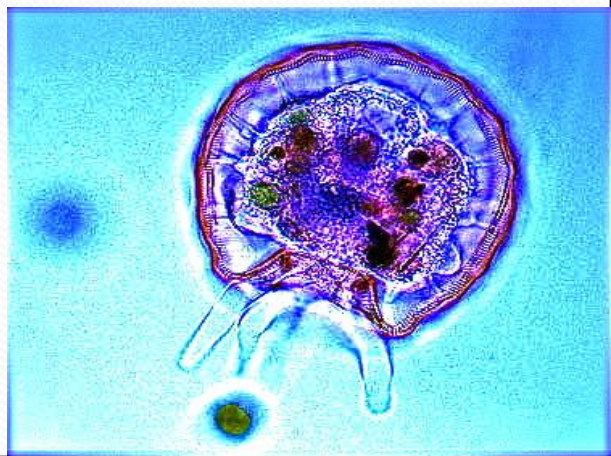
علم الأحياء الدقيقة

Microbiology

Introduction to Protozoology



Animal-Like Protista- Protozoa

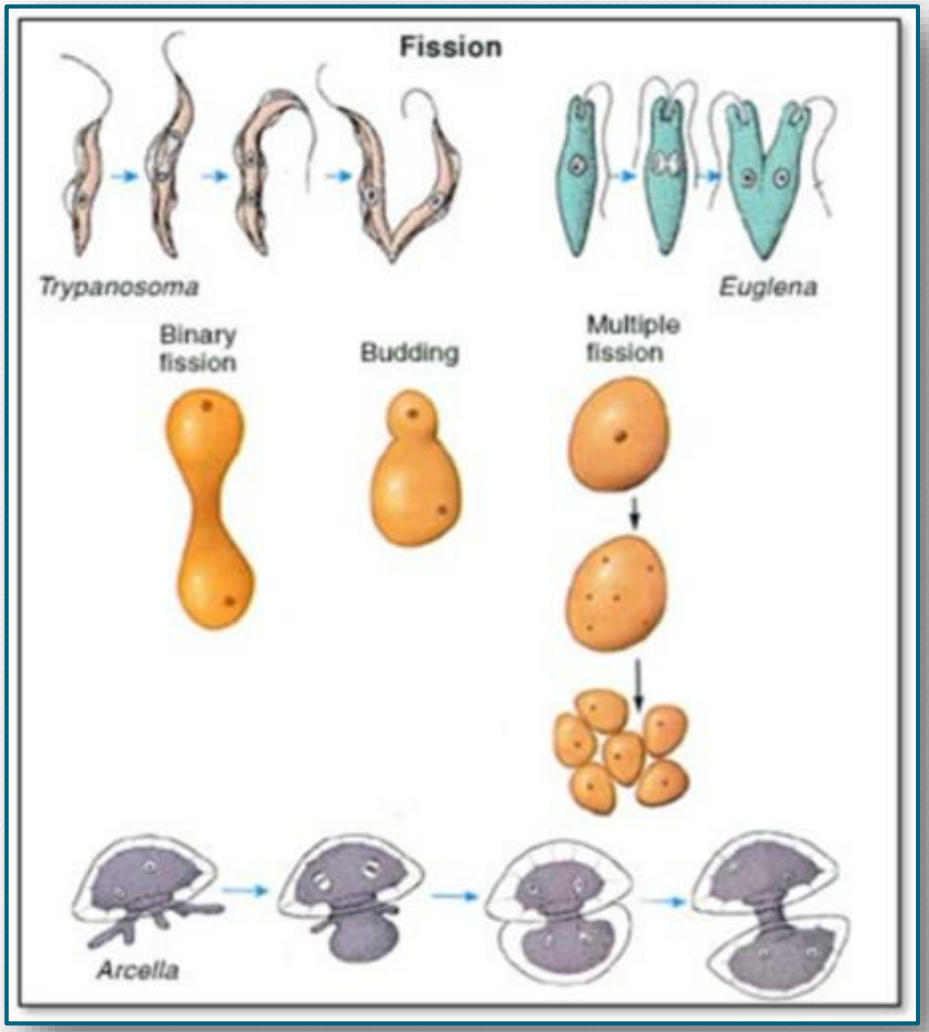
- All are unicellular heterotrophs.
- Nutrition by ingesting other organisms or dead organic material.
- Some organisms are parasitic, since they cannot actively capture food. They must live in an area of the host organism that has a constant food supply, such as the intestines or bloodstream of an animal.

