thyroid gland	Thyroxine in blood; hypothalamic hormones
	Adrenocorticotropic hormone (ACTH)	Peptide	Stimulates adrenal cortex to secrete glucocorticoids	Glucocorticoids; hypothalamic hormones
Thyroid gland	Triiodothyronine (T_3) and thyroxine (T_4)	Amine	Stimulate and maintain metabolic processes	TSH
	Calcitonin	Peptide	Lowers blood calcium level	Calcium in blood
Parathyroid glands	Parathyroid hormone (PTH)	Peptide	Raises blood calcium level	Calcium in blood

Table 45.1 Major Vertebrate Endocrine Glands and Some of Their Hormones (Pancreas – Thymus)

Gland	Hormone	Chemical Class	Representative Actions	Regulated By
Pancreas	Insulin	Protein	Lowers blood glucose level	Glucose in blood
	Glucagon	Protein	Raises blood glucose level	Glucose in blood
Adrenal glands Adrenal medulla	Epinephrine and norepinephrine	Amine	Raise blood glucose level; increase metabolic activities; constrict certain blood vessels	Nervous system
Adrenal cortex	Glucocorticoids	Steroid	Raise blood glucose level	ACTH
	Mineralocorticoids	Steroid	Promote reabsorption of Na^+ and excretion of K^+ in kidneys	K^+ in blood
Gonads Testes	Androgens	Steroid	Support sperm formation; promote development and maintenance of male secondary sex characteristics	FSH and LH
Ovaries	Estrogens	Steroid	Stimulate uterine lining growth; promote development and maintenance of female secondary sex characteristics	FSH and LH
	Progesterone	Steroid	Promotes uterine lining growth	FSH and LH
Pineal gland	Melatonin	Amine	Involved in biological rhythms	Light/dark cycles
Thymus	Thymosin	Peptide	Stimulates T lymphocytes	Not known