

The Human Body Worksheets

CK12 Editor

Say Thanks to the Authors

Click <http://www.ck12.org/saythanks>

(No sign in required)

AUTHORS

CK12 Editor

To access a customizable version of this book, as well as other interactive content, visit www.ck12.org

CK-12 Foundation is a non-profit organization with a mission to reduce the cost of textbook materials for the K-12 market both in the U.S. and worldwide. Using an open-content, web-based collaborative model termed the **FlexBook®**, CK-12 intends to pioneer the generation and distribution of high-quality educational content that will serve both as core text as well as provide an adaptive environment for learning, powered through the **FlexBook Platform®**.

Copyright © 2012 CK-12 Foundation, www.ck12.org

The names “CK-12” and “CK12” and associated logos and the terms “**FlexBook®**” and “**FlexBook Platform®**” (collectively “CK-12 Marks”) are trademarks and service marks of CK-12 Foundation and are protected by federal, state, and international laws.

Any form of reproduction of this book in any format or medium, in whole or in sections must include the referral attribution link <http://www.ck12.org/saythanks> (placed in a visible location) in addition to the following terms.

Except as otherwise noted, all CK-12 Content (including CK-12 Curriculum Material) is made available to Users in accordance with the Creative Commons Attribution/Non-Commercial/Share Alike 3.0 Unported (CC BY-NC-SA) License (<http://creativecommons.org/licenses/by-nc-sa/3.0/>), as amended and updated by Creative Commons from time to time (the “CC License”), which is incorporated herein by this reference.

Complete terms can be found at <http://www.ck12.org/terms>.

Printed: August 12, 2012

flexbook
next generation textbooks



CHAPTER 1

The Human Body Worksheets

CHAPTER OUTLINE

- 1.1 Organization of the Human Body
 - 1.2 Homeostasis and Regulation
 - 1.3 References
-

Chapter 19: The Human Body

- Lesson 19.1: Organization of the Human Body
- Lesson 19.2: Homeostasis and Regulation

1.1 Organization of the Human Body

Lesson 19.1: True or False

Name_____ Class_____ Date_____

Write true if the statement is true or false if the statement is false.

- _____ 1. In most multicellular organisms, not all cells are like.
- _____ 2. Each specialized cell has a specific function in the body.
- _____ 3. Every cell in the body originated from a single fertilized egg.
- _____ 4. A cell that is able to differentiate into all cell types within a body is called pluripotent.
- _____ 5. Human adult stem cells cannot be isolated from a tissue sample, such as bone marrow.
- _____ 6. Though the sponge is a large organized, multicellular structure, its cells are not organized into true tissues.
- _____ 7. Epithelial tissue is made up of layers of tightly packed cells.
- _____ 8. Your skin is the smallest organ in your body.
- _____ 9. One of the functions of the integumentary organ system is for movement.
- _____ 10. Leukocytes are among the structures involved in the immune system.

Lesson 19.1: Reading Comprehension

Name_____ Class_____ Date_____

Read this passage from the text and answer the questions that follow.

