



#9996

YOUR IMMUNE SYSTEM

FILMS FOR THE HUMANITIES & SCIENCES, 2002

Grade Level: 10-12

28 mins.

DESCRIPTION

The body's best offense against microorganisms is its immune system. But what is it and how does it work? Why does it sometimes work against us? Discusses the nonspecific (skin, tears, saliva, mucus, stomach acid) and specific (lymphatic system, spleen, thymus, bone marrow) defenses that keeps us healthy. Describes some autoimmune diseases and various marrow-produced cells.

ACADEMIC STANDARDS

Subject Area: Health

- Standard: Knows essential concepts about the prevention and control of disease
 - ◆ Benchmark: Understands how the immune system functions to prevent or combat disease (See INSTRUCTIONAL GOALS 1-7.)

Subject Area: Science–Life Sciences

- Standard: Understands the structure and function of cells and organisms
 - ◆ Benchmark: Knows that multicellular organisms have a variety of specialized cells, tissues, organs, and organ systems that perform specialized functions (e.g., digestion, respiration, reproduction, circulation, excretion, movement, control and coordination, protection from disease) (See INSTRUCTIONAL GOALS 1-4, and 7.)
 - ◆ Benchmark: Knows the structures of different types of cell parts (e.g., cell wall; cell membrane; cytoplasm; cell organelles such as the nucleus, chloroplast, mitochondrion, Golgi apparatus, vacuole) and the functions they perform (e.g., transport of materials, storage of genetic information, photosynthesis and respiration, synthesis of new molecules, waste disposal) (See INSTRUCTIONAL GOALS 2 and 7.)
 - ◆ Benchmark: Knows that disease in organisms can be caused by intrinsic failures of the system or infection by other organisms (See INSTRUCTIONAL GOALS 2, 3, and 4.)

Subject Area: Science–Nature of Science

- Standard: Understands the nature of scientific inquiry
 - ◆ Benchmark: Knows that scientists conduct investigations for a variety of reasons (e.g., to discover new aspects of the natural world, to explain

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recently observed phenomena, to test the conclusions of prior investigations, to test the predictions of current theories) (See INSTRUCTIONAL GOALS 8.)

INSTRUCTIONAL GOALS

1. To identify the different organs of the body that compose the immune system.
2. To illustrate the cells and processes of the specific and nonspecific immune response.
3. To explain the difference between the humoral and cell-mediated immune responses.
4. To explain the difference between autoimmune and immunodeficiency diseases and what causes them.
5. To show how HIV causes AIDS.
6. To illustrate what vaccinations and antibiotics are and how they work.
7. To explain what the major histocompatibility complex is and how it works.
8. To identify some of the trends in immunological research, including new vaccinations, antibiotics, and stem cell research.

VOCABULARY

- | | |
|----------------------------|--------------------------------------|
| 1. antibody | 9. leukocytes |
| 2. antigen | 10. lymphocytes |
| 3. autoimmune diseases | 11. macrophages |
| 4. bone marrow | 12. major histocompatibility complex |
| 5. cell-mediated response | 13. monocyte |
| 6. granulocytes | 14. spleen |
| 7. humoral immune response | 15. stem cell |
| 8. immunoglobulins | 16. thymus |

BEFORE SHOWING

1. Review major systems of the body. Describe each briefly.
2. Discuss the immune system.
 - a. How does a person get sick?
 - b. How does the body defend itself against invading microorganisms and other harmful substances?
 - c. Can we see any of the body's defenses with the naked eye?
 - d. Does the immune system always work the way it should? What happens when it doesn't?
 - e. What are some of the ways in which we can help our immune system prevent disease or lessen the effects of disease?
 - f. How does the immune system distinguish foreign invaders from the cells of our own bodies?

DURING SHOWING

1. View the video more than once, with one showing uninterrupted.
2. This video is content-rich with numerous vocabulary words. Consider pausing periodically to review and discuss new terminology and concepts.

AFTER SHOWING

Discussion Items and Questions

1. What things can cause illnesses? What causes the most common illnesses?
2. Describe bacteria and viruses.
3. Explain how the skin acts as part of the immune system. How can tears, saliva, mucus, and stomach acid defend the body against microorganisms?
4. What are antigens?
5. What major organs are part of the immune response? How does the lymphatic system work? What do the spleen and thymus do?
6. Describe the different types of white blood cells and what they do.
7. What is the difference between the nonspecific and specific immune responses? What cells and processes are involved in the specific immune response?
8. Describe the humoral immune response.
9. What will happen to a person whose specific immune response isn't working?
10. What causes autoimmune diseases? Why are there no cures for autoimmune diseases?
11. What happens when a person is infected with HIV? What are the symptoms? Are they the same for all people? Why or why not? Why is it so difficult to treat an HIV infection?
12. In a normally functioning immune system, how do your white cells distinguish harmful invaders from your body's own healthy cells?
13. How do vaccinations work to help prevent disease? Why don't we have vaccinations for all diseases?
14. What are antibiotics? Why aren't they effective against a cold or the flu?
15. What do you think may happen to a person whose spleen is removed? Whose thymus gland is removed?
16. What role does the immune system play in preventing cancer? Why do people get cancer?
17. Describe some of the different types of research being done to help our immune systems fight off infections and cure disease.