- The protozoans are grouped on the basis of their modes of locomotion to:

1. Pseudopods	**2. Flagellates**	**3. Ciliates**	**4. Sporozoans**
move by psedupodia such as	move by flagella such as	move by cilia such as	do not move such as
Amoeba	***Giardia***	***Paramecium***	***Plasmodium***

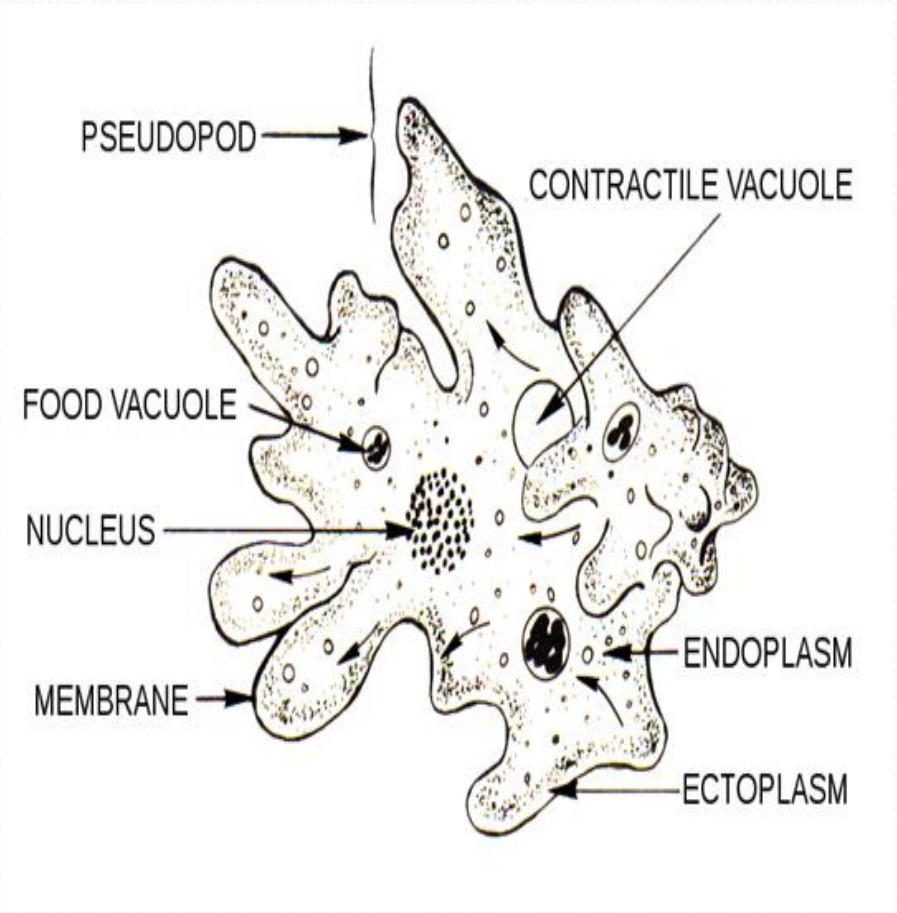
Animal-Like Protista- Protozoa

Reproduction:



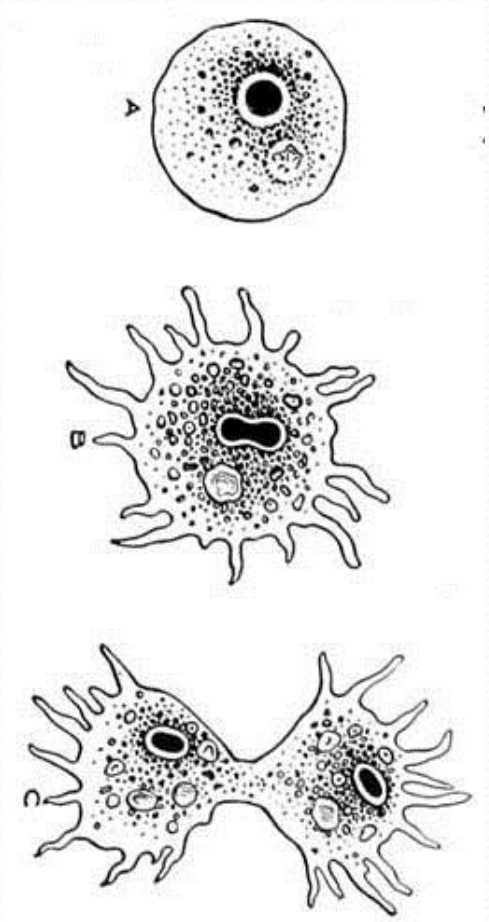
Pseudopods
e.g *Amoeba*

- Have no wall outside of their cell membrane.
- Use extensions of their cell membrane (called pseudopodia) to move, as well as, to engulf food.
- Amoebas live in water, dissolved nutrients from the environment can diffuse directly through their cell membranes.
- Most amoebas live in marine environments**,** although some freshwater species exist.
- Freshwater amoebas use contractile vacuoles to pump excess water out of the cell.