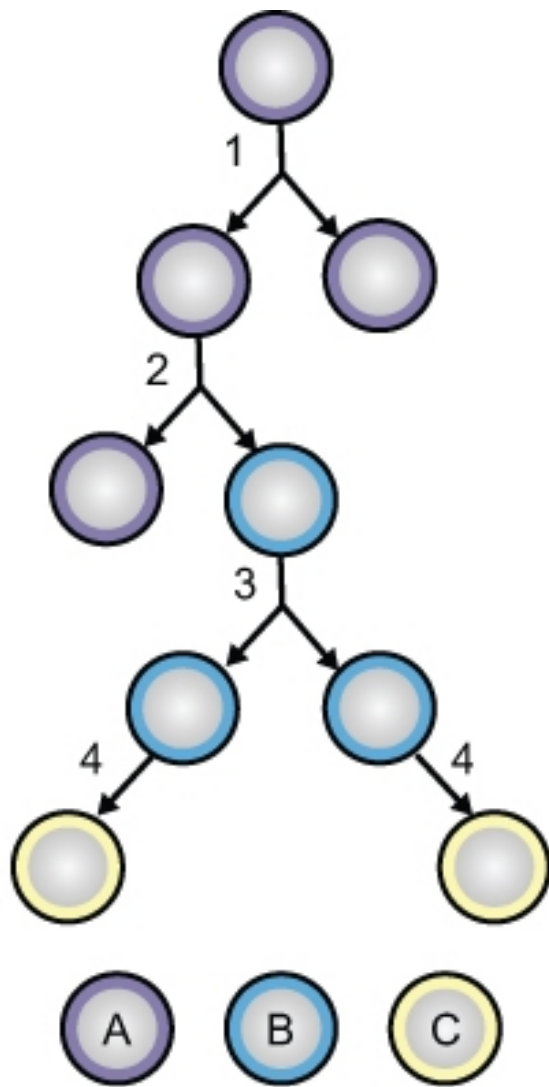
Cells

Stem Cells

An unspecialized cell that can divide many times and give rise to different, specialized cells is called a **stem cell**, as shown in **Figure 1**. Zygotes and embryonic cells are both types of stem cells. The stem cells found in embryos can divide indefinitely, can specialize into any cell type and are called **embryonic stem cells**. Embryonic stem cells are totipotent. Undifferentiated cells that are found within the body and that divide to replace dying cells and damaged tissues are called adult stem cells. **Adult stem cells** can divide indefinitely, and generate all the cell types of the organ from which they originate. They can potentially re-grow the entire organ from just a few cells. A third type of stem cell is found in blood from the umbilical cord of a new-born baby, and the placenta. These “cord blood stem cells” are considered to be adult stem cells because they cannot generate all body cell types, just different types of blood cells. Therefore, adult stem cells and cord blood stem cells are pluripotent.

Stem Cells in Medicine

Stem cells are of great interest to researchers because of their ability to divide indefinitely, and to differentiate into many cell types. Stem cells have many existing or potential therapeutic applications. Such therapies include treatments for cancer, blood disorders, brain or spinal cord injuries, and blindness.

**FIGURE 1.1**

Division and differentiation of stem cells into specialized cells.

A–Embryonic stem cells (purple)

B–adult stem cell (blue)

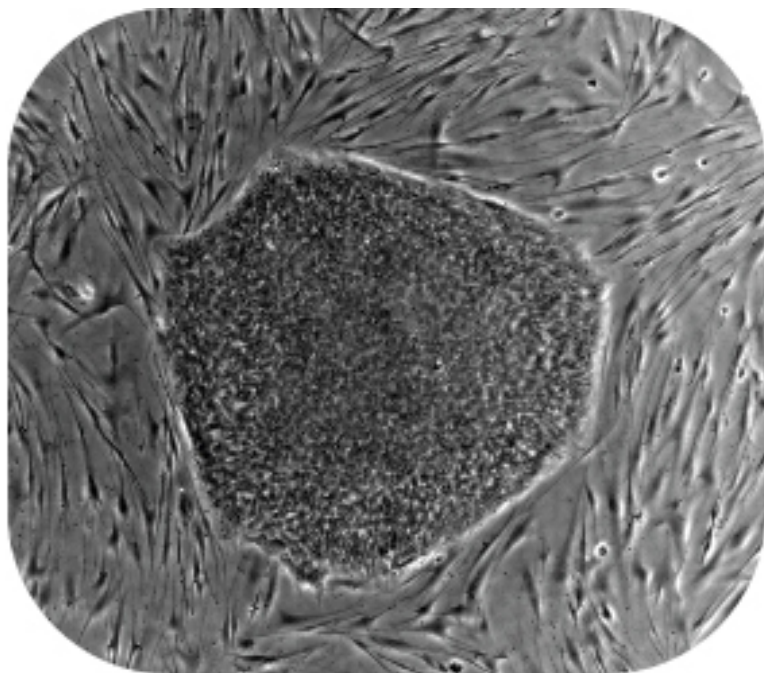
C–differentiated cell (yellow)

