Parasitology:

. Parasitology is the branch of Science which mainly deals about all the Parasites and its infectious diseases. Parasitology covers mainly Parasites, Host and its association between them.

Parasite:

A living organism which receives nourishment and shelter from another organism where it lives is called parasites.

- A parasite does not necessarily cause disease.
- The parasite derives all benefits from the association and the host may either not be harmed or may suffer the consequences of this association, a parasite disease.
- A parasite is an organism that is entirely dependent on another organism, referred to as its host, for all or part of its life cycle and metabolic requirements.

Host: an organism which harbors the parasite.

Symbiosis:
An association in which both are so dependent upon each other that one can't live without the help of the other. None of the partners suffers any harm from the association.
The living together of two or more organism.

Commensalisms:
An association in which the parasite only is deriving benefit without causing injury to its host.

Parasitism:
An association in which the parasite derives benefit and the host gets nothing in return but always suffers some injury

Classes of parasites
Parasite are mainly classified into following two catagories;

Ecto-parasite (ectozoa): lives outside on the surface of the body of the host.

Endo-parasite (entozoa): lives inside the body of the host: in the blood, tissues, body cavities, digestive tract and other organs.

Temporary parasite: visits its host for a short period.

Permanent parasite: leads a parasitic life throughout the whole period of its life.

Facultative parasite: lives a parasitic life when opportunity arises.

Obligatory parasite: cannot exist without the parasitic life.

accidental parasite: attacks an unusual host.

Classes of host:

Definitive host (Final host) :
either harbors the adult stage of the parasite or where the parasite utilizes the sexual method of reproduction.

Intermediate host:
harbours the larval or asexual stages of the parasite.

In some cases larval developments are completed in two different intermediate hosts which are been referred to as **first and second intermediate hosts.**

Paratenic host (a carrier or transport host):
a host where the parasite remains viable without further development.

Nomenclature of parasites
Each parasite possesses two names i.e. a generic and a specific;ν
the former begins with an initial capital and the latter with an initial small letter, after which comes the designator's name, followed by punctuation and finally the year.ν
The generic and specific names are in italics but not the designator's name.ν
for example, the common intestinal roundworm of man is named Ascaris lumbricoides Linnaeus, 1758. This means that it belongs to the Genus Ascaris and the name of the species lumbricoides was given by Linnaeus in the year 1758.ν
[when the name assigned to the parasite is later transferred, the correct name is written as usual followed by the original name with the year in parenthesis]ν

Classification of parasites
The parasites which **medical men have to deal are divided into three main groups:**
1-Phylum Protozoa- single-celled organism, multiply in human host, *Medical Protozoology*
2-**Phylum Platyhelminthes (flat worm)**

3-Phylum Nemathelminthes (ring worm) - multicellular worms, do not normally multiply in human host, *medical Helminthology*.

4-Phylum Arthropoda – *Medical Entomology*

While describing animal parasites certain rules of zoological nomenclature are followed and each phylum may be further subdivided as follows:

Phylum
Sub-phylum
Super-class
Class
Sub-class
Order
Sub-order
Super-Family
Family
Sub-family
Genus and
species
Like above all parasites can be classified;

The biomedical discipline of Parasitology is concerned with the parasitic protozoa, helminths and arthropods.

Protozoa

Protozoal parasite consists of a single "cell-like unit" which is morphologically and functionally complete.

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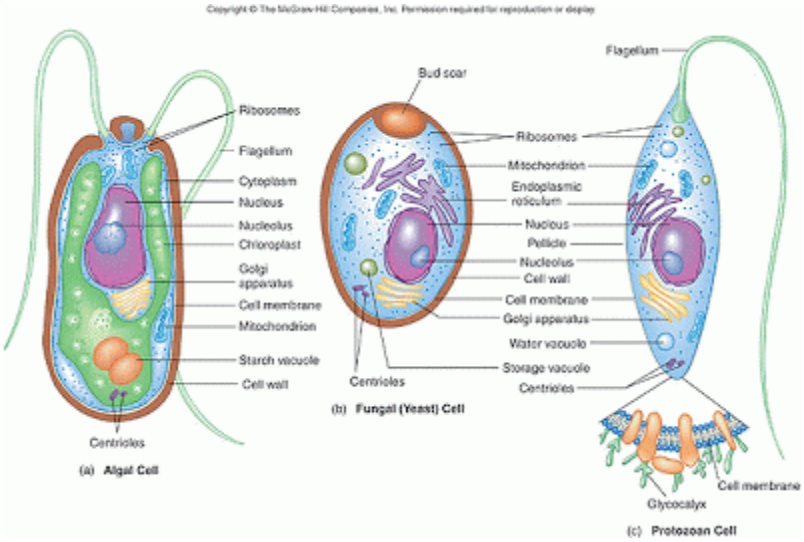
Structure of Protozoa:



Morphology

The structure of a protozoal cell is composed of;

1. Cytoplasmic body

2. Nucleus

Cytoplasm:

It may be divisible in to two portions:

1. **) Ectoplasm:** the external hyaline portion; its function is protective, locomotive and sensory.

Structures developed from ectoplasm

Organelles of locomotion

1. Pseudopodia: prolongation of temporary ectoplasmic process, seen in Rhizopodea (E. histolytica)
2. Flagella: long delicate thread-like filaments, seen in Zoomastigophorea. (Giardia intestinalis)
3. Cilia: fine needle-like filaments covering the entire surface of

the body, seen in Ciliatea. (B. coli)

4. Contractile vacuoles: situated inside the endoplasm; excretory function.

5. Rudimentary digestive organ, such as cytostome (cell mouth) and cytopharynx, seen in Balantidium coli.
6. Cyst wall: a thickened resistant wall, seen in the cystic stage

2. **) Endoplasm:** the internal granular portion; its function is nutritive and reproductive

SuperClass :

1)Sarcodina:

- They are all typically amoeboid and include Entamoeba, Endolimax, Iodamoeba, , etc. amoebae consist of a shapeless mass of moving cytoplasm which is divided in to granular endoplasm and clear ectoplasm.
- They move by pushing out the ectoplasm to form pseudopodia (false
- feet) into which the endoplasm then low.
- Amoebae reproduce asexually by simply dividing into two (binary fission)
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- **2) Ciliophora:**
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- These are the complex protozoa bearing cilia (short hairs) distributed in rows or patches by which they move.
- They have two kinds of nuclei (macronucleus and micronucleus) and a large contractile vacoule.
- Balantidium coli, a giant intestinal ciliate of humans and pigs, is the only human parasite representative of this group.
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3)Mastigophora:

- All are flagellates.

- They have one or more whip like flagella for locomotion at some stage of their life cycle. In some cases, there is the presence of undulating membrane (Eg. Trypanosoma).
- The mastigophore includes the intestinal and genitourinary flagellates and the blood and tissue flagellates.
- The intestinal and genitourinary flagellates are Giardia, Trichomonas, Dientamoeba, Chilomastik, etc.
- The blood and tissue flagellates are Trypanosoma, Leishmania, etc.
- They reproduce asexually by binary fission.

- **4)Sporozoa:**
- The members of this super-class undergoes complex life cycle with alternating sexual and asexual reproductive phases involving two different hosts.
- Coccidia are intacellular parasites that reproduce asexually by a process called schizogony (merogony) and sexually by sporogony.
- Class Coccidia includes Isospora and Toxoplasma and class Haematozoa includes the malarial parasites-Plasmodium species.