

Protists

Characteristics of Protists

- **Protists** are unicellular organisms that contain a nucleus
- Most protists live in watery environments
 - Salt water, fresh water, moist soil, inside larger organisms
- Some protists live in colonies
- **Colony** – A number of independent cells of the same species that are attached to one another



- Protists evolved about 1.5 billion years ago
- Some are autotrophs, some are heterotrophs
- Some can function as both, depending on their surroundings
- Protists are so different than other organisms, there are arguments about how to classify them
- We are going to use three categories
 - Animal-like protists
 - Plant-like protists
 - Fungus-like protists

Animallike Protists

○ These protists are heterotrophs

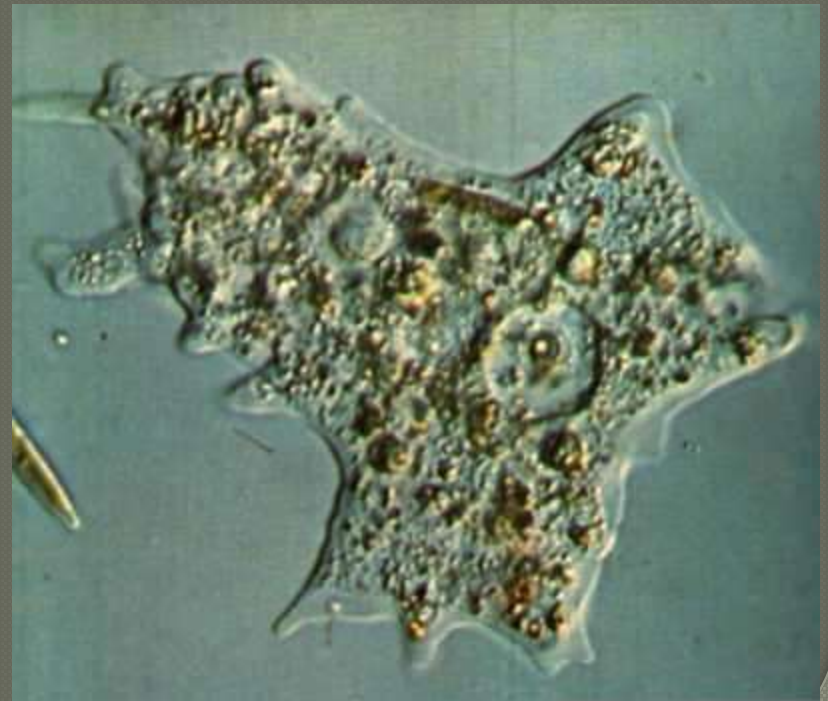
○ Animallike protists are divided into four main groups

1. Sarcodines
2. Ciliates
3. Zooflagellates
4. Sporozoans



- ① 1.) Sarcodines – Type of protists that can form pseudopods
- ② Pseudopod – An extension of the cell membrane and cytoplasm
 - In Greek this word means “false foot”
- ③ Pseudopods are used to capture and engulf particles of food
 - Also used for movement
 - VIDEO!!!

