

13. What does erythropoietin (EPO) do? (10.5) **K/U**
- It increases muscle mass and strength.
  - It decreases fat and improves muscle mass.
  - It increases red blood cells that carry more oxygen.
  - It makes steroids difficult to detect.
14. What is the general term for the male sex hormones? (10.7) **K/U**
- estrogens
  - thymosins
  - androgens
  - prostaglandins
15. Which hormone stimulates the beginning of the ovarian cycle? (10.7) **K/U**
- gonadotropin-releasing hormone
  - estrogen
  - follicle-stimulating hormone
  - luteinizing hormone

**Indicate whether each statement is true or false. If you think the statement is false, rewrite it to make it true.**

16. Protein hormones consist of amino acid chains, which range in length from 3 amino acids to more than 200 amino acids. (10.1) **K/U**
17. Protein hormones have an affinity for water and diffuse well through the blood and intercellular fluids. (10.1) **K/U**
18. Neurohormones are produced by neurons in the hippocampus. (10.2) **K/U**
19. Thyroid hormones lower the levels of  $K^+$  ions in the blood, thus inhibiting the ongoing release of calcium from bone. (10.2) **K/U**
20. Type 1 diabetes is caused by an inability to produce insulin due to a failure of the beta cells in the islets of Langerhans. (10.3) **K/U**
21. Treatment of diabetes requires constant monitoring of the blood calcium level. (10.3) **K/U**
22. Frederick Banting and Charles Best knew from the work of earlier scientists that a healthy dog would contract diabetes if its thyroid was removed. (10.4) **K/U**
23. Long-term use of synthetic steroids can lead to baldness, shrinking testes, irregular reproductive cycles, and many other physical and psychological side effects. (10.5) **K/U**
24. Natural steroid hormones in the human body control both male and female sexual development and reproduction, the adrenal fight-or-flight response, and the level of blood glucose. (10.5) **K/U**
25. Reproduction is controlled by sex hormones, which are primarily produced in the adrenal glands. (10.7) **K/U**
26. Spermatogenesis is controlled by the male androgen hormone aldosterone. (10.7) **K/U**
- Match each term on the left with the most appropriate description on the right.**
27. (a) insulin (i) increases fatty acid metabolism and amino acid uptake by the body  
 (b) oxytocin  
 (c) thyroxin  
 (d) calcitonin  
 (e) growth hormone (ii) regulates the metabolism of the body  
 (f) adrenocorticotropic hormone (ACTH) (iii) stimulates the adrenal cortex
- (iv) causes the uterus to contract for birth and the breasts to lactate  
 (v) speeds up the removal of sugar from the bloodstream  
 (vi) lowers  $Ca^{2+}$  levels in the blood (10.2, 10.7) **K/U**
28. (a) chorionic gonadotropin (i) predominantly female sex hormones, including progesterone  
 (b) testosterone (ii) glands responsible for the production of sex hormones, as well as egg and sperm cells  
 (c) progestins  
 (d) spermatogenesis (iii) monthly cycle of events in sexually mature females that prepares the uterus for the implantation of an egg  
 (e) menstrual cycle (iv) principal androgen  
 (f) gonads (v) process by which sperm cells are produced in the testes from precursor cells  
 (vi) hormone in blood or urine that is the basis of pregnancy tests (10.7) **K/U**

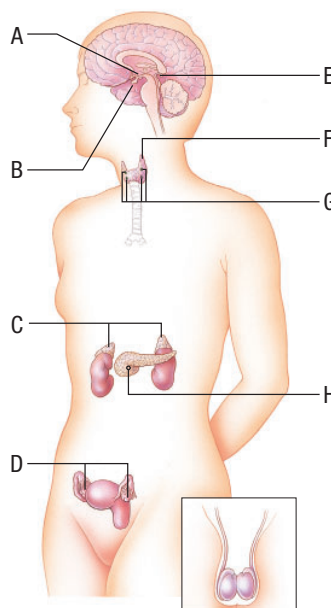
**Write a short answer to each question.**

29. Give examples of how an endocrine gland differs from an exocrine gland. (10.1) **K/U**
30. (a) What are the two methods in which hormones bind to receptor cells?  
 (b) How is the method of binding determined? (10.1) **K/U**
31. (a) Identify the gland in the human body that requires iodine to function properly, and explain why.  
 (b) If there is not enough iodine in the diet, what happens to this gland? (10.2) **K/U**

32. Which group of hormones of the adrenal glands regulates the metabolism of carbohydrates, proteins, and fats? (10.2) **K/U**
33. Explain the relationship between the secretion of parathyroid hormone and each of the following: (10.2) **K/U**
- calcium level in the blood
  - calcium absorption
34. (a) Where is the pineal gland located?  
(b) What is its function? (10.2) **K/U**
35. List four hormones that are involved in controlling the rate at which sugar is broken down (catabolized). (10.3) **K/U**
36. Describe the symptoms of hyperglycemia. (10.3) **K/U**
37. (a) What is gestational diabetes?  
(b) How does it differ from type 1 and type 2 diabetes? (10.3) **K/U**
38. Is testosterone a natural hormone or a synthetic hormone? Explain your answer. (10.5) **K/U**
39. What is a masking agent? (10.5) **K/U**
40. Explain the difference between an ovum and a zygote. (10.7) **K/U**

