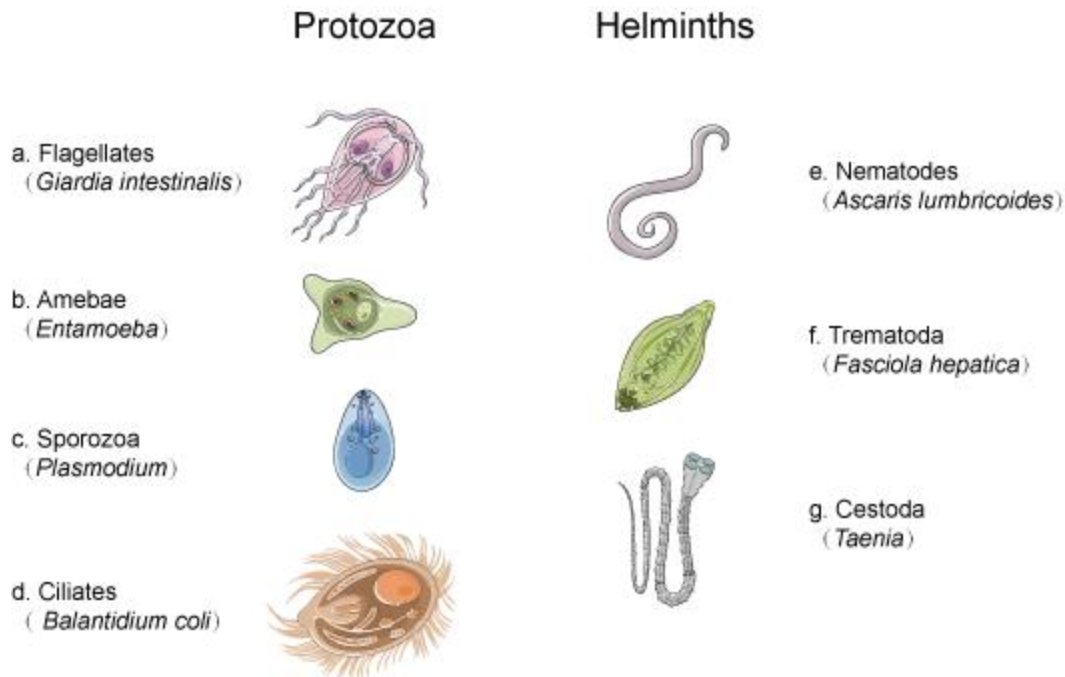


Parasite

A parasite is defined as an organism that lives in a more or less close association with another organism of a different species (the host), derives sustenance from it and is pathogenic to the host, although this potential is not always expressed.



Parasites Category.

Protozoa are unicellular eukaryotes that form an entire kingdom. The parasitic protozoa can be divided into four traditional groups based on their means of locomotion and mode of reproduction: flagellates, amebae, sporozoa, and ciliates.

- (1) Flagellates have one or more whiplike flagella and, in some cases, an undulating membrane (eg. trypanosomes). These include intestinal and genitourinary flagellates (*Giardia* and *Trichomonas*, respectively) and blood and tissue flagellates (*Trypanosoma* and *Leishmania*).
- (2) Amebae are typically ameboid and use pseudopodia or protoplasmic flow to move. They are represented in humans by species of *Entamoeba*, *Naegleria*, and *Acanthamoeba*.
- (3) Sporozoa undergo a complex life cycle with alternating sexual and asexual reproductive phases. The human parasites *Cryptosporidium*, *Cyclospora*, and *Toxoplasma* and the malarial parasites (*Plasmodium* species) are all intracellular parasites.
- (4) Ciliates are complex protozoa bearing cilia distributed in rows or patches, with two kinds of nuclei in each individual. *Balantidium coli*, a giant intestinal ciliate of humans and pigs, is the only human parasite representative of this group.

Parasitic helminths, or worms of humans, belong to two phyla: Nematoda (roundworms) and Platyhelminthes (flatworms).

- (1) Nematodes are among the most speciose and diverse animals. They are elongated and tapered at both ends, round in cross section, and unsegmented. They have only a set of longitudinal muscles, which allows them to move in a whiplike, penetrating fashion; a complete digestive system that is well adapted for ingestion of the host's gut contents, cells, blood, or cellular breakdown products; and a highly developed separate-sexed reproductive system. They shed their tough cuticles (molt) as they undergo development from larvae to adults, and the eggs and larval stages are well suited for survival in the external environment. Most human infections are acquired by ingestion of the egg or larval stage, but nematode infections can also be acquired from insect vectors and skin penetration.
- (2) Platyhelminthes are flatworms that are dorsoventrally flattened in cross section and are hermaphroditic, with a few exceptions. All medically important species belong to two classes: Trematoda (flukes) and Cestoda (tapeworms). Trematodes are typically flattened and leaf shaped with two muscular suckers. They have a bifurcated gut and possess both circular and longitudinal muscles; they lack the cuticle characteristic of nematodes and instead have a syncytial epithelium. Trematodes are hermaphroditic, with the exception of the schistosomes (blood flukes), which have male and female worms that exist coupled together within small blood vessels of their hosts. Cestodes, or tapeworms, are flat and have a ribbon-like chain of segments (proglottids) containing male and female reproductive structures. Adult tapeworms can reach lengths of 10 m and have hundreds of segments, with each segment releasing thousands of eggs. At the anterior end of an adult tapeworm is the scolex, which is often elaborated with muscular suckers, hooks, or structures that aid in its ability to attach to the intestinal wall. Adult tapeworms have no mouth or gut and absorb their nutrients directly from their host through their integument.

Parasite Antigen

Antigen are molecules that can be recognized by antibody or it is a molecules that can initiate immune response. Some times antigen are also called immunogen.

The biological and immunological activities of parasite antigens have been under investigation since the turn of the century and antigen-antibody interactions in helminthiasis, particularly, have been known to be many and complex. With improved techniques for antigenic analysis, Today we group parasitic immunogens into "functional" and "non-functional" antigens.

The functional antigens are the ones which has potential to induce immune system of host that interest us, and when we have isolated and characterized them fully we may be able to synthesize or attach a synthetic immunogenic group to a biological carrier for

- vaccination purposes.
- Diagnosis
- Taxonomic identification etc

As far as antigen of a parasite is concerned. Most part of parasite body has been used and evaluated for its antigenic potentials. But mostly secretory and excretory products are found most functional antigen which are capable of inducing immune system and are recognized by antibodies.

But despite of this fact parasites are still capable of evasion of immunity. Various mechanism which parasite uses are-

1. Anticomplementary activity
2. Antigenic disguise
3. Antigenic mimicry
4. Antigenic polymorphism
5. Immunomodulation of the host
6. Inaccessibility to effectors.