

Tikrit University

College of Nursing

Basic Nursing Sciences



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Microbiology

Parasitology

By: assistant lecturer

Ayat Munaf Hameed

BIOLOGY

Biology: The scientific study of life or science which studies life. Major branches of biology

1-Macro-biology:

Science which deals or studies all macro-organism which can be seen by naked eyes. These sciences are.

A - Zoology:

Science which is studies the animals.

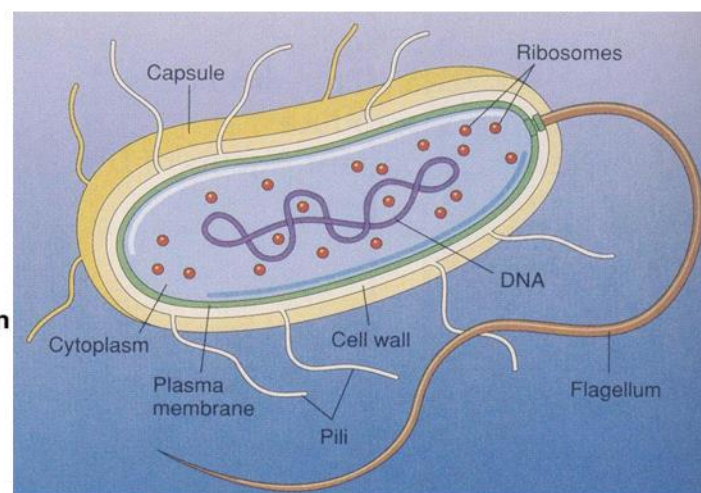
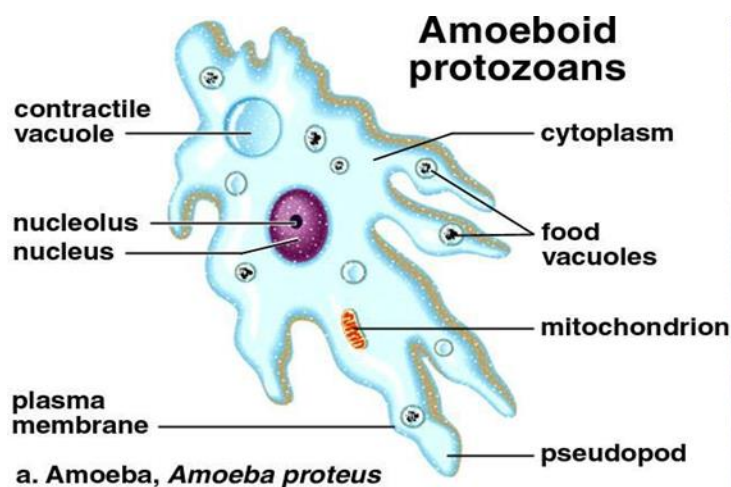
B -Botany:

Science which is studies the plants.

2- Micro-biology: Science which deals with or studies all micro- organism which can not be seen by naked eyes (All unicellular micro-organisms).

