

Name _____

Period _____

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 steroid model and the protein model for hormone action differ?

5. Hormone and receptor interactions are based on _____

6. Give an example of paracrine signaling between cells.

Name _____

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?

Name _____

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.

Name _____

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?

Name _____

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
	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
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