

## Viruses and Bacteria • Section Summary

# Viruses, Bacteria, and Your Health

### Guide for Reading

- How do infectious diseases spread?
- What treatments are effective for bacterial and viral diseases?
- How can you protect yourself against infectious diseases?

Many diseases are infectious diseases—illnesses that pass from one organism to another. Infectious diseases can spread through contact with either an infected person, a contaminated object, an infected animal, or an environmental source. Other infectious diseases can be spread by inhaling the tiny droplets of moisture that an infected person sneezes or coughs into the air. This is because the droplets of moisture contain organisms that cause the disease.

Some viruses and bacteria can survive outside a person's body. They can then be spread by objects or in contaminated food or water. If you touch an object that an infected person has sneezed or coughed on, you may transfer some viruses or bacteria to yourself when you touch your mouth or eyes. If you drink water or eat food that an infected person has contaminated, you may get sick.

Animal bites can transmit some serious infectious diseases to humans. Rabbits can be spread through the bite of an infected animal. Bites from ticks can spread the bacteria that cause Lyme disease. Bites from mosquitoes can spread the virus that causes encephalitis.

Some viruses and bacteria live in food, water, and soil, or on the surface of objects. The places where they are naturally found are environmental sources of disease. A soil bacterium called *Clostridium tetani*, a soil-dwelling bacterium, can enter a person's body through a wound. It produces a poison known as a toxin, which can cause the deadly disease tetanus.

Fortunately, many bacterial diseases can be cured with medications known as antibiotics. An antibiotic is a chemical that can kill bacteria without harming a person's cells. Antibiotics are less effective today than they once were because many bacteria have become resistant to antibiotics. Antibiotic resistance results when some bacteria are able to survive in the presence of an antibiotic. Unlike bacterial diseases, there are currently no medications that can cure viral infections. For most infectious diseases, however, the best treatment is bed rest. However, there are many over-the-counter medications that treat the disease's symptoms.

One way to prevent the spread of infectious diseases is vaccines. Vaccines are important tools that help prevent the spread of infectious diseases. A vaccine is a substance introduced into the body to stimulate the production of chemicals that destroy specific viruses or bacteria. It may be made from dead or altered viruses or bacteria. The altered viruses or bacteria put the body "on alert." If the virus or bacterium ever enters the body, it is destroyed before it can produce disease.

The best way to protect against infectious diseases is to stay healthy. You should eat nutritious food and get plenty of rest, fluids, and exercise.

## Viruses and Bacteria • Review and Reinforce

# Viruses, Bacteria, and Your Health

### Understanding Main Ideas

Complete the table below by naming examples of behaviors to avoid, and behaviors to practice in order to prevent the spread of infectious diseases.

What Can You Do to Prevent Catching an Infectious Disease?	
How Disease Is Spread	DO NOT
Contact with Infected Person	DO
Contact with Infected Object	
Contact with Infected Animal	
Environmental Source	

Answer the following questions on a separate sheet of paper.

1. Why is it important to know whether your sore throat is caused by a virus or bacteria?
2. How do antibiotics work, and why are they becoming less effective?
3. How can a vaccine help prevent an infectious disease?

#### Building Vocabulary

From the list below, choose the term that best completes each sentence.

- |                       |         |            |
|-----------------------|---------|------------|
| infectious diseases   | vaccine | antibiotic |
| antibiotic resistance | toxin   |            |
4. Dead or altered viruses or bacteria that are used to stimulate the body to be "on alert" are called a(n) \_\_\_\_\_.
  5. Illnesses that pass from one organism to another are called \_\_\_\_\_.
  6. Chemicals made by microorganisms that are used to kill bacteria are called a(n) \_\_\_\_\_.
  7. A poisonous substance produced by bacteria is called a(n) \_\_\_\_\_.
  8. \_\_\_\_\_ results when some bacteria are able to survive in the presence of an antibiotic.