A- Eukaryotes: (True nucleus), such as fungi, protists, and parasites

B- prokaryotes: No true nucleus Like bacteria



GENERAL PARASITOLOGY

ASSOCIATION BETWEEN PARASITE AND HOST

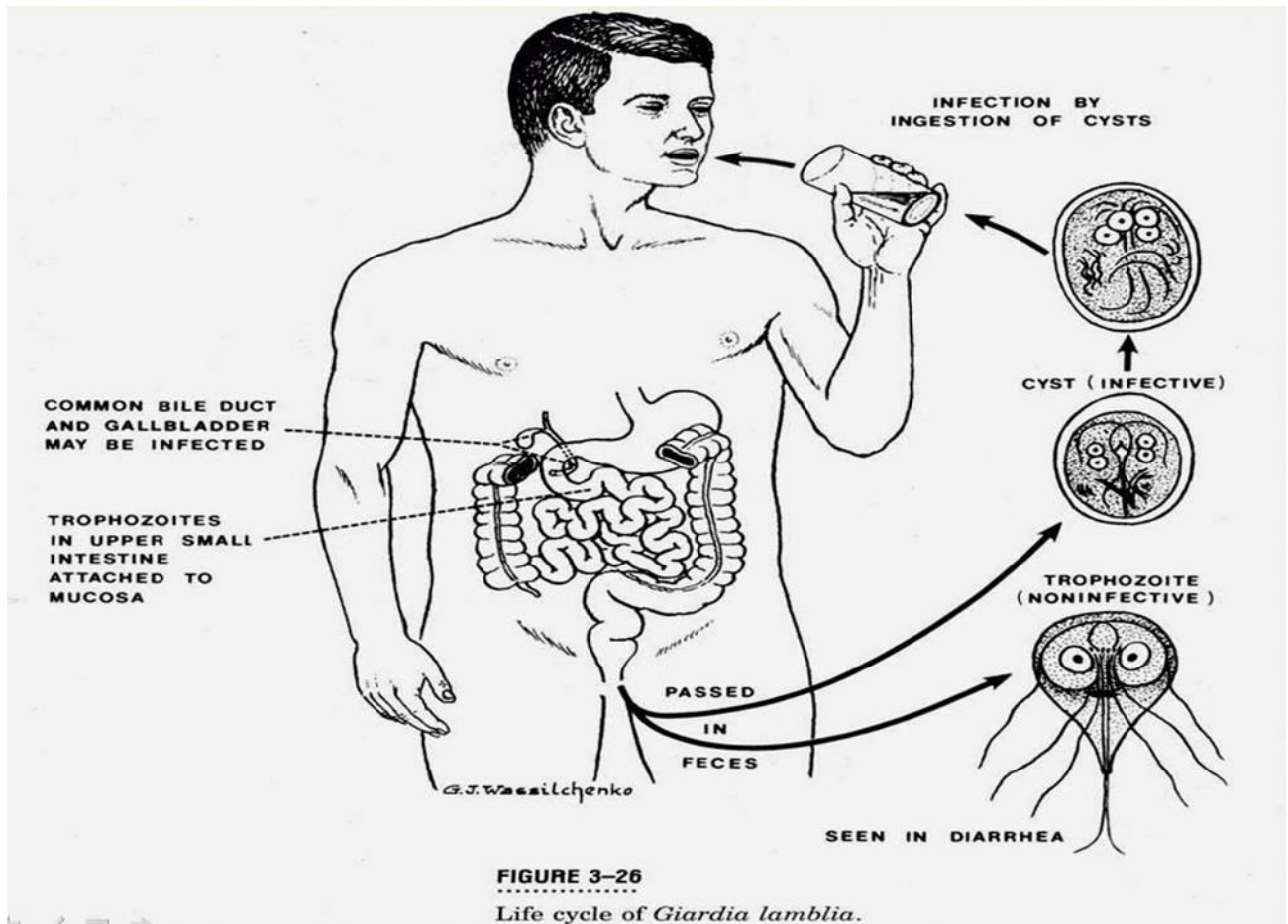
A parasite is a living organism, which takes its nourishment and other needs from a host; the host is an organism which supports the parasite. The parasites included in medical parasitology are protozoa, helminthes, and some arthropods.

The hosts vary depending on whether they harbor the various stages in parasitic development.