1–embryonic stem cell division to make more stem cells

2–totipotent embryonic stem cells can produce pluripotent adult stem cells

3–adult stem cells divide, and eventually differentiate into specialized cells. (4)

Embryonic stem cells, as shown in **Figure 2**, are taken from eggs that were fertilized in the laboratory and donated to research. They may have the greatest potential because they are totipotent, and thus have the most potential medical applications. However, embryonic stem cells harvested from a donated embryo differ from a potential patient's tissue type. Therefore, just as in organ transplantation, there is a risk of a patient's body rejecting transplanted embryonic stem cells. Some individuals and groups have objections to the harvesting of embryonic stem cells, because harvesting the stem cells involves the destruction of the embryo. Some researchers are looking into methods

**FIGURE 1.2**

Human embryonic stem cell colony, which was grown in a laboratory on a feeder layer of mouse cells. Embryonic stem cells are totipotent.

to extract embryonic stem cells without destroying the actual embryo. Other researchers have claimed success in harvesting embryonic stem cells from the embryonic fluid that surrounds a growing fetus.

Adult stem cells, including cord blood stem cells, have already been used to treat diseases of the blood such as sickle-cell anemia and certain types of cancer. Unlike embryonic stem cells, the use of adult stem cells in research and therapy is not controversial because the production of adult stem cells does not require the destruction of an embryo. Adult stem cells can be isolated from a tissue sample, such as bone marrow, from a person. Scientists have recently discovered more sources of adult stem cells in the body. Adult stem cells have been found in body fat, the inside lining of the nose, and in the brain. Some researchers are investigating ways to revert adult stem cells back to a totipotent stage.

Questions

1. What is the definition of a stem cell?

-
-
-

2. What can adult stem cells replace?

-
-
-

3. What is the main difference between embryonic and adult stem cells?

-
-
-

4. Name two ways in which researchers could harvest embryonic stem cells without destroying the actual embryo.

-
-
-

5. Name one source of adult stem cells in the human body.

-
-
-

Lesson 19.1: Multiple Choice

Name _____ Class _____ Date _____

Circle the letter of the correct choice.

- a. A cell that is able to differentiate into all cell types is called
 - a. pluripotent
 - b. differentiated
 - c. totipotent
 - d. none of the above
- b. Adult stem cells
 - a. can divide indefinitely
 - b. can generate all the cell types of the organ from which they originate
 - c. can potentially re-grow the entire organ from just a few cells
 - d. all of the above
- c. A third type of stem cell is found in
 - a. the placenta
 - b. the liver
 - c. the pancreas
 - d. the heart
- d. Muscle tissue is made up of
 - a. neurons
 - b. fat cells
 - c. cells that contain contractile filaments
 - d. none of the above
- e. One of the structures involved in the respiratory system is the
 - a. lymph node
 - b. pharynx
 - c. pancreas
 - d. adenoids
- f. Providing cells with _____ and _____ is an extremely important function.
 - a. blood, oxygen
 - b. oxygen, nutrients

- c. air, blood
- d. air, oxygen
- g. The largest organ in the body is (are) the _____.
 - a. heart
 - b. muscles
 - c. bones
 - d. skin

Lesson 19.1: Vocabulary

Name _____ Class _____ Date _____

Match the vocabulary term with the correct definition Terms.