Pseudopods
e.g *Amoeba*

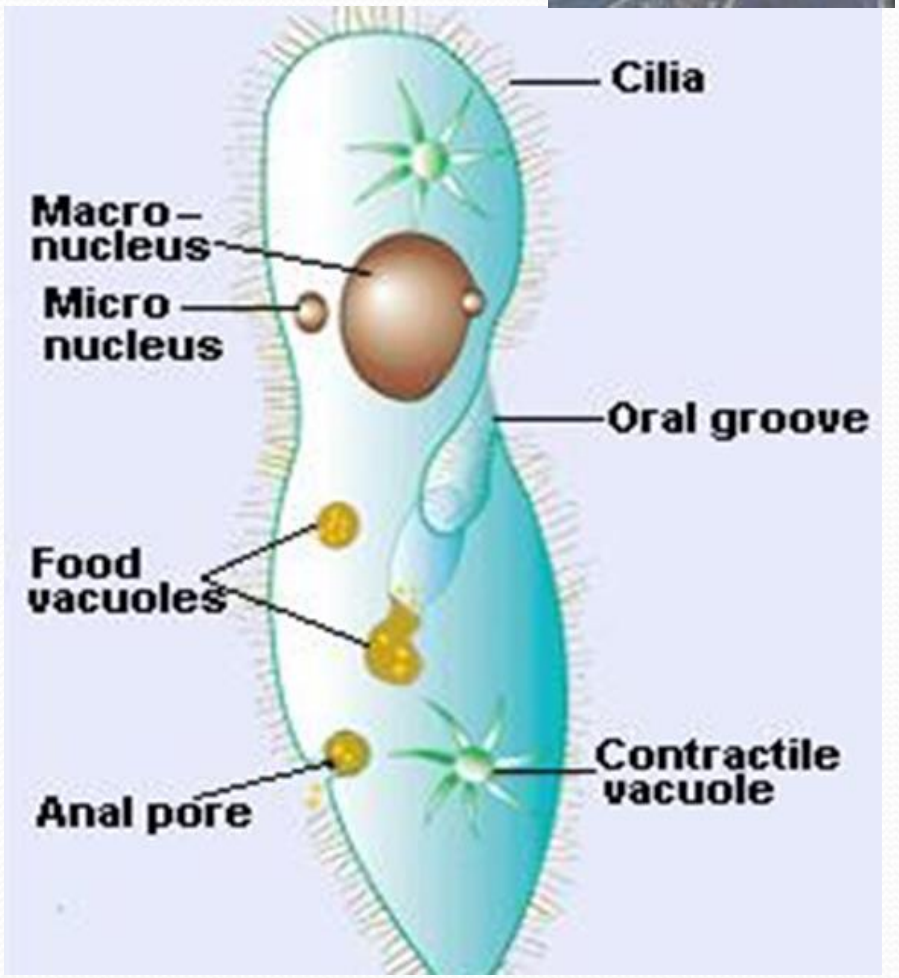
- Most amoebas reproduce asexually by fission
- Amoebas may form cysts when environmental conditions become unfavorable.
- Two forms of amoebas have shells, the foraminiferans and the radiolarians.
- Foraminiferans have a hard shell made of **calcium carbonate**.
- Radiolarians have shells made of **silica**.
- Both organisms have many tiny holes in their shells, through which they extend their pseudopodia.
- **Feeding:** When the pseudopodium traps a bit of food, the cell membrane closes around the meal, this forms a food vacuole.
- Digestive enzymes are secreted into the food vacuole, which break down the food. The cell then absorbs the nutrients.