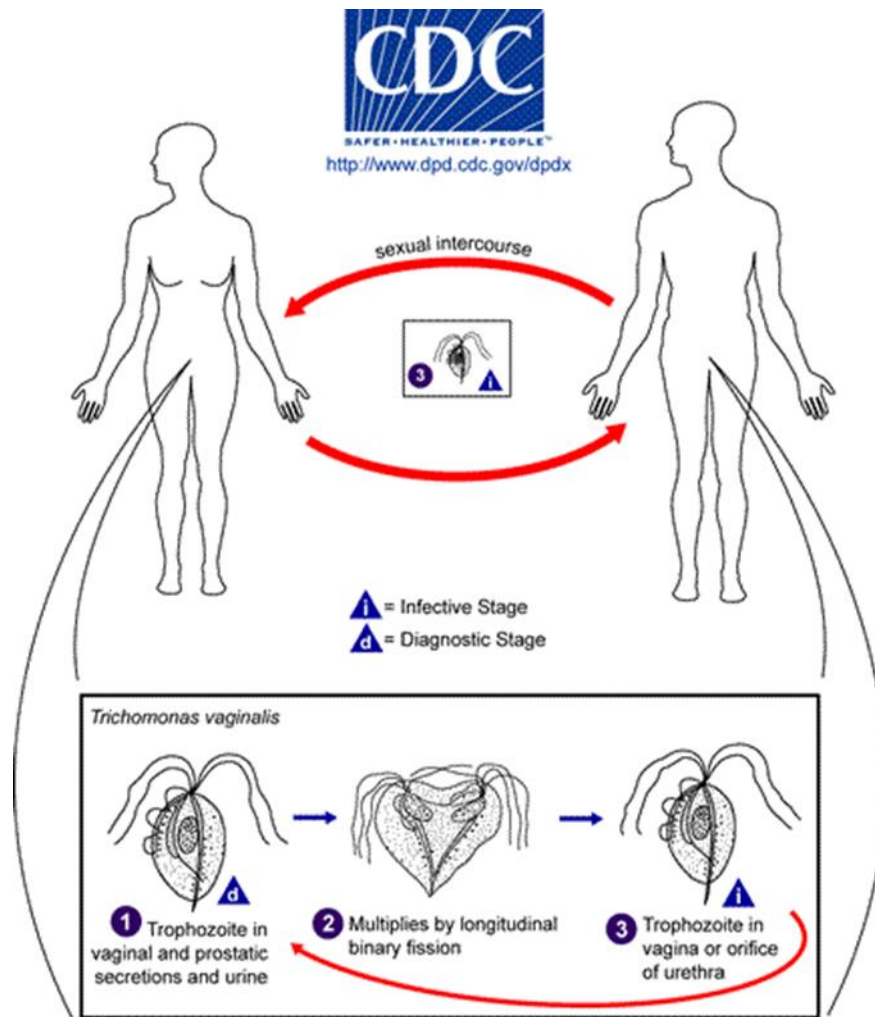
- Ectoparasite – a parasitic organism that lives on the outer surface of its host, e.g. lice, ticks, mites etc.
- Endoparasites – parasites that live inside the body of their host, e.g. *Entamoeba histolytica*.
- Obligate Parasite - This parasite is completely dependent on the host during a segment or all of its life cycle, e.g. *Plasmodium* spp.
- Facultative parasite – an organism that exhibits both parasitic and non-parasitic modes of living and hence does not absolutely depend on the parasitic way of life, but is capable of adapting to it if placed on a host. E.g. *Naegleria fowleri*
- Accidental parasite – when a parasite attacks an unnatural host and survives. E.g. *Hymenolepis diminuta* (rat tapeworm).
- Erratic parasite - is one that wanders in to an organ in which it is not usually found. E.g. *Entamoeba histolytica* in the liver or lung of humans.

Most of the parasites which live in/on the body of the host do not cause disease

(non-pathogenic parasites). In Medical parasitology we will focus on most of the disease causing (pathogenic) parasites. However, understanding parasites which do not ordinarily produce disease in healthy (immunocompetent) individuals but do cause illness in individuals with impaired defense mechanism (opportunistic parasites) is becoming of paramount importance because of the increasing prevalence of HIV/AIDS in our country.



Life cycle may be direct life cycle (without intermediate host or vector), Indirect life cycle (needed intermediate hosts or vector).



Route and mode of infection

- 1- Orally: Most prominent route, the infective stage enters with contaminated food or water.
- 2- Respiratory system: eggs of some helminths like pin-worm may

enter through inhalation the air carried the eggs.