- ____ 1. differentiation
- ____ 2. organ system
- ____ 3. tissue
- ____ 4. muscle tissue
- ____ 5. pluripotent
- ____ 6. organ
- ____ 7. connective tissue
- ____ 8. epithelial tissue
- ____ 9. stem cell
- ____ 10. cells

Definitions

- a. the most basic units of life in your body
- b. a group of connected cells that have a similar function within an organism
- c. layers of tightly packed cells that line the surfaces of the body for protection, secretion, and absorption
- d. a cell able to differentiate into many cell types, but not all
- e. process by which an unspecialized cell divides many times to produce specialized cells that work together and make up the body
- f. an unspecialized cell that can divide many times and give rise to different, specialized cells
- g. cells that contain contractile elements that move past each other and change the size of the cell
- h. a group of organs that act together to carry out complex interrelated functions
- i. made up of many different types of cells that are all involved in structure and support of the body
- j. structure made of two or more tissues that work together for a common purpose

1.2 Homeostasis and Regulation

Lesson 19.2: True or False

Name _____ Class _____ Date _____

Write true if the statement is true or false if the statement is false.

- _____ 1. The release of hormones into the blood is caused by a response.
- _____ 2. Control of blood glucose level is an example of positive feedback.
- _____ 3. One of the homeostatic processes of chemical regulation is the release of insulin and glucagon into the blood
- _____ 4. Cell toxicity is one cause of disease and cellular malfunction
- _____ 5. Insulin replacement therapy is not used to bring the body's handling of glucose back into balance
- _____ 6. The blood of an anemic woman will have increased oxygen-carrying capacity.
- _____ 7. Genes are sometimes turned off or on due to external factors which we have some control over.
- _____ 8. Physical activity is essential for proper functioning of our cells and bodies.
- _____ 9. Medications cannot help balance the amount of mood-altering chemicals within the brain.
- _____ 10. When a person takes too much of a drug that affects the central nervous system, basic life functions are disrupted.

Lesson 19.2: Reading Comprehension

Name _____ Class _____ Date _____

Read this passage from the text and answer the questions that follow.

Disruption of Homeostasis

Many homeostatic mechanisms keep the internal environment within certain limits (or set points). When the cells in your body do not work correctly, homeostatic balance is disrupted. Homeostatic imbalance may lead to a state of disease. Disease and cellular malfunction can be caused in two basic ways: by deficiency (cells not getting all they need) or toxicity (cells being poisoned by things they do not need). When homeostasis is interrupted, your body can correct or worsen the problem, based on certain influences. In addition to inherited (genetic) influences, there are external influences that are based on lifestyle choices and environmental exposure. These factors together influence the body's ability to maintain homeostatic balance. The endocrine system of a person with diabetes has difficulty maintaining the correct blood glucose level. A diabetic needs to check their blood glucose levels many times during the day, as shown in **Figure 3**, and monitor daily sugar intake.

Internal Influences: Heredity

Genetics: Genes are sometimes turned off or on due to external factors which we have some control over. Other times, little can be done to prevent the development of certain genetic diseases and disorders. In such cases,

**FIGURE 1.3**

A person with diabetes has to monitor their blood glucose carefully. This glucose meter analyses only a small drop of blood.

medicines can help a person's body regain homeostasis. An example is the metabolic disorder Type 1 diabetes, which is a disorder where the pancreas is no longer producing adequate amounts of insulin to respond to changes in a person's blood glucose level. Insulin replacement therapy, in conjunction with carbohydrate counting and careful monitoring of blood glucose concentration, is a way to bring the body's handling of glucose back into balance. Cancer can be genetically inherited or be due to a mutation caused by exposure to toxin such as radiation or harmful drugs. A person may also inherit a predisposition to develop a disease such as heart disease. Such diseases can be delayed or prevented if the person eats nutritious food, has regular physical activity, and does not smoke.