Reproduce asexually by fission

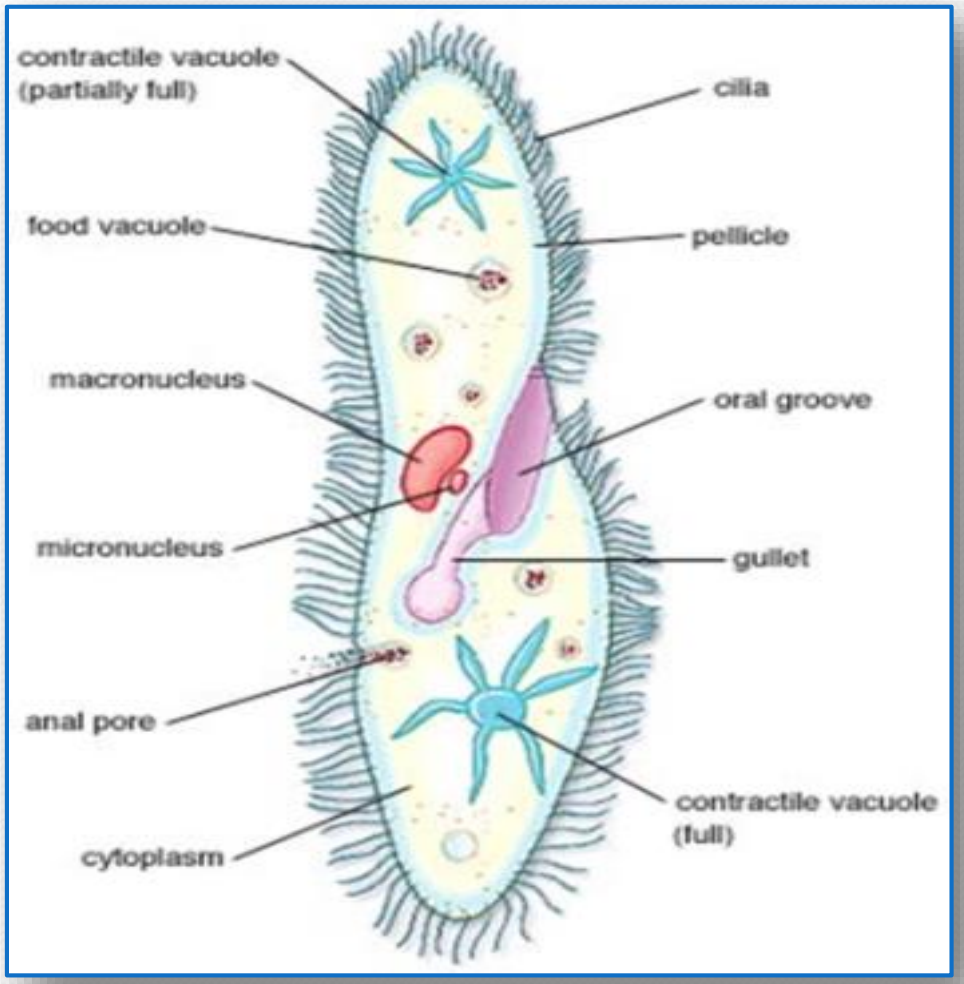
Ciliated Protozoa
e.g Paramecium

- Move by the cilia covering their bodies.
- They can be found almost anywhere, in freshwater or marine environments.
- Probably the best-known ciliate is the organism ***Paramecium***.



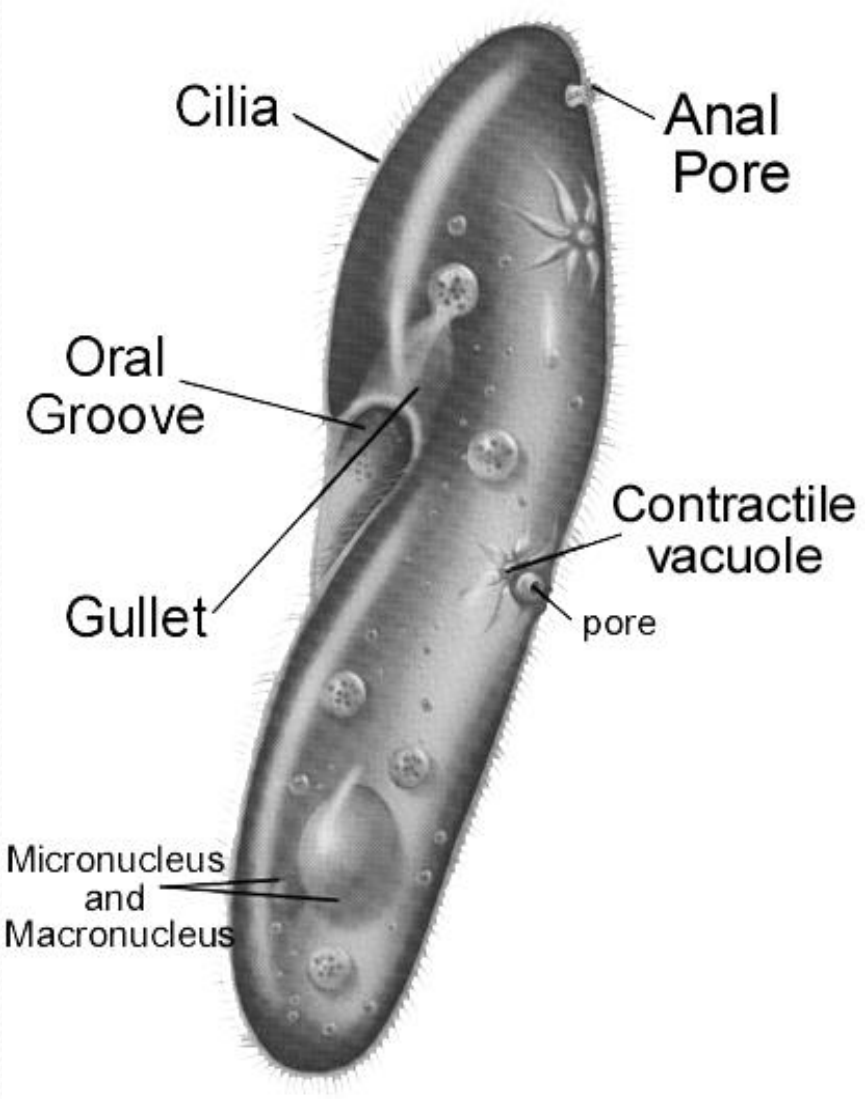
Ciliated Protozoa
e.g Paramecium

- Paramecia have many well-developed organelles.
- Paramecia have two nuclei, a macronucleus and a micronucleus.
- The larger macronucleus controls most of the metabolic functions of the cell.
- The smaller micronucleus controls much of the pathways involved in **sexual reproduction**.
- Thousands of cilia appear through the pellicle, a tough, protective covering surrounding the cell membrane.



