

Al-Mustaqbal University college
Department of pharmacy



2 st Class, 2 st Semester

parasitology

Lab 2

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• Classification of parasites

divided into three main groups:

A –Protozoa single-celled organism, multiply in human host, All protozoans have 2 important stages of life:

Trophozoite and Cyst

1-phylum: Sarcomastigophora

a- subphylum: Sarcodina

b-subPhylum: mastigophora

2- Phylum: Ciliophora

3- Phylum: Sporozoa

B-Helminthes

(worms) multicellular worms, do not normally multiply in human host

1- Phylum: platyhelminthes

الديدان المسطحة

2- Phylum:

Nematoda

الديدان الخيطية

3- Phylum:

Acanthocephala

الديدان شوكية الراس

C-Arthropoda

multicellular worms, do not normally multiply in human host

1- Phylum: insecta

الحشرات

2- Phylum:

Archneida العناكب

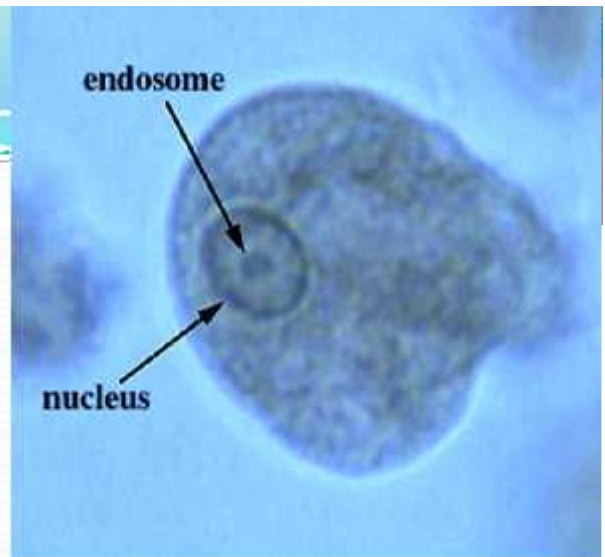
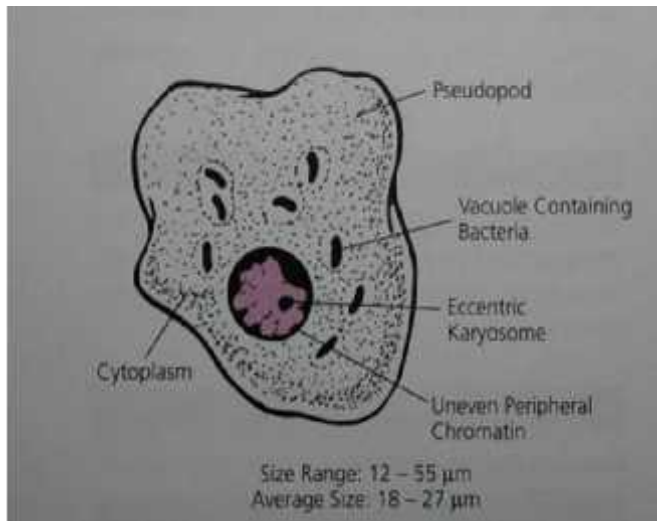
Subkingdom: Protozoa;
Phylum: Sarcomastigophora;
subphylum Sarcodina

Entamoeba histolytica

Kingdom **Animalia**
Subkingdom **Protozoa**
Phylum
Sarcomastigophora
subphylum **Sarcodina**
Class **Lobosea**
Order **Amoebida**
Family **Endamoebidae**
Genus **: Entamoeba**
Species **: histolytica**

Entamoeba coli

Kingdom **Animalia**
Subkingdom **Protozoa**
Phylum
Sarcomastigophora
subphylum **Sarcodina**
Class **Lobosea**
Order **Amoebida**
Family **Endamoebidae**
Genus **: Entamoeba**
Species **: coli**



Trophozoites

Entamoeba coli

15 μm - 40 μm in size

Multiple pseudopodia

Non directional motility

No ingested erythrocytes

Cytoplasm rough looking

Large, eccentric karyosome

Clumped nuclear chromatin

Entamoeba histolytica

10 μm - 35 μm size

Single pseudopodia

Unidirectional motility

Ingested erythrocytes (RBC)

