Viruses, Bacteria, Protists, and Fungi

Viruses

Understanding Main Ideas

Answer the following questions on a separate sheet of paper.

1. Viruses are considered to be nonliving. How are viruses similar to living organisms? How are they different?
2. How are viruses similar to parasites?
3. How do hidden viruses differ from active viruses?
4. In the diagram below, identify the two structural parts of the virus. Explain the function of each part.

Building Vocabulary

Write a definition for each of the following terms on the lines below.

5. virus
6. bacteriophage
7. parasite
8. host
9. vaccine
Viruses

Key Concepts

■ How are viruses like organisms?
■ What is the structure of a virus?
■ How do viruses multiply?
■ How can you treat a viral disease?

A virus is a tiny, nonliving particle that enters and then reproduces inside a living cell. Biologists consider viruses to be nonliving because viruses are not cells and do not have the characteristics of organisms. The only way in which viruses are like organisms is that they can multiply.

Although viruses can multiply, they do so differently than organisms. Viruses can multiply only when they are inside a living cell. The organism that a virus enters and multiplies inside is called a host. A host is an organism that provides a source of energy for a virus or another organism. Organisms that live on or in a host and cause it harm are called parasites. Most viruses are like parasites because they destroy their host cells.

Viruses are smaller than cells and vary in shape and size. Viruses can be round, or shaped like rods, bricks, threads, or bullets. Some viruses, such as bacteriophages, have complex, robot-like shapes. A bacteriophage is a virus that infects bacteria.

All viruses have two basic parts: a protein coat that protects the virus and an inner core made of genetic material. Some viruses are surrounded by an additional membrane envelope. Each virus contains unique proteins on its outer surface. The shape of these proteins allows the virus to attach to, or lock onto, only certain host cells.

After a virus attaches to a host cell, it enters the cell. Once inside a cell, a virus’s genetic material takes over many of the cell’s functions. It instructs the cell to produce the virus’s proteins and genetic material. These proteins and genetic material then assemble into new viruses.

An active virus immediately takes over the cell’s functions, and the cell quickly begins to produce the virus’s proteins and genetic material. These parts are assembled into new viruses. When it is full of new viruses, the host cell bursts open and releases the new viruses.

When a hidden virus enters a host cell, the virus’s genetic material becomes part of the cell’s genetic material. The virus’s genetic material may stay inactive for a long time. Then, the virus’s genetic material suddenly becomes active and takes over the cell’s functions and replicates. Once the host cell is full of new viruses, it bursts open to release them.

Viral diseases can be spread in various ways. There are currently no cures for viral diseases. Resting, drinking plenty of fluids, and eating well-balanced meals may be all you can do while you recover from a viral disease. Vaccines also help prevent the spread of viral diseases. A vaccine is a substance introduced into the body to stimulate the production of chemicals that destroy specific disease-causing viruses and organisms.