Feeding:

- Food enters the cell through the oral groove (lined with cilia, to "sweep" the food into the cell), where it moves to the gullet, which packages the meal into a food vacuole.
- Enzymes released into the food vacuole break down the food, and the nutrients are absorbed into the cell.
- Wastes are removed from the cell through an anal pore.
- Contractile vacuoles pump out excess water, since paramecia live in freshwater surroundings.



Ciliated Protozoa
e.g Paramecium

- Paramecia usually reproduce asexually, by **transverse fission**.
- When conditions are unfavorable, however, the organism can reproduce sexually.
- This form of sexual reproduction is called **conjugation**.
- During conjugation, two paramecia join at the oral groove, where they exchange genetic material.
- They then separate and divide asexually.

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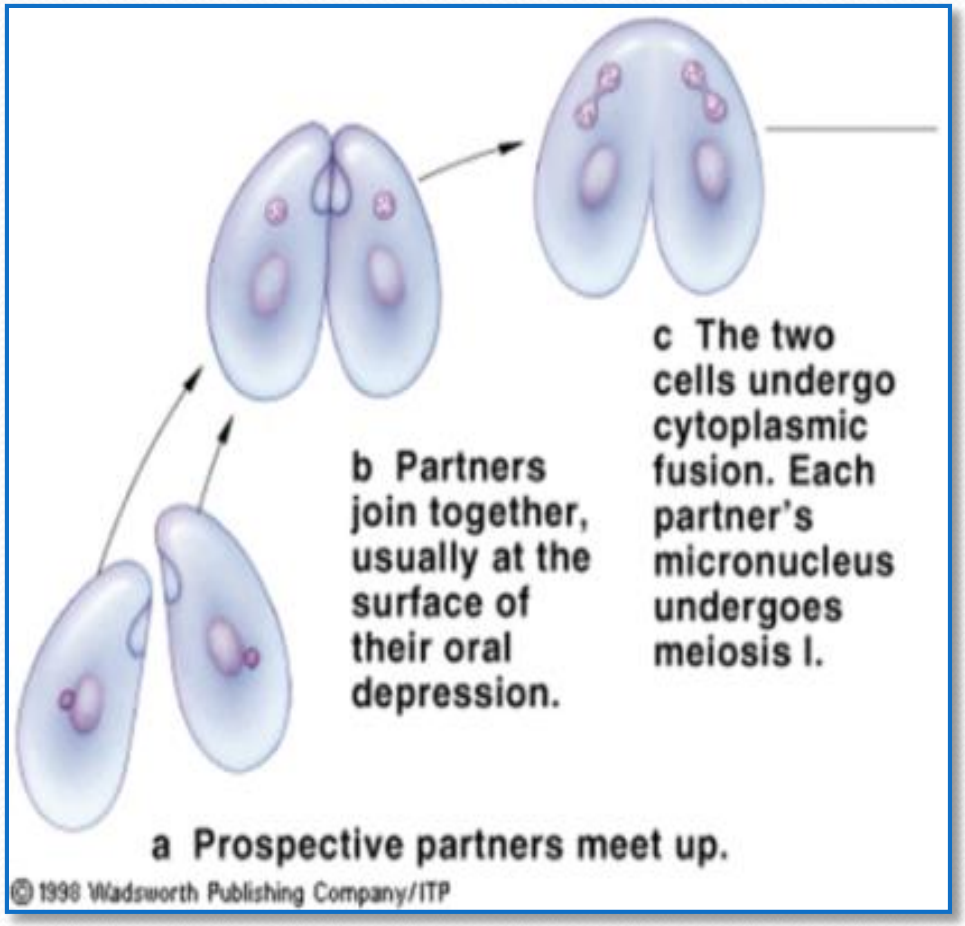
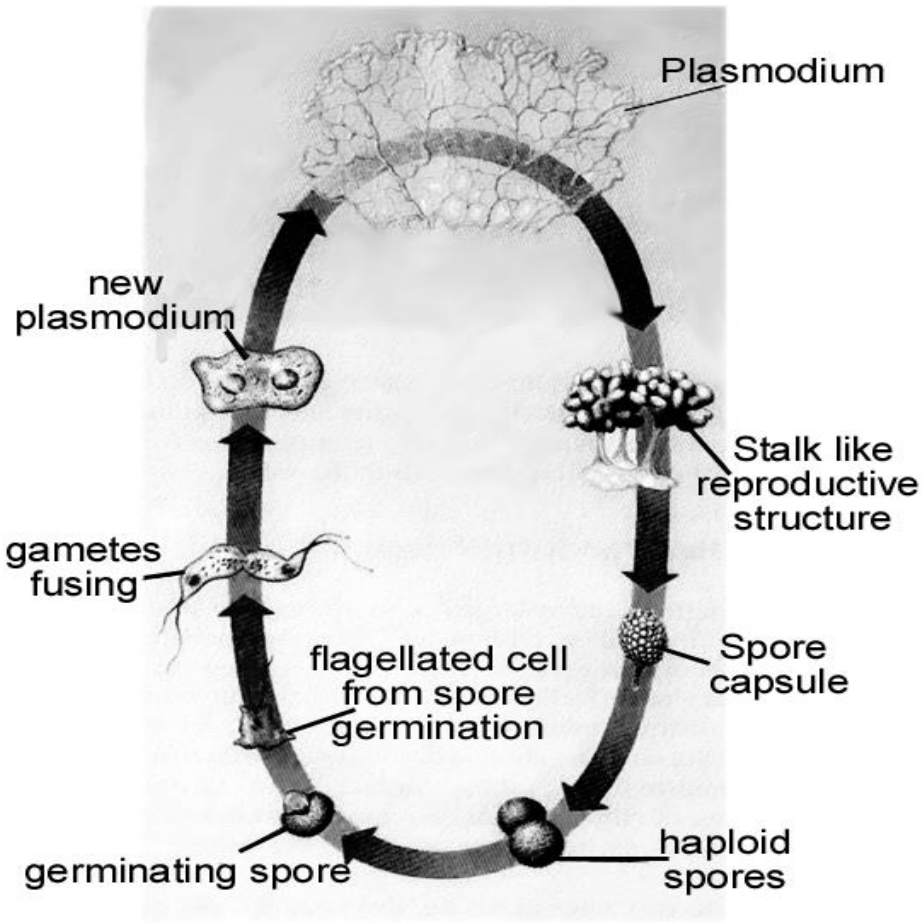