Applications and Activities

1. Compare plastic wrap to skin.
 - a. Cut an apple in half. Cover one half of the apple with plastic food wrap and leave the other half uncovered.
 - b. Using a dropper, release several drops of food coloring onto each half of the apple.
 - c. Describe what happens to each half of the apple.
 - d. Explain how the plastic wrap serves a model for human skin.
 - e. Discuss what traits of human skin are not represented by the plastic wrap.
2. Investigate lymphocyte cells.
 - a. Using a microscope, look at prepared slides of different lymphocyte cells.
 - b. Identify the parts of each different kind of cell and explain the cell's development, function, structure, and activity.
 - c. Describe how B cells differ from killer T cells.

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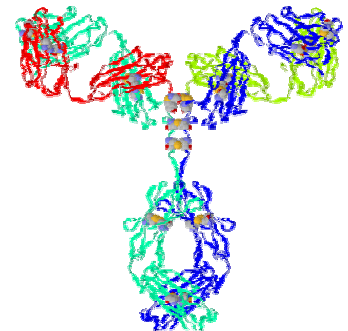
- d. Explain how macrophages assist B cells in fighting pathogens.
- e. Discuss how humoral immunity and cell-mediated immunity differ.
3. Develop a flowchart that traces the series of events involved in cell-mediated immunity.
4. Keep personal health journals, with a page for different health-related behaviors. Record habits related to that behavior during a normal week. Then assess personal healthiness. Possible page headings may be:
 - a. Eat a well-balanced and healthful diet.
 - b. Get plenty of exercise and rest.
 - c. Brush teeth, and bathe or shower regularly.
 - d. Keep a clean home.
 - e. Avoid tobacco, drugs, and alcohol.
 - f. Abstain from sexual activities.
 - g. Get vaccinations to prevent disease.
5. Research the world's first vaccine. Compare the creation of that vaccine to the way vaccines are made today.
6. Investigate how doctors during the last century (or two centuries) would have treated affliction such as infections or influenza.

SUMMARY

The program begins by introducing the various types of microorganisms that can cause disease. It then presents the major organs and components of the human immune system. The program distinguishes between specific and nonspecific immune responses and delineates the organs, processes and white cells associated with each.

In the process of learning about the body's various immune responses, the viewer learns what happens to people whose immune systems are not working quite right, such as people with allergies, autoimmune diseases (Type 1 diabetes, rheumatoid arthritis, lupus, and multiple sclerosis), and immunodeficiency diseases, such as AIDS. The program also describes what happens to the immune system with autoimmune and immunodeficiency diseases such as HIV and AIDS.

Immunization and antibiotics are introduced as ways to aid the immune system in fighting off infections. The viewer also learns about the major histocompatibility complex and how it works. Finally, the viewer is introduced to some of the types of research being done to help our immune systems fight off infections and cure disease.



CMP RELATED RESOURCES

- [AIDS and the Immune System #2649](#)
- [Defend and Repair #3354](#)
- [Internal Defenses #2079](#)
- [Preventing Communicable Diseases: Colds, Flu, AIDS, STDs #3399](#)
- [Skin #3518](#)

World Wide Web



The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and “kid safe” sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **HOW YOUR IMMUNE SYSTEM WORKS**

<http://science.howstuffworks.com/immune-system1.htm>

This detailed description of the entire immune system includes visuals and also has key words hot-linked to other articles.

- **NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES:
AUTOIMMUNE PUBLICATIONS**

<http://www.niaid.nih.gov/publications/autoimmune/autoimmune.htm>

This publication includes detailed descriptions of autoimmune diseases and their causes. In addition, it has general information about the immune system. Diagrams are included.

- **CELLS ALIVE**

<http://www.cellsalive.com>

See what various kinds of cells look like and read about what they do. Click on “Cell Biology” on the left-hand menu bar to get all of the biology contents. Be sure to scroll down on each page to get the additional information.

- **LYMPHATIC SYSTEM AND AUTOIMMUNITY**

<http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookIMMUN.html>

This site presents the contents of a biology text electronically with many words linked to definitions and some of the definitions linked to pictures.