External Influences: Lifestyle

Nutrition: If your diet lacks certain vitamins or minerals your cells will function poorly, and you may be at risk to develop a disease. For example, a menstruating woman with inadequate dietary intake of iron will become anemic. Hemoglobin, the molecule that enables red blood cells to transport oxygen, requires iron. Therefore, the blood of an anemic woman will have reduced oxygen-carrying capacity. In mild cases symptoms may be vague (e.g. fatigue), but if the anemia is severe the body will try to compensate by increasing cardiac output, leading to weakness, irregular heartbeats and in serious cases, heart failure.

Physical Activity: Physical activity is essential for proper functioning of our cells and bodies. Adequate rest and regular physical activity are examples of activities that influence homeostasis. Lack of sleep is related to a number of health problems such as irregular heartbeat, fatigue, anxiety, and headaches. Being overweight and obesity, two conditions that are related to poor nutrition and lack of physical activity greatly affect many organ systems and their homeostatic mechanisms. Being overweight or obese increases a person's risk of developing heart disease, Type 2 diabetes, and certain forms of cancer. Staying fit by regularly taking part in aerobic activities such as walking, shown in **Figure 4**, has been shown to help prevent many of these diseases.

Questions

1. When homeostasis is interrupted, what are two ways your body can respond?
 -
 -
 -
2. Why does a person with diabetes have to monitor his or her blood glucose carefully?

**FIGURE 1.4**

Adding physical activity to your routine can be as simple as walking for a total of 60 minutes a day, five times a week.

- -
 -
 -
3. Explain how in a person with Type 1 diabetes, insulin replacement therapy helps bring the body's handling of glucose back into balance.

-
-
-

4. How can such diseases as cancer or heart disease be delayed or prevented?

-
-
-

5. Give an example of how a poor lifestyle choice can lead to a health problem.

-
-
-

Lesson 19.2: Multiple Choice

Name_____ Class_____ Date_____

Circle the letter of the correct choice.

- a. When body temperature rises, the temperature change triggers a command from the
- a. brain
 - b. muscles

- c. glands
 - d. none of the above
- b. The urinary system is directly involved in maintaining
- a. muscle strength
 - b. the species
 - c. proper blood volume
 - d. growth
- c. Disruption of homeostasis can be caused by
- a. heredity
 - b. lifestyle
 - c. environmental exposure
 - d. all of the above
- d. A woman whose ovaries are removed early in life is at higher risk of developing
- a. diabetes
 - b. osteoporosis
 - c. cancer
 - d. depression
- e. A person with diabetes has to monitor what carefully?
- a. muscle strength
 - b. how much he or she eats
 - c. blood glucose
 - d. the amount of water he or she drinks
- f. _____ feedback occurs when the response to a stimulus reduces the original stimulus.
- a. Positive
 - b. Negative
 - c. Homeostatic
 - d. Regulatory
- g. Homeostasis in mammals includes
- a. the regulation of the amounts of water and minerals in the body.
 - b. the removal of metabolic waste.
 - c. the regulation of body temperature.
 - d. all of the above

Lesson 19.2: Vocabulary

Name _____ Class _____ Date _____

Match the vocabulary term with the correct definition Term.

- ____ 1. negative feedback
- ____ 2. homeostasis
- ____ 3. positive feedback
- ____ 4. cellular toxin
- ____ 5. stimulus
- ____ 6. excretion

- ____ 7. thermoregulation
- ____ 8. hormone
- ____ 9. osmoregulation
- ____ 10. endocrine system

Definition

- a. occurs when the response to a stimulus increases the original stimulus
- b. occurs when the response to a stimulus reduces the original stimulus
- c. stability, balance, or equilibrium within the cell or a body
- d. regulation of the amounts of water and minerals in the body
- e. chemical messenger molecules
- f. removal of metabolic waste
- g. substance that interferes with cellular function and causes cellular malfunction
- h. controls almost every other body system
- i. regulation of body temperature
- j. causes an increase or a decrease in the amount of hormone secreted

1.3 References

1. . . Public Domain
2. . . Public Domain
3. . . GFDL 1.2
4. . . CC-SA-BY 2.0