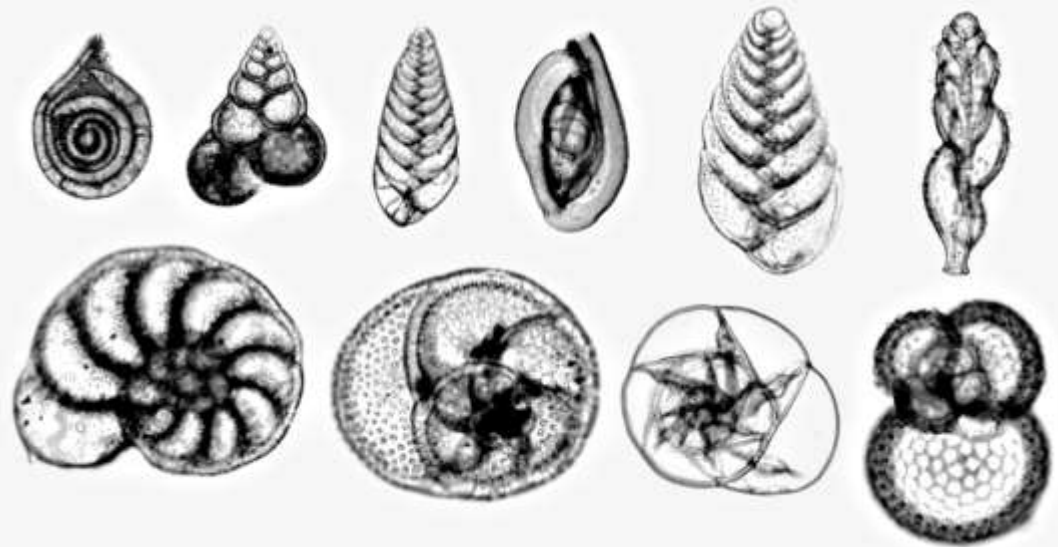
- A common sarcodine is the ameba
- Ameba – A sarcodine that uses pseudopods to move and obtain food
- The food then goes into a food vacuole
- Food Vacuole – Is a structure inside the cell that digests food



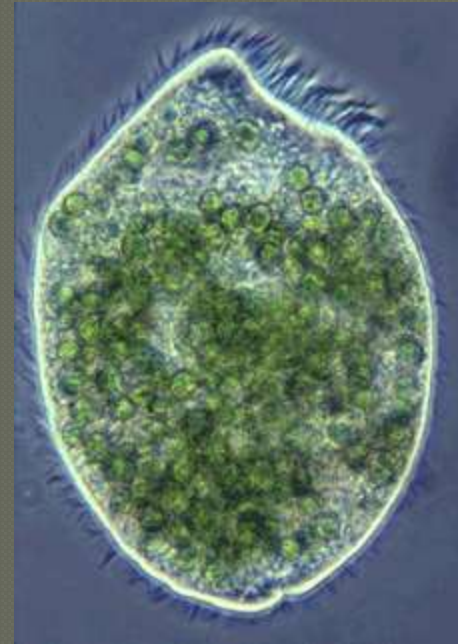
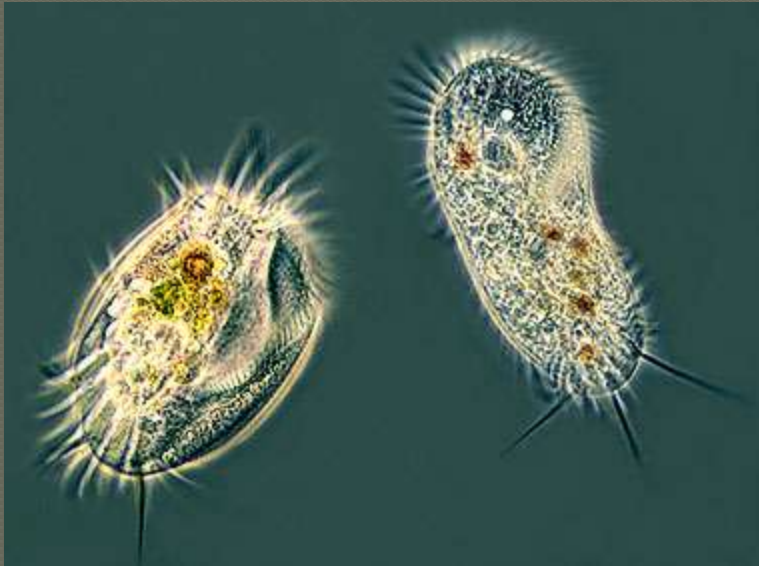
- ◉ Because amebas live in water, they must continuously pump water out of the cell
- ◉ Contractile Vacuole – A structure that pumps excess water out of the cell
- ◉ Amebas reproduce by splitting in half
- ◉ VIDEO AGAIN



