

Name _____ Period _____

Chapter 28: Protists

This chapter covers material that may be outside the AP Biology curriculum, but in your study of biology you are likely to encounter a number of protists. We think it may be valuable for you to know about some of the protists that you are most likely to see in lab or hear discussed because of their impact on human health.

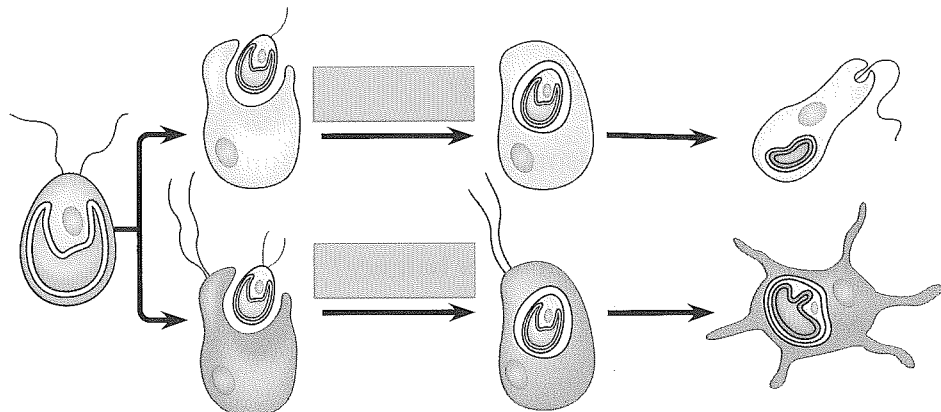
Overview

You may have learned about the kingdom Protista, but this is no longer recognized as an official taxon because work in Protista systematics has revealed that the kingdom is polyphyletic. The former Kingdom Protista has been divided into many separate kingdoms. Biologists now use the term *Protista* in a general, nontechnical way to refer to eukaryotes that are neither plants nor animals nor fungi. As we move through this chapter, we will concentrate on the evolutionary events of significance and the specific protists that are important.

Concept 28.1 Most eukaryotes are single-celled organisms

1. Protists vary in structure and function more than any other group of organisms. However, here are some common traits:
 - a. All have membrane-bounded organelles, and so are _____.
 - b. Most are single-celled, or _____.
 - c. They get their food in several ways. Some contain chloroplasts and do photosynthesis, and so are considered _____. Others ingest food particles and so are _____.

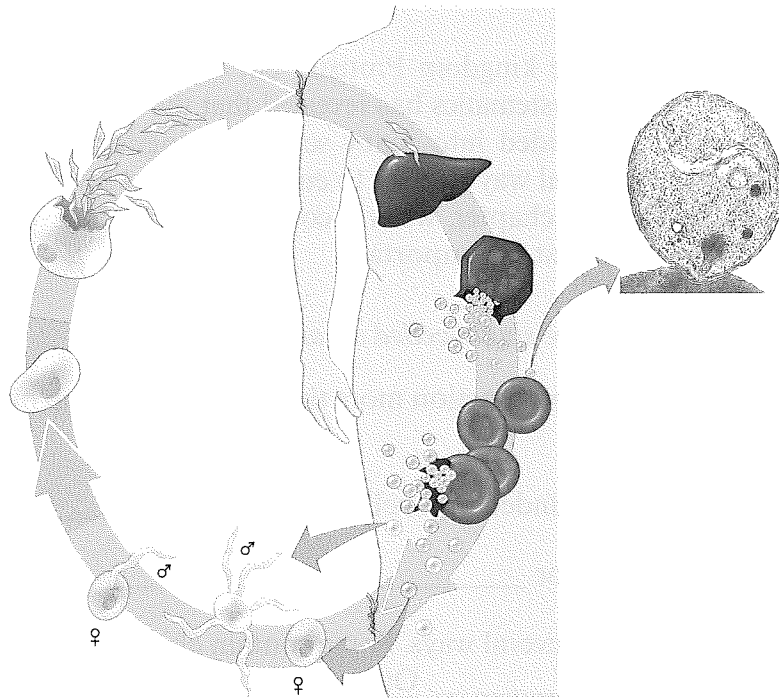
2. *Endosymbiosis* is a key component of eukaryotic evolution, which was discussed in Concept 25.3. Many protists are also the result of *secondary endosymbiosis*. Using Figure 28.3 from the text, label the following figure to show the key steps in several secondary endosymbiotic events.



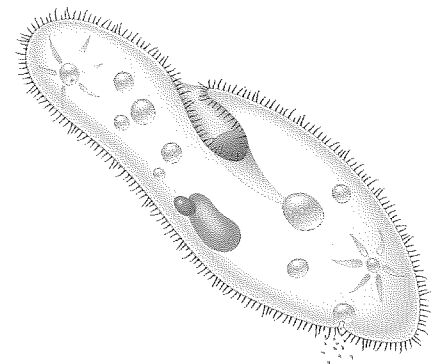
3. Define *secondary endosymbiosis*.

Concept 28.3 The “SAR” clade is a highly diverse group of protists defined by DNA similarities

4. Malaria is a leading cause of infectious disease. Over 250 million people in the tropics are infected each year, and 900,000 die annually. You probably recall the relationship between sickle-cell anemia, malaria, and the heterozygote advantage (Figure 23.17). Let’s look now at the organism that causes malaria. It is a parasitic protist, in the genus *Plasmodium*. *Plasmodium* uses both mosquitoes and humans as alternate hosts in its complex life cycle, shown in the following figure. Number and explain eight steps in the *Plasmodium* life cycle.



5. Answer these questions about the ciliate *Paramecium*.
- On the image, label the macro- and micronucleus, food and contractile vacuoles, and oral groove.
 - How does the *Paramecium* obtain food?
 - How do food vacuoles and lysosomes help with nutrition?
 - The *Paramecium* is hypertonic to its surroundings, so how does this organism maintain water balance?



Concept 28.6 Protists play key roles in ecological communities

6. Describe one mutualistic relationship and one parasitic relationship involving protists.

mutualistic example:

parasitic example:

7. What is a key ecological role of protists in many aquatic food webs?
8. This is a large chapter with a great deal of information about many different protists. To give you an idea of some of them, here is a short list gleaned from your text. You may recognize many of these protists:
- a. *Giardia intestinalis* (causes “hiker’s diarrhea”; always treat your water!)
 - b. *Trichomonas vaginalis* (sexually transmitted infection)
 - c. *Trypanosoma sp.* (sleeping sickness and Chagas’s disease)
 - d. *Euglena* (remember seeing the tiny flagellated green cell with a red eyespot in Bio. I?)
 - e. Dinoflagellates (blooms cause “red tides”; many are bioluminescent)
 - f. *Plasmodium* (causative agent of malaria)
 - g. Ciliates (*Paramecium* and *Stentor* are examples; micro- and macronuclei)
 - h. *Amoeba* (move by pseudopodia)
 - i. Diatoms (unicellular with two-part, glass-like wall made of silica)
 - j. Golden algae
 - k. Brown algae (kelp)
 - l. Oomycetes (water molds and their relatives; includes causative agent of potato blight)
 - m. Red algae (multicellular; some found at great depths; sushi wraps)
 - n. Green algae (*Chlamydomonas*, *Ulva*, *Volvox*; this group is the closest relative of land plants)
 - o. Slime molds

Test Your Understanding Answers

Now you should be ready to test your knowledge. Place your answers here:

1. _____ 2. _____ 3. _____ and 6. _____