**Protists and Fungi • Section Summary**

**Protists and Fungi • Review and Reinforce**

**Fungi**

**Fungi**

- Guide for Reading**
- What characteristics do fungi share?
  - How do fungi reproduce?
  - What roles do fungi play in nature?

Most fungi share several important characteristics: Fungi are eukaryotes that have cell walls, are heterotrophs that feed by absorbing their food, and use spores to reproduce. Fungi also need moist, warm places in which to grow. They vary in size from unicellular yeasts to multicellular mushrooms. Three major groups of fungi include sac fungi, club fungi, and zygoe fungi.

Hyphae (singular hypha) are branching, threadlike tubes that make up the bodies of multicellular fungi. What a fungus looks like depends on the arrangement of its hyphae.

Fungi are heterotrophs, but they do not take food into their bodies like animals do. First, the fungus grows hyphae into a food source. Then digestive chemicals ooze from the hyphae into the food. The digestive chemicals break down the food into small substances that can be absorbed by the hyphae. Some fungi feed on the remains of dead organisms. Others are parasites that break down the chemicals in living organisms.

Fungi usually reproduce by making spores. The lightweight spores are surrounded by a protective covering and can be carried easily through the air or water to new sites. Fungi produce spores in reproductive structures called fruiting bodies. Unicellular yeasts use a form of asexual reproduction called budding. In budding, a small cell grows from the body of a large, well-fed cell. Asexual reproduction results in fungi that are genetically identical to the parent. Fungi may reproduce sexually, especially when conditions become less favorable. This occurs when the hyphae of two fungi grow together and new genetic material is exchanged. Its spores develop into fungi genetically different from either parent.

Fungi play important roles as decomposers and recyclers on Earth. Many fungi provide foods for people. Some fungi cause disease while others fight disease. Still other fungi live in symbiosis with other organisms. Fungi break down the chemicals in dead organisms. This returns nutrients to the soil. Yeasts are important in the preparation of foods such as bread. People also eat some types of fungi, such as mushrooms. Many fungi cause disease in crops and in humans. Others, such as *Penicillium*, make useful substances that kill bacteria. The hyphae of some fungi grow among the roots of plants. The hyphae help the plant absorb more water and nutrients from the soil. In return, the fungus feeds on extra food the plant makes. A lichen consists of a fungus living in a mutualistic relationship with either algae or autotrophic bacteria.

**Understanding the Main Ideas**  
 Figures 1 and 2 show two possible life cycles of fungi. Use these figures to answer questions 1-5. Write the answers on a separate sheet of paper.

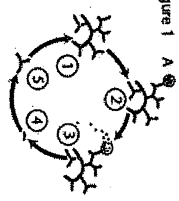


Figure 1

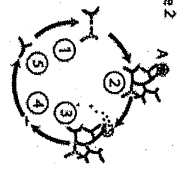


Figure 2

1. What is structure A in Figure 1 called?
2. Step 5 in Figure 1 shows a new fungus. Is it identical to its parent?
3. Step 5 in Figure 2 also shows a new fungus. Is it identical to its parents?
4. What kind of reproduction does Figure 1 show?
5. What kind of reproduction does Figure 2 show?

Answer the following questions on a separate sheet of paper.

6. Does a fungus get its food the same way you do? Explain.
7. Describe what would happen if fungi did not exist.

**Building Vocabulary**

Fill in the space to complete each sentence.

8. A(n) \_\_\_\_\_ consists of the mutualistic relationship of a fungus and either algae or autotrophic bacteria.
9. A(n) \_\_\_\_\_ is one of the branching, threadlike tubes that make up the bodies of multicellular fungi.
10. \_\_\_\_\_ is a form of asexual reproduction in yeast that does not require the production of spores.
11. A(n) \_\_\_\_\_ is a structure that produces the spores of a fungus.
12. \_\_\_\_\_ are eukaryotes that have cell walls and are heterotrophs.