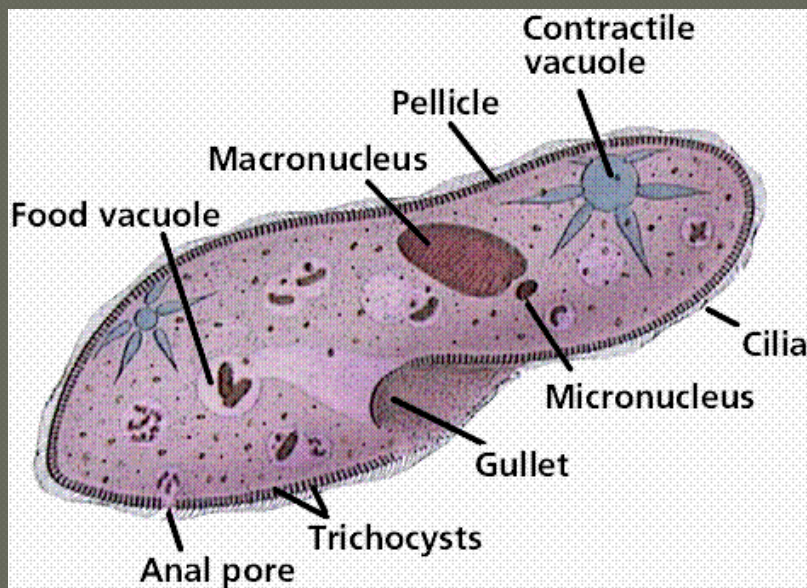
- **Foraminiferans** – Sarcodines that have shells that support and protect the cell
- When these foraminiferans die, their shells sink to the ocean floor and form thick layers
 - This is how limestone is formed
 - Marble contains many of these shells
 - Even chalk!



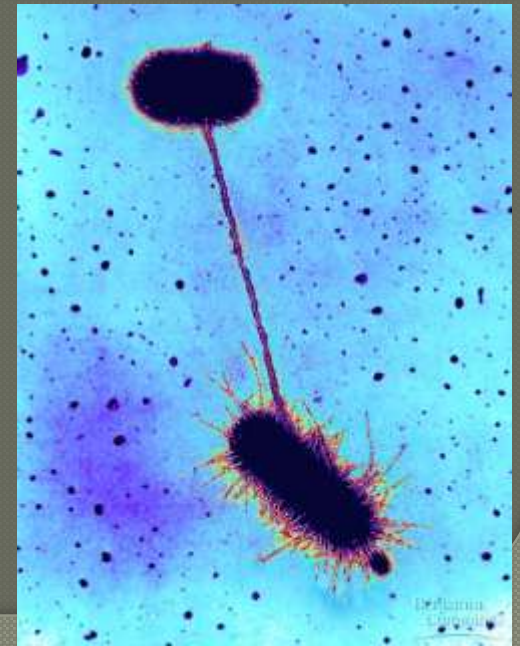
- 2.) **Ciliates** – Organisms that are covered with tiny hairlike structures called cilia
- Cilia** – Are hairlike projections on the outside of the cell that assist the cell in movement, obtaining food, and act as sensors



- Example of ciliates is the paramecium
- Paramecium – Is a slipper shaped organism that is covered with cilia
- Paramecium use cilia to sweep food particles floating in the water into their “mouth” called an oral cavity



- Paramecium and other ciliates have two nuclei
- Paramecium can perform a process called conjugation
- **Conjugation** – The sharing of genetic information between two organisms
- The paramecium then reproduce by splitting in half crosswise