Sporozoans Protozoa e.g *Plasmodium*

- Sporozoans are all **Parasites** e.g ***Plasmodium***
- Many of these organisms produce spores, reproductive cells that can give rise to a new organism.
- Sporozoans typically have complex life cycles, as they usually live in more than one host in their lifetimes.



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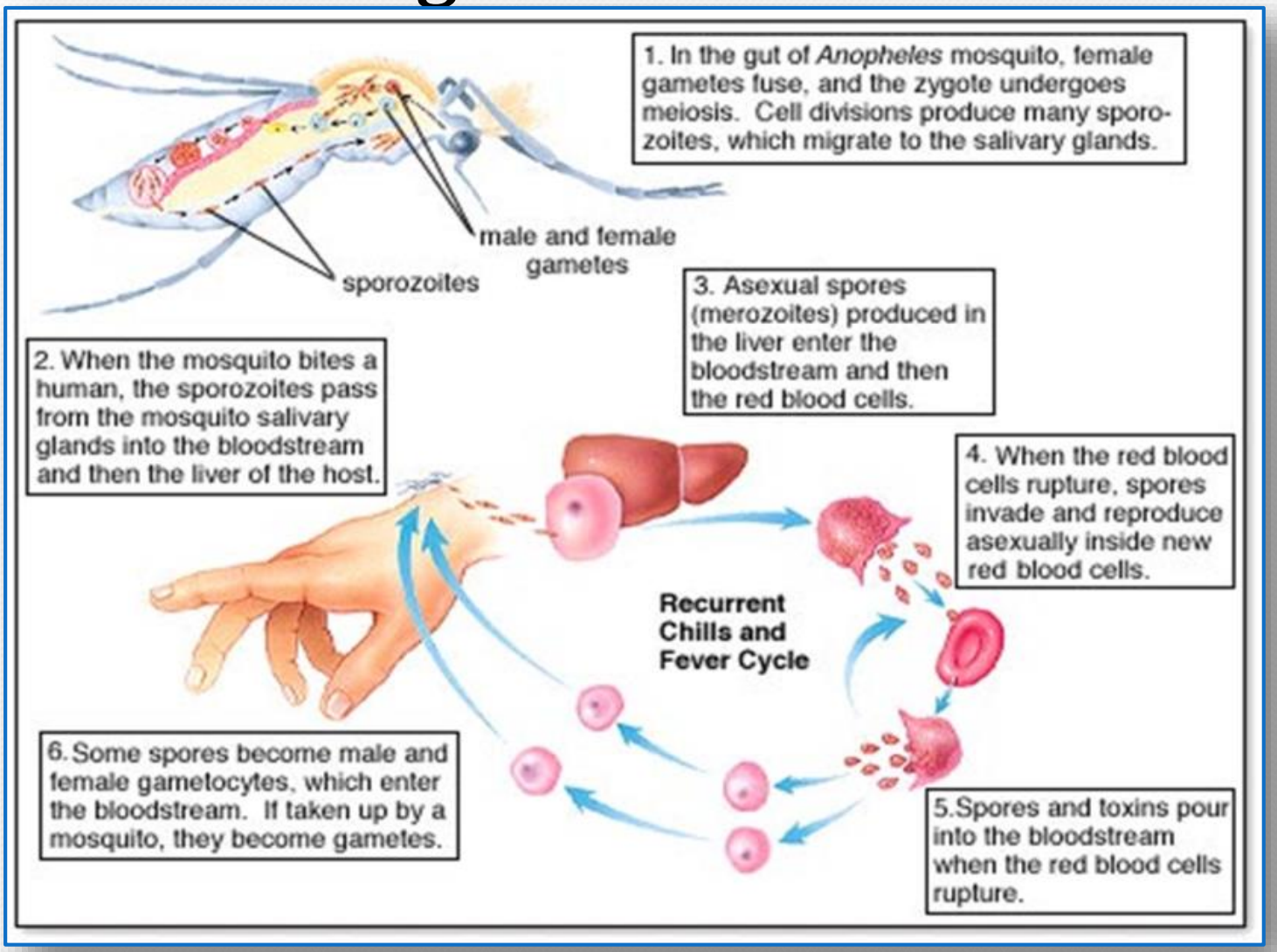
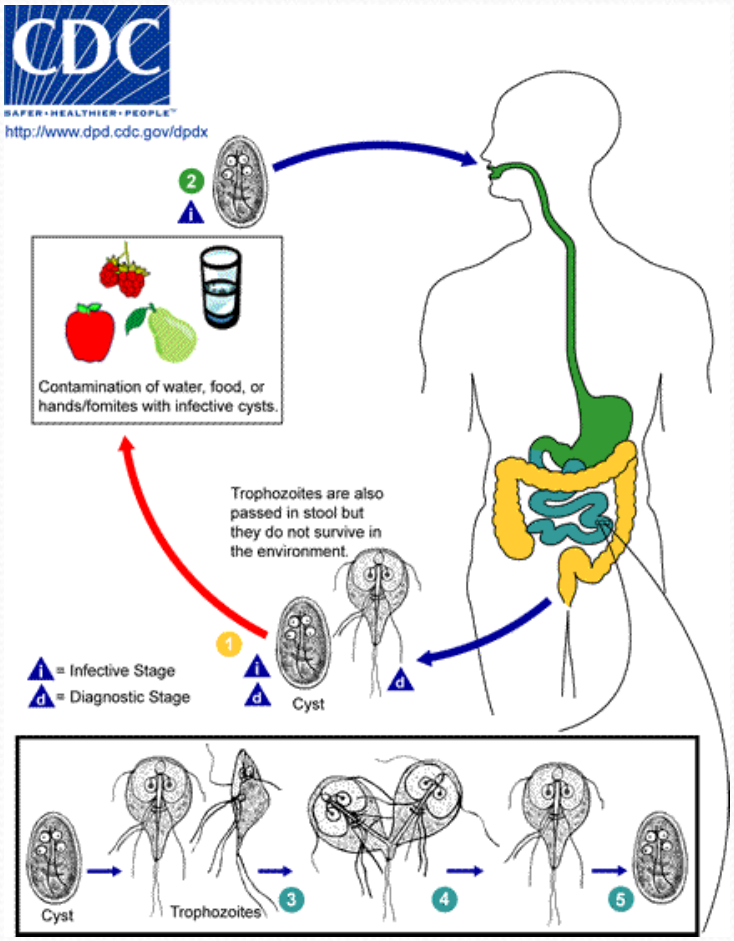
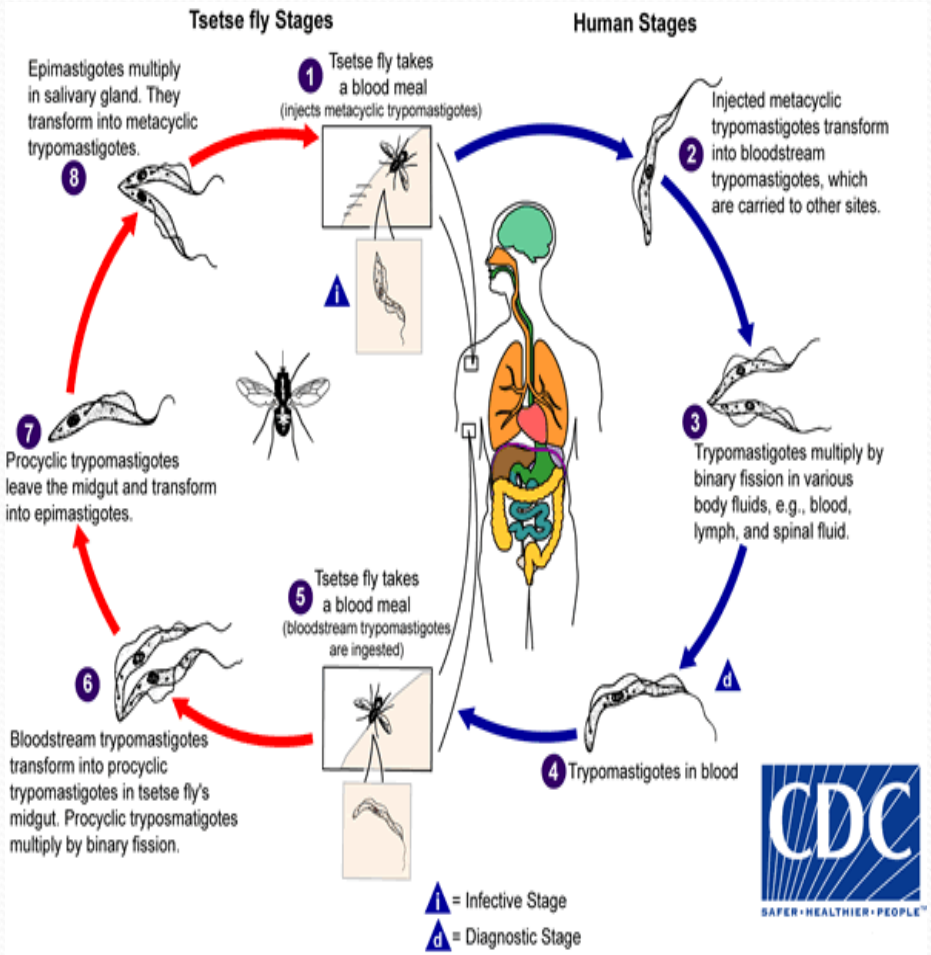