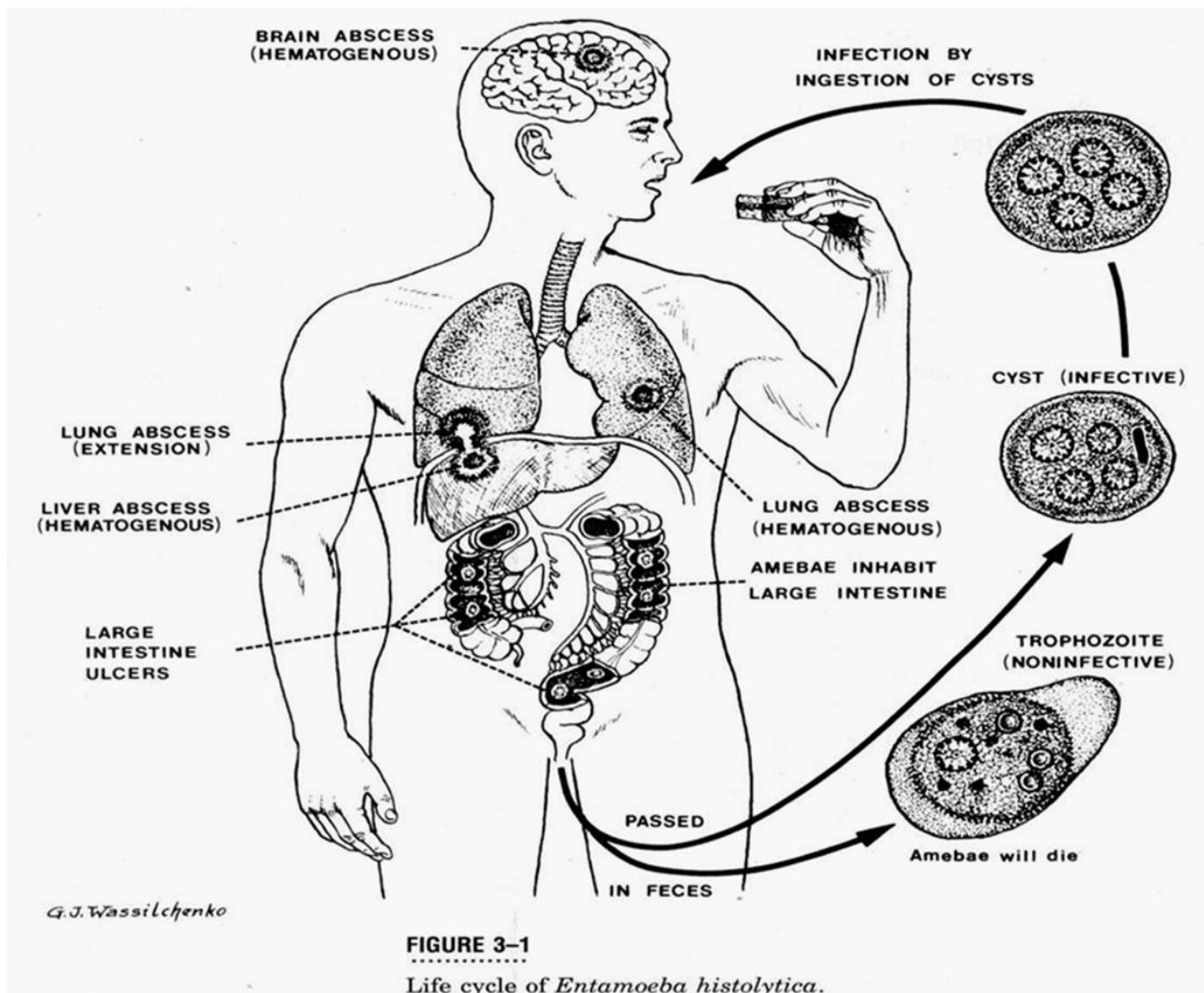
3- Skin: Infective stage of parasites penetrated directly by the parasite itself (ex. *Schistosoma. cercaria*) or inoculated by vector insect bite. (ex. *Plasmodium spp.*).

4- Placentally: From the mother to infant through the placenta (ex: *Toxoplasma spp.*).

5- blood transfusion: Through blood stream.

6- sexually: By sexual intercourse

7- Contaminated syringes. drugs addiction.



- **Definitive host** – a host that harbors a parasite in the adult stage or where the parasite undergoes a sexual method of reproduction.

• **Intermediate host** - harbors the larval stages of the parasite or an asexual cycle of development takes place. In some cases, larval development is completed in two different intermediate hosts, referred to as first and second intermediate hosts.

• **Paratenic host** – a host that serves as a temporary refuge and vehicle for reaching an obligatory host, usually the definitive host, i.e. it is not necessary for the completion of the parasites life cycle.

• **Reservoir host** – a host that makes the parasite available for the transmission to another host and is usually not affected by the infection.

• **Natural host** – a host that is naturally infected with certain species of parasite.

• **Accidental host** – a host that is under normal circumstances not infected with the parasite.