

Section 1 Cell Structure

- A. Common cell structures—outer covering called cell membrane and internal gelatinlike cytoplasm
1. Comparing cells—size and shape relate to function.
 2. Two cell types
 - a. Prokaryotic cells lack membrane-bound internal structures.
 - b. Eukaryotic cells contain membrane-bound internal structures.
- B. Cell organization
1. Composed of cellulose, a cell wall grows, changes shape, and protects the cells of plants, algae, fungi, and most bacteria.
 2. Cell membrane—protective layer around all cells
 - a. For cells with cell walls, the cell membrane is inside the cell wall
 - b. A cell membrane allows food and oxygen into the cell and waste products out of the cell.
 3. Cytoplasm—gelatinlike substance inside cell membrane
 - a. Cytoskeleton—scaffolding-like structure in cytoplasm which helps cell keep its shape
 - b. In the cytoplasm, eukaryotic cells have organelles which help with cell life processes.
 4. Nucleus—contains instructions for everything cell does; includes DNA
 5. Energy-processing organelles—help cells do their work
 - a. Green organelles in plant cells contain chloroplasts to make food.
 - b. Organelles which release energy from food are called mitochondria.
 6. Manufacturing organelles
 - a. Ribosomes make proteins for cell activities.
 - b. Some ribosomes attach to the rough part of the endoplasmic reticulum, a series of smooth or rough membranes that move materials around in a cell.
 7. Transporting and storing organelles
 - a. Golgi bodies move substances out of a cell or to other parts of a cell.
 - b. Vacuoles—membrane-bound temporary storage spaces
 8. Recycling organelles—lysosomes break down food molecules and cell wastes.

C. From cell to organism

1. Tissue—group of similar cells working together on one job
2. Different types of tissues working together make up an organ.
3. A group of organs working together on a particular function form a system.

Discussion Question

What are some functions of cell parts? Processing energy; protection; providing shape; making, transporting, or storing substances

Discussion Question

What are some differences between electron microscopes and other microscopes? Magnification, lenses or magnetic fields, viewing of the image

CHAPTER 13

Content Outline for Teaching

Life's Structure and Function

Underlined words and phrases are to be filled in by students on the Note-taking Worksheet.

Section 2 Viewing Cells

A. Magnifying cells

1. Early microscopes—lenses made images larger but not always clear
2. Modern microscopes that use lenses to bend light
 - a. A simple microscope has one lens while a compound microscope has multiple lenses.
 - b. A stereomicroscope, which has two eyepieces, creates a three-dimensional image.
 - c. Powers of the eyepiece multiplied by objective lenses determine total magnification.
3. Electron microscopes—more powerful than other microscopes
 - a. Use a magnetic field in a vacuum to bend electronic beams
 - b. Images must be photographed or produced electronically.

B. Development of the cell theory

1. The cell theory resulted from many scientists' observations and conclusions.
2. The basic unit of organization is the cell.
3. All organisms are composed of one or more cells.
4. New cells come from old cells through cell division.

Discussion Question

What are some differences between electron microscopes and other microscopes? Magnification, lenses or magnetic fields, viewing of the image

END

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Section 3 Viruses

- A. Virus—a nonliving strand of hereditary material surrounded by a protein coating
- B. Virus multiplication—viruses can make copies of themselves only inside a living host cell.
 - 1. Active viruses—make the host cell create new viruses, which kills the host cell
 - 2. Latent viruses—hide in the host cell without destroying it
 - a. Virus hereditary material becomes part of the host cell hereditary material.
 - b. Latent viruses can become active and then destroy the host cells.
- C. Virus effects on organisms
 - 1. Most viruses infect only specific kinds of cells.
 - 2. Viruses are often carried to the host through the air.
 - 3. The virus and host cell must fit together exactly to begin a viral infection.
 - 4. Bacteriophages attach to bacteria and inject their hereditary material.
- D. Fighting viruses
 - 1. Vaccines—weakened virus particles which allow the host to fight some diseases
 - 2. Treating viral diseases
 - a. Antibiotics are not effective treatments for viral infections.
 - b. Infected cells sometimes produce interferons, which are proteins that can protect noninfected cells.
 - c. Antiviral drugs often have adverse side effects, limiting their use.
 - d. Public health measures can prevent or slow disease spread.
- E. Research with viruses—gene therapy uses viruses to replace defective cell hereditary material with normal cell hereditary material.

Discussion Question

How are viral diseases prevented and treated? Vaccines, antiviral drugs, public health practices, interferon production

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