Finely granular cytoplasm

Small, central karyosome

Finely beaded chromatin



Cysts

Entamoeba coli

10 μm - 35 μm in size

May have 8 nuclei

Karyosomes eccentric

Nuclear chromatin clumped

Splintered chromatoidal bars

Entamoeba histolytica

10 μm - 20 μm in size

Never more than 4 nuclei

Karyosomes small, central

Chromatin finely beaded

Rounded chromatoidal bars

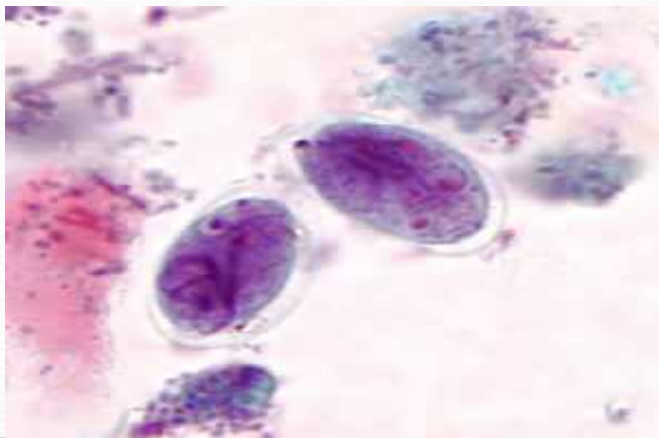
Subkingdom: Protozoa;
Phylum: Sarcomastigophora;
Subphylum: Mastigophora

- **Taxonomical Classification of Giardia lamblia**

Kingdom	Protista
Subkingdom	Protozoa
Phylum	Sarcomastigophora
Subphylum	Mastigophora
Class	Zoomastigophora
Order	Diplomonadida
Family	Hexamitidae
Genus	<u>Giardia</u>
Species	<u>lamblia</u>

Giardia lamblia

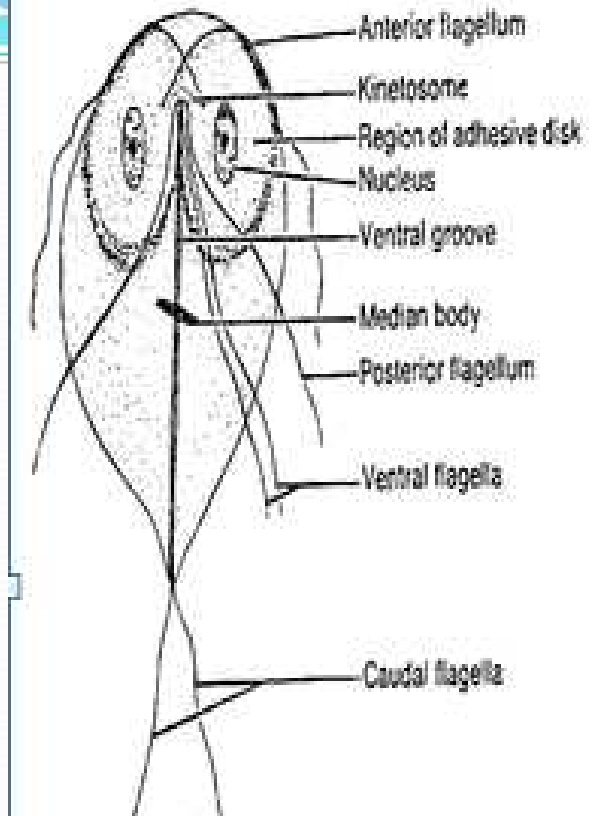
- It is the most common flagellate of the intestinal tract.
- considered as one of the most common cause of infectious **diarrhea** throughout the world.
- **Geographical Distribution:** Worldwide (tropical and subtropical region)
- Humans are the only important reservoir of the infection.
- **Causes Giardiasis**, also called “traveler’s diarrhea” or “beaver fever”
- **Morphology:** exhibit the trophozoite and cyst .



Trophozoite

- pear or pyriform shaped
- found in diarrheic stool
- rounded anteriorly and pointed posteriorly
- bilaterally symmetrical
- looking like tennis rackets without the handle
- Divide by binary fission
- sucking disc (used for attachment of jejunal or duodenal mucosa)
- Motility by 4 pairs of flagellae 2 ventral and 2 caudal
- Two oval nuclei with central karyosome
- Two axostyle traversing the body
- Two rod-shaped parabasal bodies across the axostyle