## Understanding

41. What components make up the endocrine system? (10.1) **K/U**
42. Explain the significance of insect juvenile hormone, in terms of its role in an organism. (10.2) **K/U**
43. Identify the major hormones of the anterior pituitary gland, and list their target organs or tissues. (10.2) **K/U**
44. Create your own chart, table, or diagram to list the various hormones of the endocrine system and summarize where they come from, how they act, and how they affect the body. (10.2) **K/U C**
45. Epinephrine is released into the bloodstream when the body is stressed. List four effects that epinephrine may have on the body once it has been released into the bloodstream. (10.3) **K/U**
46. Explain how parathyroid hormone (PTH) and calcitonin assist in blood ion regulation. (10.3) **K/U**
47. Describe how the hypothalamus and the pituitary gland work together. (10.3) **K/U**
48. Select the letter in **Figure 1** that best describes each statement below. Record your answers in your notebook. You may need to use some letters more than once. (10.1, 10.2, 10.3, 10.7) **K/U**

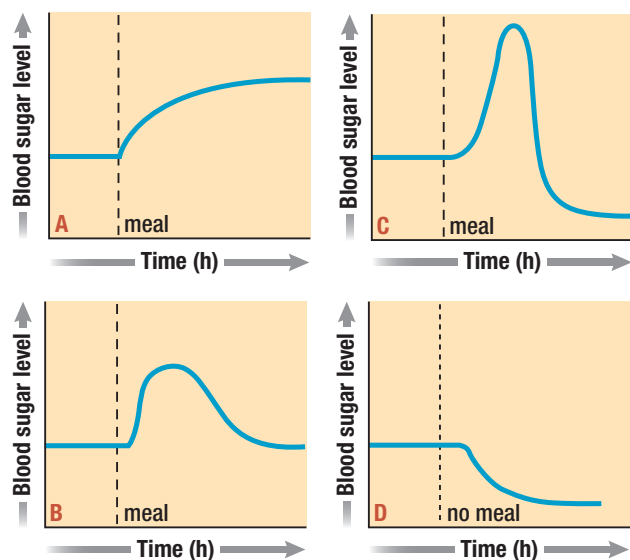


**Figure 1**

- gland that produces and releases insulin
  - gland that is responsible for primary calcium regulation
  - gland that controls biological rhythms
  - glands that produce hormones that, in turn, stimulate other glands to produce hormones
  - gland that produces progesterone and is regulated by GnRH
  - production site of the hormone that is involved in milk production
  - production site of the hormone that controls water balance by increasing the permeability of nephrons to water
  - site from which oxytocin is released
49. Secondary sexual characteristics develop in both genders after puberty. (10.7) **K/U**
- List three secondary sexual characteristics for males.
  - List three secondary sexual characteristics for females.
  - Which hormone controls the development of secondary sexual characteristics?

## Analysis and Application

50. Hormone A binds to intracellular receptors in a tissue and, as a result, the tissue is now sensitive (or responsive) to hormone B. Explain what has happened. (10.1) [K/U](#) [T/I](#)
51. Hormones are classified as either protein or steroid. They are also classified as tropic or non-tropic. Compare and contrast tropic and non-tropic hormones. (10.1) [K/U](#) [T/I](#)
52. (a) The endocrine system is considered to be an integrative system in the body. Explain why.  
(b) What other body system would also be considered integrative? (10.1) [K/U](#) [T/I](#) [A](#)
53. The pituitary gland has been referred to as the “master gland.” Write a brief paragraph to explain why you agree or disagree with this analogy. (10.2) [K/U](#) [T/I](#) [C](#)
54. The blood glucose levels of four people were followed over time. Three of the people ate a meal. The results are shown in the graphs in **Figure 2**. Use **Figure 2** to answer the following questions and explain your answer for each. (10.3) [K/U](#) [T/I](#) [A](#)



**Figure 2**

- (a) Which graph shows the results for someone who is suffering from diabetes mellitus? Explain your answer.
- (b) Which graph shows the results for someone who has too little glucagon? Explain your answer.
- (c) Which graph shows the results for someone who has a normally functioning pancreas? Explain your answer.
55. Diabetes is a disease that can be controlled if certain measures are taken. (10.3) [K/U](#) [T/I](#)
- (a) Explain why most people with diabetes must reduce the amount of carbohydrates they consume.
- (b) What potential complications do diabetics face if they do not control their diabetes?
56. Suppose that you are doing an experiment to gain a better understanding of the effects of pancreatic radiation on the blood glucose level of lab mice. You do the following:
- expose two mice to radiation for 50 min, measuring their blood glucose level every 10 min
  - test the blood glucose level of a lab mouse that did not receive any radiation over the same time periods
  - collect the data in **Table 1** (10.3) [K/U](#) [T/I](#) [C](#)

**Table 1** Blood Glucose Level (BGL) of Mice (g/100mL)

Blood glucose level	Exposure to radiation (min)					
	0	10	20	30	40	50
young male mouse exposed to radiation (g/100 mL)	0.09	0.18	0.23	0.28	0.28	0.28
old female mouse exposed to radiation (g/100 mL)	0.13	0.17	0.22	0.27	0.32	0.33
young female mouse not exposed to radiation (g/100mL)	0.09	0.10	0.09	0.08	0.09	0.10

- (a) Suggest a hypothesis for this experiment.
- (b) What variables were being tested?
- (c) Based on the information available, what variables do you think were controlled?
- (d) Describe any trends you observe in the data.
- (e) Create an appropriate graph to best report the data.
- (f) What conclusion can you draw from the data?
- (g) Based on the results, what effect do you think radiation might have on the pancreas?
- (h) What could be done to make this experiment more valid? Explain.
57. During pregnancy, the placenta produces progesterone. Is this an advantage or a disadvantage for women? Explain your reasoning. (10.7) [K/U](#)