Flagellates Protozoa
e.g *Giardia* & *Trypanosoma*





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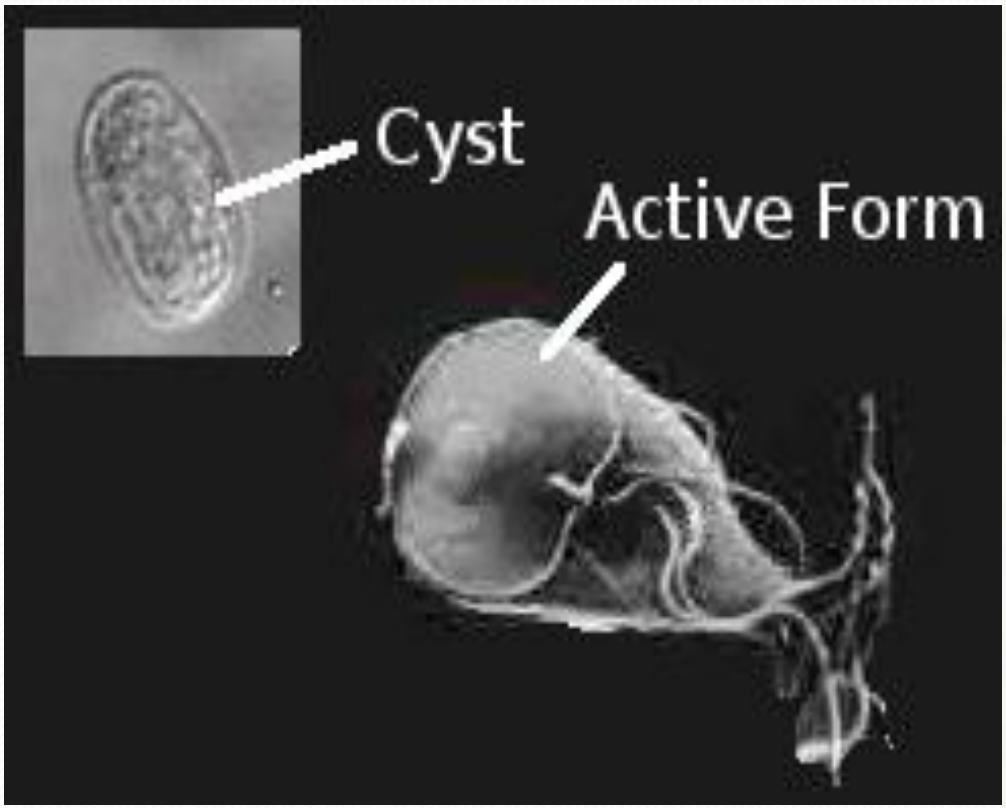

QUESTIONS??