University of Arizona
182 INTRODUCTORY BIOLOGY
Spring 2010
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Practice Worksheet
Lecture 1 : Animal Form, Function, and Regulation

Corresponding sections in Biological Science (Freeman, 3rd ed.)

Chapter 41 : 41.2, 41.3, 41.4, 41.5
Chapter 44 : 44.5 (= 44.4 in Freeman 2nd ed.)
Chapter 47 : 47.1, 47.2, 47.4

Review important information

1. We have described six levels of organization in the animal body. Can you name them ?
2. What are the four types of tissues ?
3. What kind of tissue is bone ? blood ?
4. What do we call homeostasis ?
5. How can we classify animal species with respect to temperature regulation ?
6. Describe the negative feedback that regulates our temperature.
7. How do endotherms produce non-shivering heat ?
8. Are hormones chemical or electrical signals ?
9. How do hormones transmit information ?
10. What are endocrine glands ? Name three of them.
11. What are the three main groups of molecular structure found in hormones ?
12. Review how epinephrine works. Can you summarize the signal transduction cascade triggered by epinephrine ?
13. What are the two circulatory systems that move extracellular fluid in our body ?
14. Explain the role of osmotic pressure in moving extracellular fluid around the body.
15. Blood circulatory system in birds and mammals is organized in two completely seperate circuits. Can you name them ?
16. Review how blood flows through the human heart.
17. Can you define systole and diastole ?
18. Why does the heart beat ?
19. What are the six main components of blood ?
20. What do we call hematocrit ?

Test your knowledge

Q1. *There are _____ types of tissues. Match the following forms and some of their main functions.*

1. Epithelium
2. Connective tissue
3. Muscle tissue
4. Nervous tissue

A. Electrical transport
B. Liner
C. Support, padding, chemical transport
D. Motion

Q2. *There is wide variation in mechanisms of temperature regulation in animals. Match the following types of temperature regulation with their definition, and give examples.*

1. An **endotherm** (‘inner-heat’)…
2. An **ectotherm** (‘outer-heat’)…
3. An **homeotherm** (‘alike-heat’)…
4. An **heterotherm** (‘different-heat’)…

A. …relies principally on heat gained from the environment. _____ is an example.
B. …allows its body temperature to rise or fall depending on environmental conditions. _____ is an example.
C. …produces adequate heat to warm its own tissues. _____ is an example.
D. …keeps its body temperature constant. _____ is an example.

Q3. *Which of the following best describes the **set point** of a homeostatic system?*
A. The cells that collect and transmit information about the state of the system.
B. The cells that receive information about the state of the system and that direct changes to the system.
C. The various components that produce appropriate changes in the system.
D. The target or “normal” value of the parameter in question.

Q4. *How do biologists measure an animal’s metabolic rate?*
A. by taking its temperature
B. by measuring how rapidly it uses oxygen
C. by measuring how rapidly it uses glucose
D. by measuring how rapidly it produces wastes

Q5. *As a first step in triggering a specific response from a target cell, a hormone derived from an amino acid residue would do which of the following?*
A. bind with a cell-surface receptor
B. bind with a free receptor molecule in the bloodstream
C. bind with a receptor inside the cell
D. be capable of any of the above functions

Q6. *Which is an accurate summary of the epinephrine signal transduction cascade resulting in the release of millions of glucose molecules?*
A. Epinephrine is a second messenger that binds to the target cell surface and is copied millions of times, resulting in glucose release.
B. The second messenger cAMP transmits signal from the cell surface to the signaling cascade, which in each subsequent step activates many more molecules, eventually resulting in glucose release.
C. Epinephrine is a steroid that easily enters cells and binds to the DNA, which it causes to replicate repeatedly, eventually resulting in glucose release.
D. Epinephrine inhibits the production of cyclic adenosine monophosphate while amplifying its own signal, eventually resulting in release of glucose.

Q7. *Match the following blood components and functions.*
1. Plasma proteins
2. Erythrocytes
3. Platelets
4. Leukocytes

A. Clotting
B. Transport oxygen and carbon dioxyde
C. Destroy foreign cells, produce antibodies
D. Osmotic balance