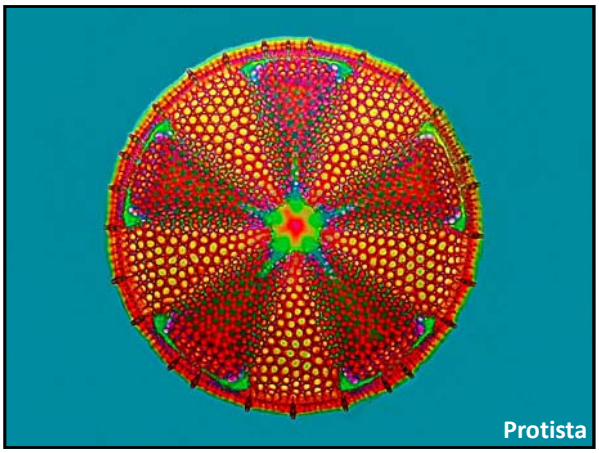


Protists are in the Eukaryote Domain

All protists are eukaryotic (cells with a nucleus)


Paramecium

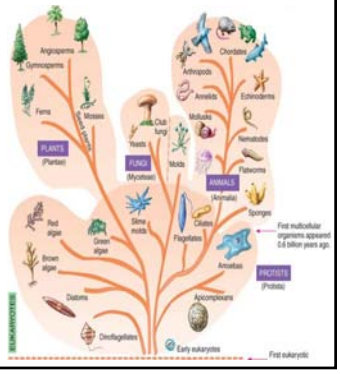

Amoeba

Euglena

Protists are really just all of the Eukaryotes that don't fit into the Animal, Fungi or Plant kingdoms.

DNA analysis shows that many of the organisms placed in the Kingdom of Protista are not closely related to one another.

Protista is really just a **classification of convenience** as Biologists work out where these creatures really belong.

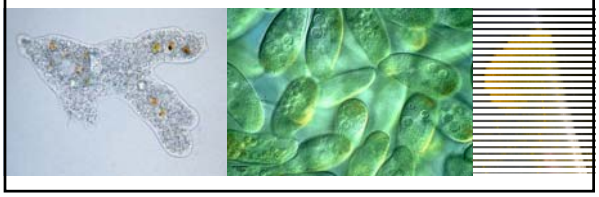


Protists are a large and diverse group of eukaryotic microorganisms that live in any environment that contains liquid water.

The term protista was first used in 1866.

Protists are such a diverse group of organisms that they can be classified by their method of obtaining nutrition:

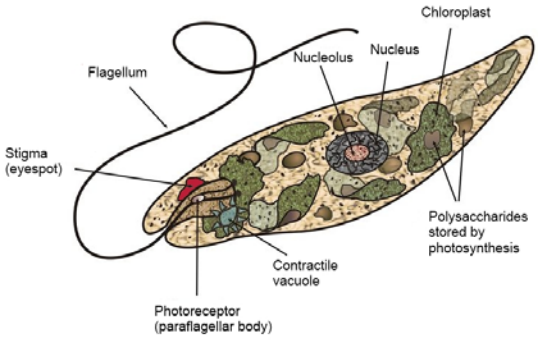
- the "**animal-like**" protozoa
- the "**plant-like**" protophyta (mostly algae)
- the "**fungus-like**" slime molds



The Euglenozoa

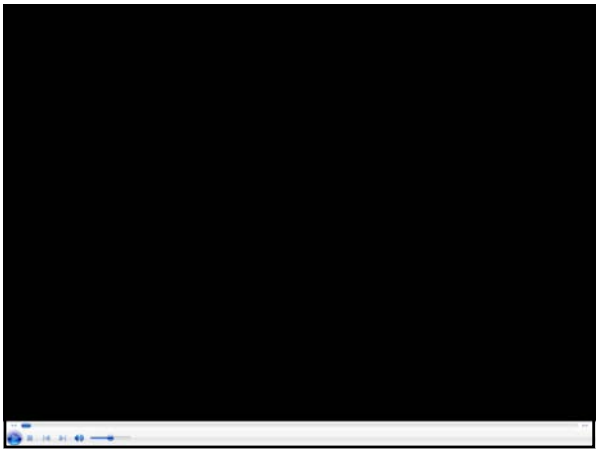
Many swim by using one or two flagella.

Euglena have chloroplasts which allows them to do photosynthesis.



