

# Protozoa report

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Protozoa are single-celled eukaryotes organisms whose cells have nuclei that normally show characteristics associated with animals, most common mobility and heterotrophy. They are often grouped in the kingdom Protista together with the plant-like algae and fungus-like water molds and slime molds. Most algae are classified in the kingdoms Plantae and Chromista, and some the remaining forms may be classified as a kingdom Protozoa.

The name is misleading, since they are not animals. Protozoa have traditionally been divided on the basis of locomotion. Most protozoans are too small to be seen with the naked eye - most are around 0.01-0.05 mm, although forms up to 0.

5 mm are still fairly common - but can easily be found under a microscope. There are 4 groupings of protozoans. The Amoeba called the Sarcodines and the Flagellates called the Mastigotes are sometimes linked into one group called the Sarcomastigotes because of similar features. The Ciliates are about as complicated as single cells can be. The Sporozoans tend to be tiny parasites, often living inside other cells, but are also pretty complicated.

Most people recognize the Amoeba as blobby, with a shape that's always changing, kind of oozing along a surface. Most of your white blood cells, which aren't amebas at all, also look and act like this. Our human genes include codes to that build good look-a-like Amoebas. Amoeba have a feature that sets them apart from most other protozoans, a type of extension of the cell, called pseudopods "phony feet". The classic amoeba has fairly thick pseudopods, produced by moving material inside the cell in such a way that part of it is pushed out.

The membrane of a pseudopod is able to stick to most surfaces, and the rest of the cell sort of “flows” into position. The flagellates are characterized by the possession of flagella: one or more but rarely more than a dozen long, mobile extensions from the cell. Unlike pseudopods, flagella have a rigidly-organized core of cross-connected microtubules that drive them. Flagella move in various ways: they may spin, or whip, or move like tentacles, and more. They may carry extra structures, like bristles, or combs, or stiff sections, or a flat outgrowth of membrane that acts like a fin. Most flagellates are swimmers – being microscopic, they are not powerful swimmers, but many can get from place to place if the distances between are not very large.

Ciliates are often organized in a way that seems more multicelled in complexity, almost more complexity than even seems possible with only one cell. Ciliates often have a depression or furrow on their surface down which a current drives food, at the bottom, which is often called an oral groove, food vacuoles form which often follow a set path through the cell almost like the track of food through a digestive tract, ending at a special spot at which the undigested contents are dumped outside. Freshwater ciliates have contractile vacuoles that “bail” the water that continually floods in from the dilute surroundings. Amoebas and flagellates often have simple bubbles, but ciliates may have channels, and collection centers, and other complex patterns for their contractile vacuoles. The Sporozoans, reflects a structure at one end of cells, an apical complex. Every species in this group is parasitic, although the amount of damage they cause to the host varies quite a bit.

It is quite common that apicomplexans live as parasites inside other cells, giving them the ability to parasitize both single-celled and multi-celled organisms. They also go through alternation of generations, which in parasites creates different classes of hosts: hosts in which the parasites reproduce asexually are intermediate hosts; hosts in which sexual reproduction occurs are called definitive hosts. Sexual reproduction usually involves two genders, with some cells small and mobile male and others large and stationary female. Several species of apicomplexans have huge impacts on humans. They may infect domestic livestock, from cows to chickens, pets, including dogs and cats, and people themselves. Probably the best-known apicomplexan is Plasmodium, which causes malaria.

Mosquitoes are the place where sexual reproduction occurs, although in this case some asexual reproduction takes place in there as well as sexual and humans are the intermediate hosts where asexual reproduction takes place. Plasmodium in humans reproduces first in liver cells, where it produces no real symptoms, and then in red blood cells, where the immune system's tries to fight it produce most of the disease symptoms. Mosquitoes pick up the parasites with a blood meal, and the Plasmodium reproduces sexually in the mosquito's gut, migrates to the outer wall of the gut to make copies asexually, and then moves to the salivary glands, from which it will be "spit" into the next victim.