

Name: _____

AP Biology

Chapter 32 Active Reading Guide

Homeostasis and Endocrine Signaling

Section 1

1. What is a tissue?
2. Explain the difference between animals that are regulators and those that are conformers.
3. What is interstitial fluid?
4. The example in the text is related to temperature regulation. Would ectotherms be regulators or conformers?
5. Throughout the text, a common theme has been regulation of homeostasis by feedback loops. We discuss feedback loops again as we look at hormone levels. What is meant by a set point?
6. Describe an example of a negative feedback loop. Clearly identify the set point, the stimulus, and the response.
7. We sometimes say that in negative feedback “more gets you less,” and in positive feedback “more gets you more.” Describe an example of a positive feedback loop.
8. What is thermoregulation?

9. Describe the difference between endothermy and ectothermy, and give an animal that exhibits each.

| Property | Description | Example |
|------------|-------------|---------|
| Endothermy | | |
| Exothermy | | |

10. What are the four processes by which heat is exchanged with the environment?
11. Heat loss in extremities is reduced by countercurrent exchange. Explain how countercurrent exchange works.
12. What is the role of the hypothalamus in temperature regulation?

Section 2

13. What is a hormone?
14. Why does a hormone elicit a response only with target cells?
15. The body has two long-distance regulating systems. Which involves chemical signals by hormones?
16. What is the other major communication and control system?
17. Explain the difference between an endocrine gland and an exocrine gland. Give an example of each.

18. Recall that target cells have receptors for specific hormones. Where are the receptors for lipid soluble hormones found?
19. Where are the receptors for the water-soluble proteins found? Explain this difference for the two types of hormones.
20. What endocrine gland secretes epinephrine?
21. One hormone can have several different effects. For example, epinephrine can cause the release of glucose from liver cells, dilate blood vessels to skeletal muscles, and constrict intestinal blood vessels. All these effects prepare the body for “fight or flight.” Explain how these multiple effects are possible.

Section 3

22. Define these two terms.
osmoregulation:

excretion:
23. Why are nitrogenous wastes associated with nucleic acids and proteins, but not with lipids or carbohydrates?
24. Notice the slight switch in terms when dealing specifically with osmolarity.
 - a. Explain water movement in an isoosmotic condition.
 - b. When two solutions differ in osmolarity, in which direction does water flow?
25. Explain the difference between osmoconformers and osmoregulators.
26. Why do many organisms have a body fluid composition adapted to the salinity of their environment?

27. Animals excrete nitrogenous wastes as _____, _____ or _____.

28. Describe the characteristics of the following nitrogenous waste molecules and the animal groups that excrete them.

ammonia:

urea:

uric acid:

29. The basic process of excretion usually requires four steps. Explain the four processes in Figure 32.17.

1.

2.

3.

4.

30. Draw the human kidney (use Figure 32.19), and label the renal medulla, renal cortex, and renal pelvis.

31. What is a nephron?
32. What is the key function of juxtamedullary nephrons?
33. Before going to the next concept, it is important to understand the process of filtration. Explain where and how filtration occurs. Finally, describe what the filtrate contains.
34. The process of converting blood filtrate to urine requires five steps as shown in Figure 32.20. Explain the key processes that occur in each step.
- 1.
 - 2.
 - 3.
 - 4.
 - 5.
35. Figure 32.21 in the text shows the increasing osmolarity of the kidney, moving from cortex to outer medulla to inner medulla. Why does the kidney expend great energy to maintain this gradient?
36. What is a countercurrent multiplier system?

37. Explain the role of antidiuretic hormone (ADH) in maintaining blood osmolarity.
38. Your knowledge of biology from previous chapters should make understanding how ADH works easy to understand. Describe the four steps of ADH action.