Euglena lacks a cell wall. Instead, it has **a pellicle** made up of a protein layer supported by microtubules. The action of these pellicle strips sliding over one another gives Euglena its exceptional flexibility and contractility.

Euglena reproduce asexually through binary fission and in low moisture conditions, or when food is scarce, *Euglena* forms a protective wall around itself and lies dormant as a resting cyst until environmental conditions improve.



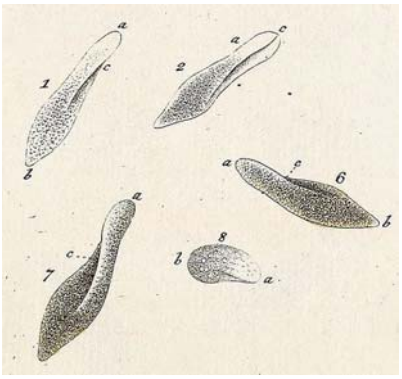
Ciliates

Move by the rhythmic beating of their cilia.

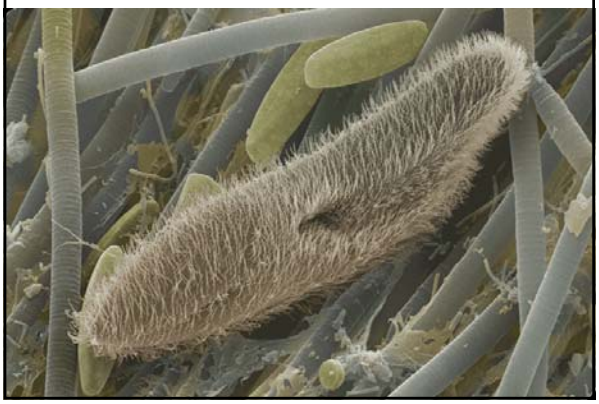
Examples: Paramecium, Stentor.

Although single-celled, some are large enough to be seen with the naked eye.

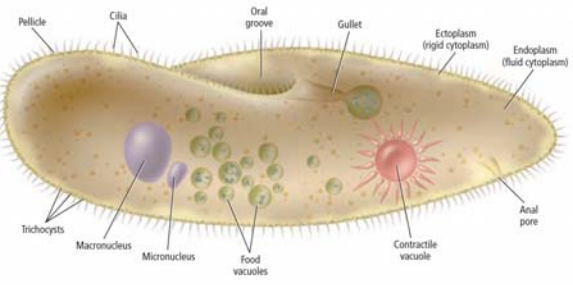
A paramecium is a unicellular protozoan. It is enclosed by a layer of membrane called a **pellicle.**

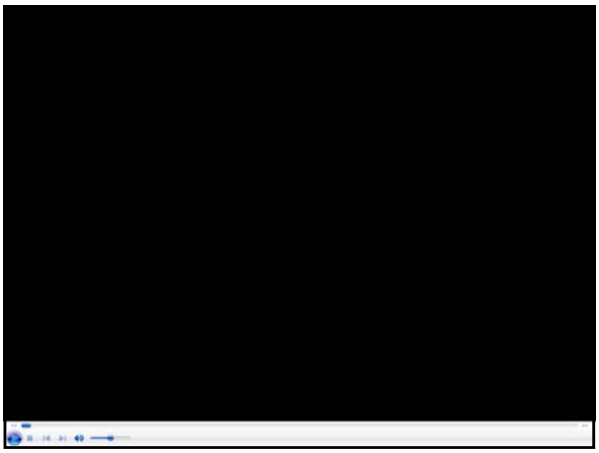


Cilia allow Paramecium to move in their watery environment

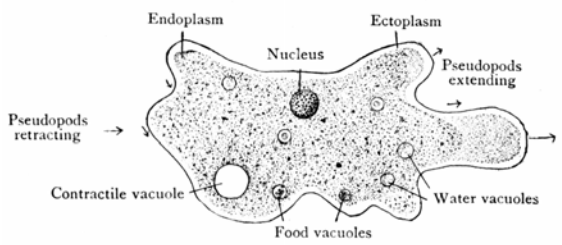


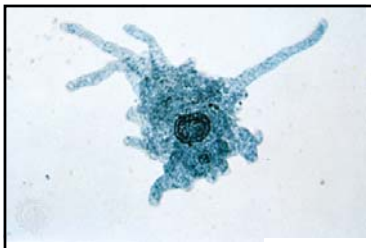
Paramecia are widespread in freshwater, brackish and marine environments, and are often very abundant in stagnant basins and ponds.