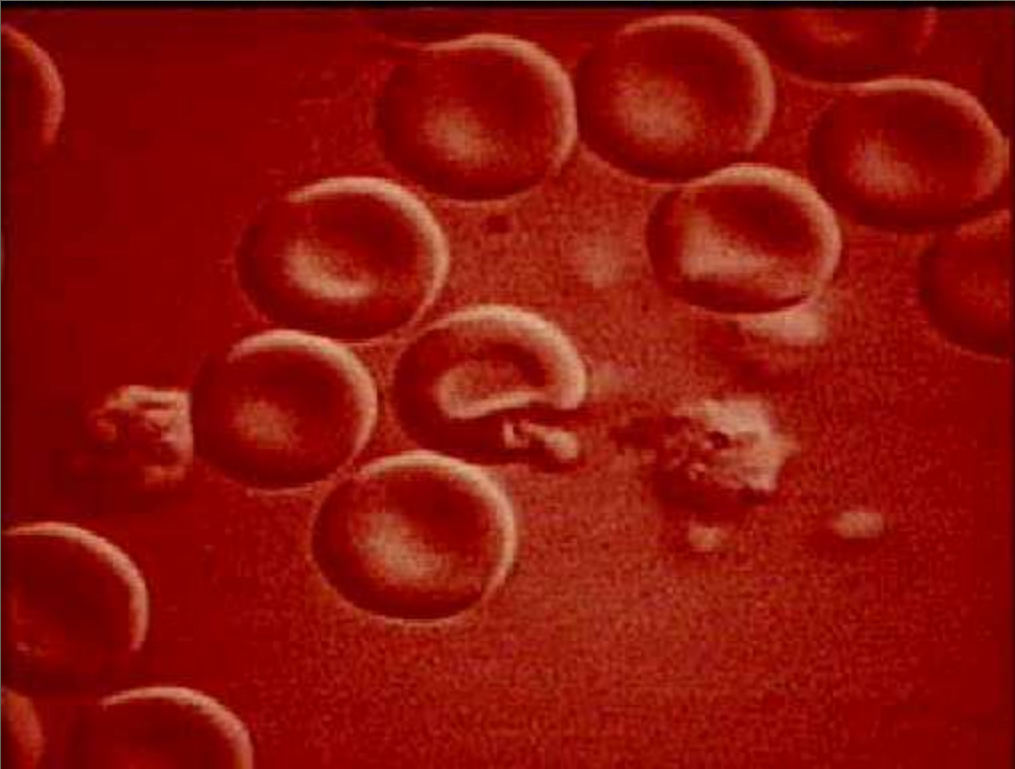


- 3.) **Zooflagellates** – Protists that move by means of flagella
- **Flagella** – Tail-like structure that propels a cell through watery environments
- Many zooflagellates live inside the bodies of other organisms
- For example, termites and wood roaches rely on zooflagellates living inside their intestines to help them digest the wood they eat



- ④ 4.) **Sporozoans** – Parasites that feed on the cells and body fluids of their host animals
- ④ Many sporozoans have complex life cycles that involve more than one host
- ④ During their life cycles they form spores
- ④ Plasmodium is an example of a sporozoan
- ④ Plasmodium causes the disease malaria

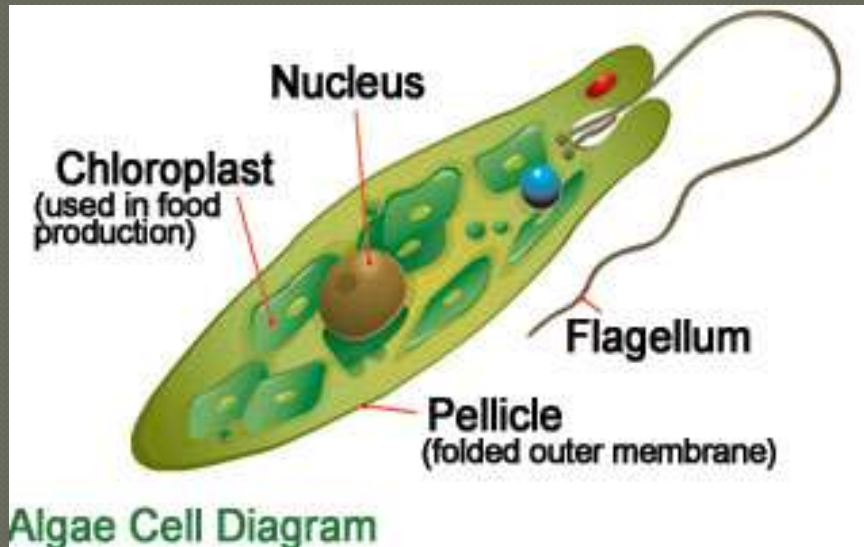
- When this sporozoan gets into the human from the mosquito it infects the liver. The sporozoans then infect the red blood cells causing them to burst.