Trophozoite, ventral view



Trophozoite

14 x 7 μm

Sucking disc

Blepharoplasts

2 nuclei

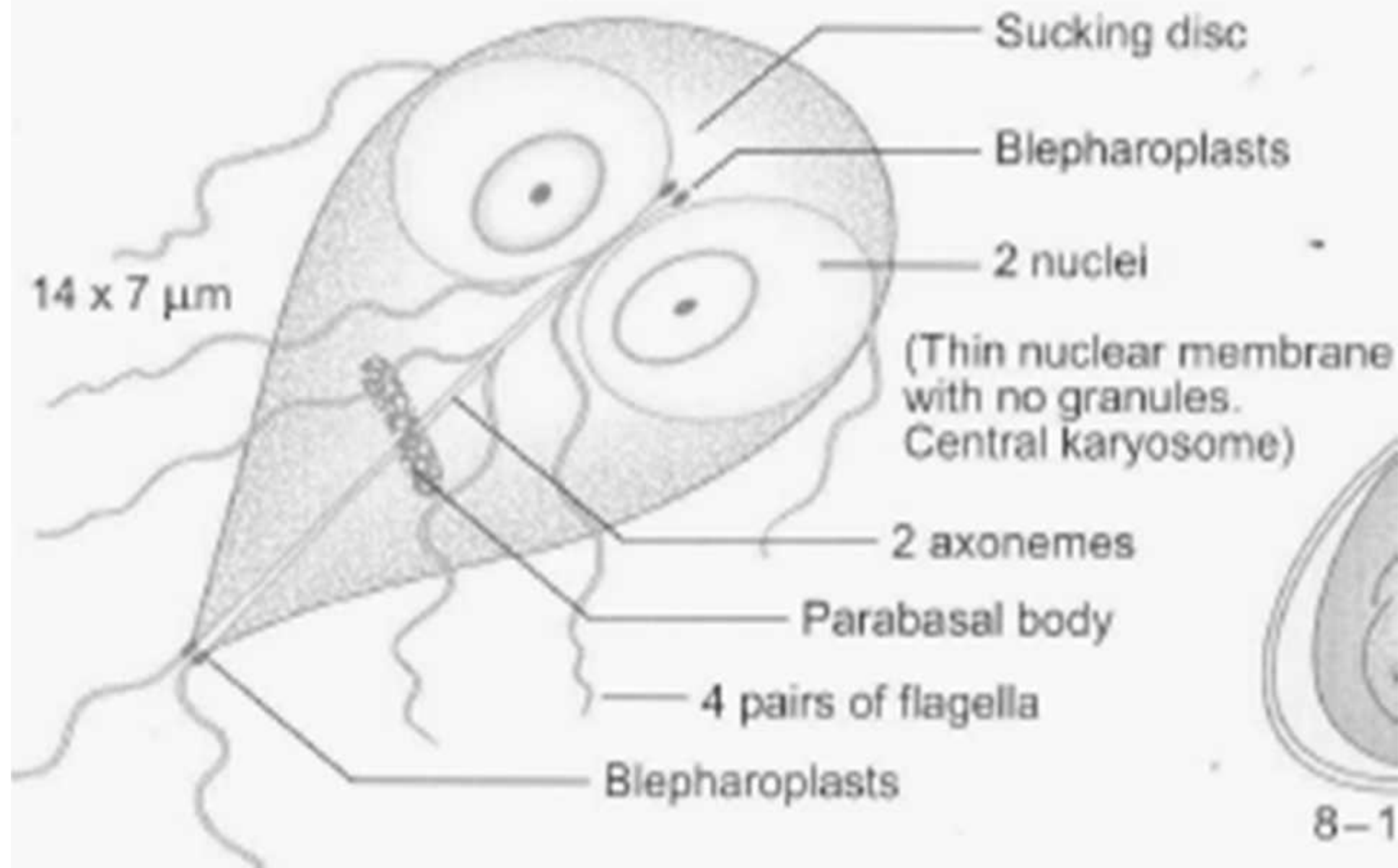
(Thin nuclear membrane with no granules.
Central karyosome)