The Amoeba use pseudopods to move and capture food. They are found in soil and aquatic habitats.





Early naturalists referred to Amoeba as the *Proteus animalcule* after the Greek god Proteus, who could change his shape.

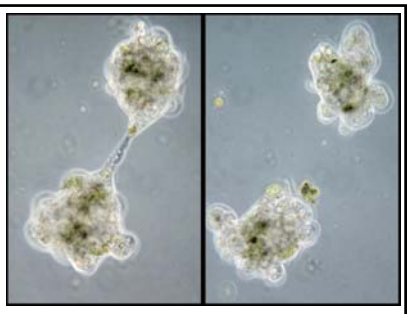
The cell's organelles and cytoplasm are surrounded by a cell membrane.

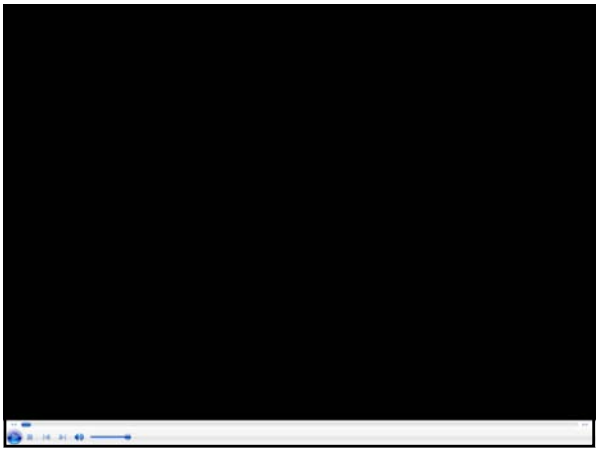
They obtain food through phagocytosis.

Amoeba are heterotrophs.

Amoebas reproduce by asexual reproduction

One parent cell divides into two identical daughter cells.

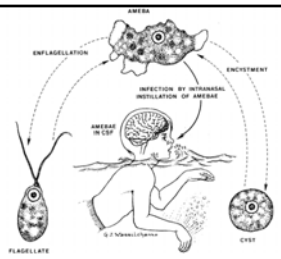




***Naegleria fowleri* is commonly referred to as the "brain-eating amoeba.**

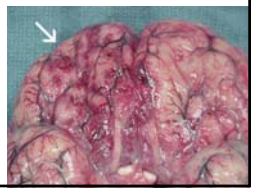
It can cause a rare and devastating infection of the brain called primary amebic meningoencephalitis (PAM).

The ameba is commonly found in warm freshwater (lakes, rivers) and soil. *Naegleria fowleri* usually infects people when contaminated water enters the body through the nose. Once the ameba enters the nose, it travels to the brain where it causes PAM, which is usually fatal.



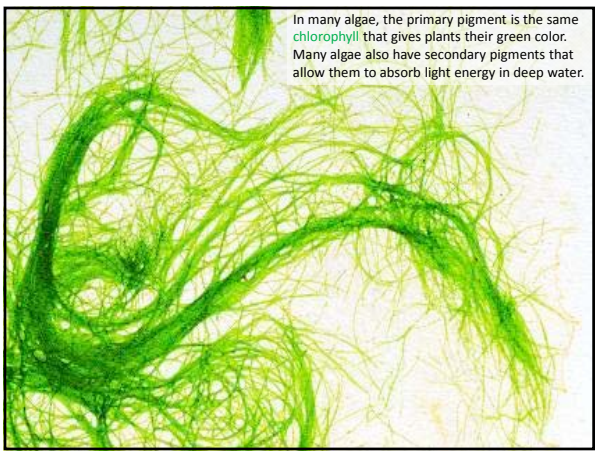
In very rare instances, Naegleria infections may also occur when contaminated water from other sources (such as inadequately chlorinated swimming pool water or heated and contaminated tapwater) enters the nose.

You cannot get infected from drinking water contaminated with Naegleria.

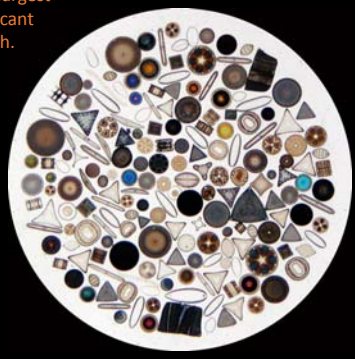



Algae is an example of a plantlike protist.
Algae are mostly microscopic and unicellular but some are multicellular.
© Dwight Kuhn


Kelp makes its own food through photosynthesis.
Giant kelp (a protist) can grow up to 65 m long.


