Protists

Protists belong to the Kingdom Protista, which include mostly unicellular organisms that do not fit into the other kingdoms.

### Characteristics of Protists

* mostly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, some are multicellular (algae)
* can be heterotrophic or autotrophic
* most live in water (though some live in moist soil or even the human body)
* ALL are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (have a nucleus)
* **A protist is any organism that is not a plant, animal or fungus**
* *Protista* = the very first

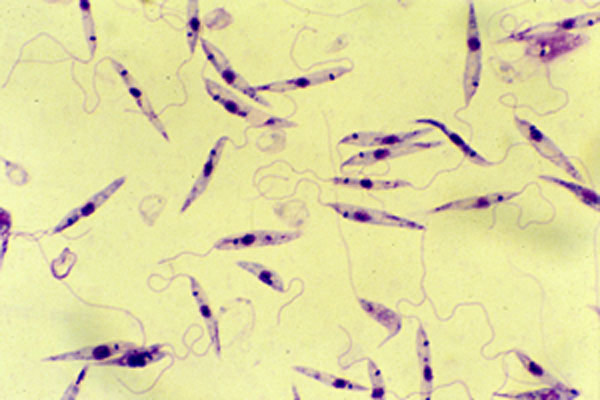
### Classification of Protists

* how they obtain nutrition
* how they move

Animallike Protists – also called \_\_\_\_\_\_\_\_\_\_\_ (means “first animal”) – heterotrophs  
Plantlike Protists – also called algae – autotrophs  
Funguslike Protists – heterotrophs, decomposers, external digestion

Four Phyla of Animal-like Protists

–  Classified by how they move

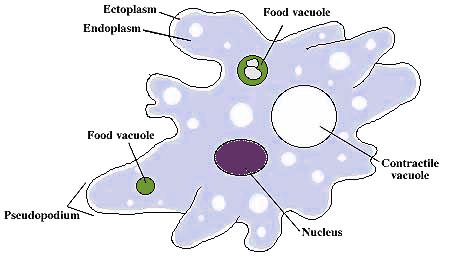
* Zooflagellates – \_\_\_\_\_\_\_\_\_
* Sarcodines – extensions of cytoplasm (pseudopodia)
* Ciliates – \_\_\_\_\_\_\_\_\_\_\_\_\_
* Sporozoans – do not move

### Zooflagellates

* move using one or two \_\_\_\_\_\_\_\_\_\_\_
* absorb food across membrane
* Ex.  Leishmania

### Sarcodines

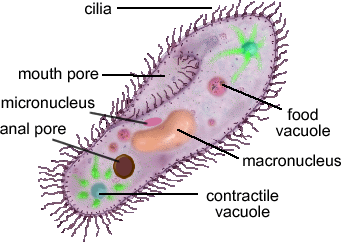
* moves using pseudopodia ( “false feet” ), which are like extensions of the cytoplasm —**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* ingests food by surrounding and engulfing food (endocytosis), creating a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* reproducing by binary fission (mitosis)
* contractile vacuole – removes excess water
* can cause amebic dysentery in humans – diarrhea and stomach upset from drinking contaminated water
* Other sarcodines: Foraminferans, Heliozoans



Video:  Ameba Proteus

### Ciliates

* Paramecium (See [Paramecium Coloring Sheet](http://www.biologycorner.com/worksheets/paramecium_color.html))
* move using cilia
* has two nuclei: macronucleus, micronucleus
* food is gathered through the :mouth pore, moved into a**\_\_\_\_\_\_\_\_\_\_\_\_**, forms a food vacuole
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is used for removing waste
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** removes excess water
* exhibits avoidance behavior
* reproduces asexually (binary fission) or sexually (conjugation)
* outer membrane -pellicle- is rigid and paramecia are always the same shape, like a shoe



### Sporozoans

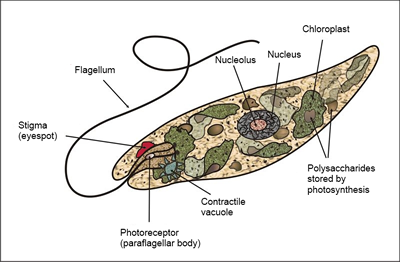
* do not move on their own
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Malaria is caused by a sporozoan  (Plasmodium), which infects the liver and blood; transmitted by mosquitos

**Plantlike Protists: Unicellular Algae**

* contain chlorophyll and carry out \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* commonly called algae
* four phyla: euglenophytes, chrysophytes, diatoms, dinoflagellates
* accessory pigments help absorb light, give algae a variety of colors

**Euglenophytes**

* live in water
* have**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** for movement
* use **chloroplasts** for photosynthesis, but can turn into heterotrophs if they are kept in the dark
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** used for sensing light and dark
* pellicle - like a cell wall, helps maintain their shapes

|  |  |  |
| --- | --- | --- |
| Chrysophytes [phaeoplaca2_bga](http://www.flickr.com/photos/55038698@N03/5184620909/) | Diatoms [Arranged Diatoms on Microscope Slides in the California Academy of Sciences Diatom Collection](http://www.flickr.com/photos/casgeology/8981509235/) | Dinoflagellates [Ceratium tripos (light micrograph)](http://www.flickr.com/photos/myfwc/5842184813/) |

### Ecology of Unicellular Algae

**Plantlike Protists: Red, Brown, Green Algae**

* make up the base of aquatic food chains
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ makes up half of the photosynthesis that occurs on earth (oxygen)
* can cause Red Tides - algal blooms - which are toxic

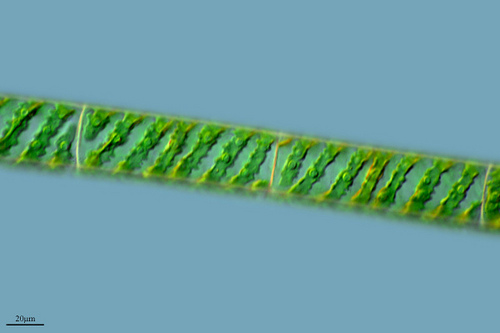
[](http://www.flickr.com/photos/tgaw/4006295165/)

Green Algae: Phylum Chlorophyta

Unicellular green algae, Colonial (volvox), Multicellular (ulva, sea lettuce)

Spirogyra

* live in water, multicellular
* named after a spiral shaped chloroplast
* autotrophic

[](http://www.flickr.com/photos/microagua/6966654057/)

**Funguslike Protists**

* heterotrophs, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* called slime molds and water molds
* water molds responsible for the Irish Great Potato Famine

[Dog Vomit Slime Mold](http://commons.wikimedia.org/wiki/File:Dog_vomit_slime_mold.jpg#file) - because it looks like dog puke, but it's really a protist, in the phylum Myxomycota