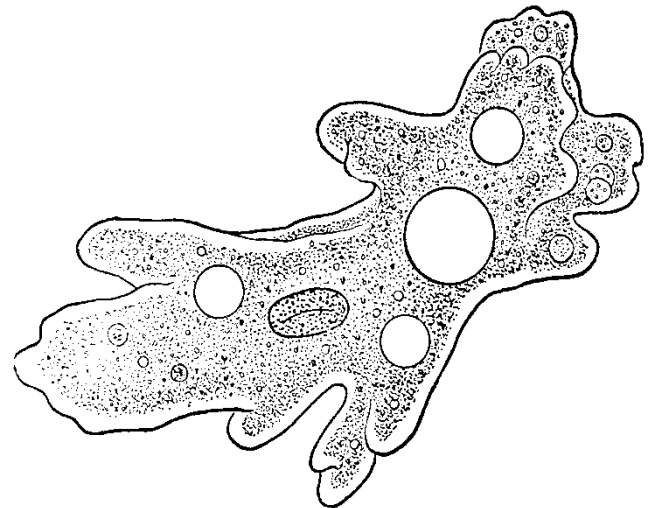


PROTISTS

CHAPTER 21



CHARACTERISTICS OF PROTISTS

SECTION 21-1

What Are Protists?

Key Idea: Protists are eukaryotic organisms that cannot be classified as fungi, plants, or animals.

What Are Protists?

- The kingdom Protista is made up of organisms that do not belong in any of the other kingdoms.
- Several important characteristics evolved in protists. Those characteristics are:
 - membrane-bound organelles
 - complex cilia and flagella
 - sexual reproduction with gametes
 - multicellularity

What Are Protists?

- Organelles, including mitochondria and chloroplasts, allow single cells to perform a wide variety of functions.
- Complex cilia and flagella like those found in protists are also found in many other types of cells
- Sexual reproduction allows for greater genetic diversity than reproduction by binary fission does.

Reproduction

Key Idea: Protists can reproduce asexually by binary fission, budding, and fragmentation. Protists can also reproduce sexually by fusion of gametes.

- A gamete is a haploid cell (egg or sperm).
- Zygote is two haploid cells that are joined.
- Zygospore is a tough outer coating of a zygote.
- The alternation of generations is multicellular protists can reproduce both sexually and asexually.

- **Binary Fission:** occurs when a unicellular organism reproduces by splitting in half after replicating its DNA.
- Multicellular organisms do not undergo binary fission.
- **Budding:** a form of asexual reproduction in which a part of the parent organism pinches off and forms a new organism.
- Budding can occur in unicellular and multicellular organisms.

- **Fragmentation:** part of a multicellular organism breaks off and starts a new organism.
- Fragmentation is the result of an action that is done to an organism.
- Budding is an action that is performed by the organism itself.

Sexual Reproduction

- In many protists, sexual reproduction occurs as a response to environmental stress.
- Zygozoospores can survive freezing, drying, and UV radiation.
- In most unicellular protists a mature organism is haploid.
- Two gametes fuse to form a diploid zygote and a zygozoospore.

- **Alternation of generations** consists of multicellular haploid and multicellular diploid phases.
- The diploid, spore-producing phase is called the *sporophyte generation*.
- The adult sporophyte has sporangia, reproductive cells that produce haploid spores by meiosis.
- The spores grow into multicellular haploid organisms. The haploid, gamete-producing phase is called the *gametophyte generation*.
- The mature gametophyte produces haploid gametes by mitosis.

- Two gametes fuse to form a diploid zygote.
- The zygote divides to form a multicellular diploid organism.
- This step begins the first stage of a new sporophyte generation.

Classifying Protists

Key Idea: The classification of organisms currently grouped in the kingdom Protista is likely to change as scientists learn more about how these organisms are related to each other and to members of other kingdoms.

Classifying Protists

- The characteristics that protists share with plants, animals, and fungi provide information about the evolution of these organisms.
- Molecular studies suggest that protists could be classified into up to 20 kingdoms!