In many algae, the primary pigment is the same chlorophyll that gives plants their green color.
Many algae also have secondary pigments that allow them to absorb light energy in deep water.

The diatoms are one of the largest and ecologically most significant groups of organisms on Earth.



Diatoms are a major group of **algae**, and are among the most common types of phytoplankton.

Most diatoms are unicellular.

Reproduction is mostly asexual by binary fission

Diatomaceous earth consists of fossilized remains of diatoms.

It is used as a filtration aid, mild abrasive in products including toothpaste, cat litter, activator in blood clotting studies, a stabilizing component of dynamite, and a thermal insulator.

Diatoms store their food as oil instead of as a carbohydrate. This makes them a valuable food source to fish and other aquatic organisms.

Slime molds

Slime molds used to be classified as fungi but are no longer considered part of that kingdom.

Although not related to one another they are grouped, for convenience, in the kingdom Protista.

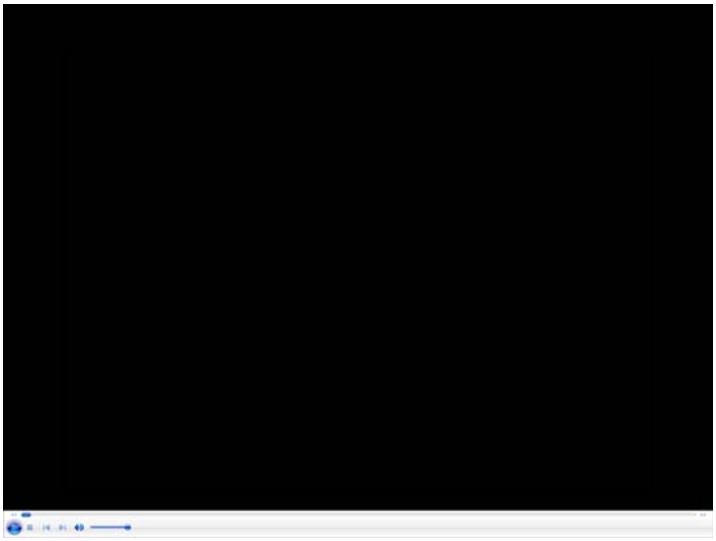
Slime molds are similar to fungi because they absorb their nutrients from other organisms. These organisms are not classified as fungi because slime molds contain centrioles (organelles involved in mitosis) which are not found in fungi and their cell walls use different chemicals.

When there is plenty of food slime molds exists as a single-celled organisms.

When food is limited they will join together and start moving as a single body.

When joined together they are sensitive to airborne chemicals and can detect food sources.

They can reproduce by spores.



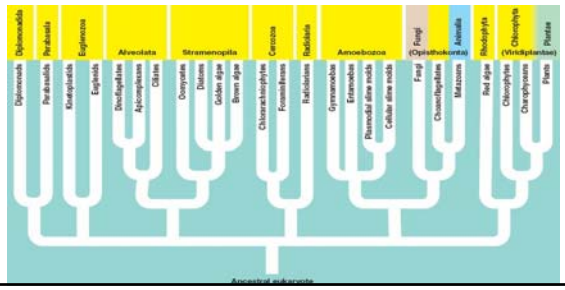
Animal-Like Protists (Protozoans)	Plant-Like Protists (Algae)	Fungus-Like Protists (Slime Molds)
• Ciliates, amoebas	• Euglenoids, diatoms, algae	• Slime molds
animal-like because they consume other organisms for food. Some are parasites.	plantlike because they make their own food through photosynthesis.	funguslike because they feed on decaying organic matter and absorb nutrients through their cell walls

Grouping protists by how they obtain nutrition is a convenient method of classifying them.

However, this method does not include an organism's evolutionary history.

Scientists are still trying to sort out the evolutionary relationships between protists and the other kingdoms.

As we learn more information, the classification known as Kingdom Protista will change.



The protozoans *Giardia lamblia* and *Cryptosporidium parvom* are major causes of waterborne intestinal diseases throughout the world. A very sensitive detection method was developed using the DNA amplification procedure PCR (polymerase chain reaction). This procedure can detect the presence of incredibly small amounts of these pathogens as little as a single cell in two liters of water.

Explain how this method might be used by the city water department to protect us.