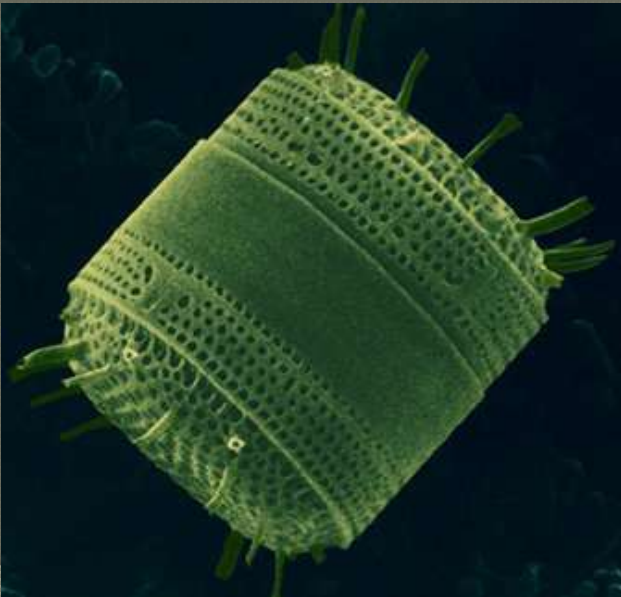
Plantlike Protists

- Plantlike protists are autotrophs
- They are very important because they are food for many other organisms
- Produce oxygen as a byproduct
 - About 70% of the Earth's oxygen is produced by plantlike protists
- Most move using flagella
- Three groups:
 - Euglenas
 - Diatoms
 - Dinoflagellates

- 1.) Euglenas – Plantlike protist that has two flagella, a reddish eyespot, and chloroplast for food making
 - The eyespot is sensitive to light
 - Helps it seek out light to perform photosynthesis



- ② 2.) **Diatoms** – Plantlike protists that are colorful and enclosed in a glassy shell
- ② When diatoms die, their shells are left behind
 - These shells are used in toothpaste, car polish, scouring cleaners because they are rough
 - They also reflect light very well. They are added to paint that is used for lines on the highways



- 3.) Dinoflagellates – Plantlike protists with two flagella that range in color from yellow-green to orange-brown
- One flagella helps them swim, the other wraps around the cell allowing it to spin like a top



- **Red Tide** – When dinoflagellates reproduce so rapidly that the water becomes colored by them.
- Some dinoflagellates produce toxins that can injure or kill living things during red tides



- Some dinoflagellates can even glow like fireflies. Sometimes they can be seen illuminating the oceans



Funguslike Protists

- Funguslike protists are heterotrophs and most have a cell wall
- They can infect plants, animals and fish
- In 1945 and 1946 a funguslike protist killed the entire potato crop in Ireland. This was called the **Great Potato Famine**. One third of Irelands population died

- An example is the slime mold
- **Slime mold** – A moist, flat, shapeless blob that oozes over dead trees, eating bacteria
- Slime molds have a complex life cycle
 1. Protist is in the form of a slime mold
 2. Fruiting bodies grow up from the slime mold
 3. Fruiting body releases spores
 4. The spores grow and produce amoeba like cells
 5. These eventually form a slime mold again and it starts over