2 axonemes

Parabasal body

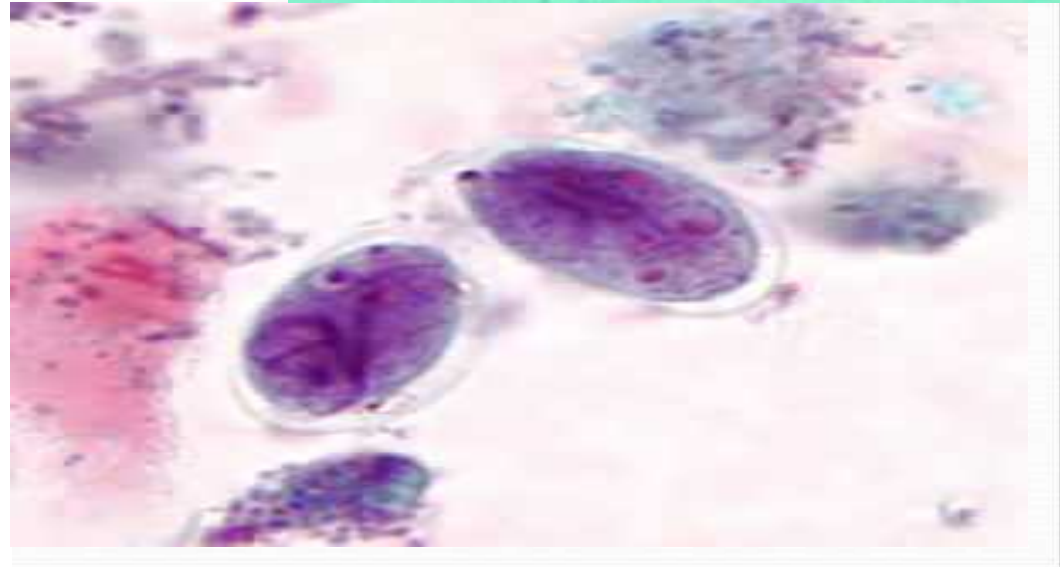
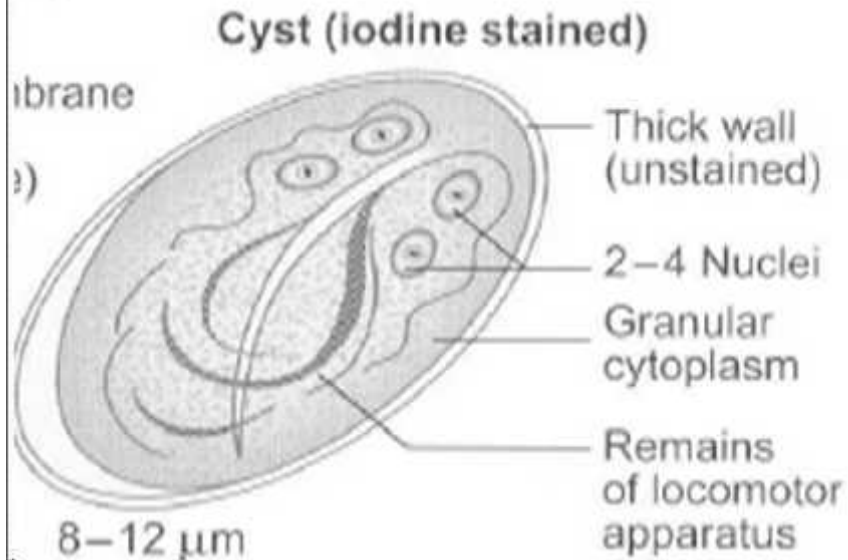
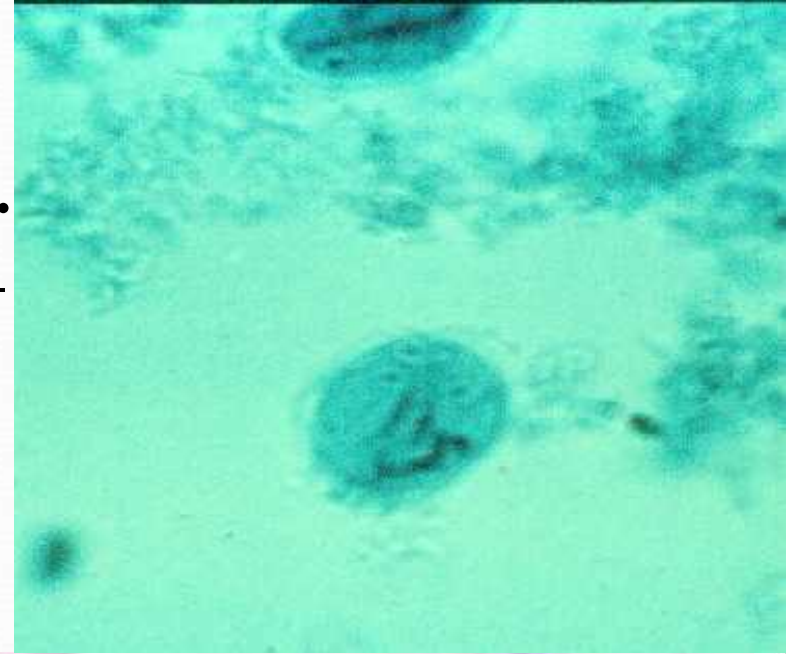
4 pairs of flagella

Blepharoplasts

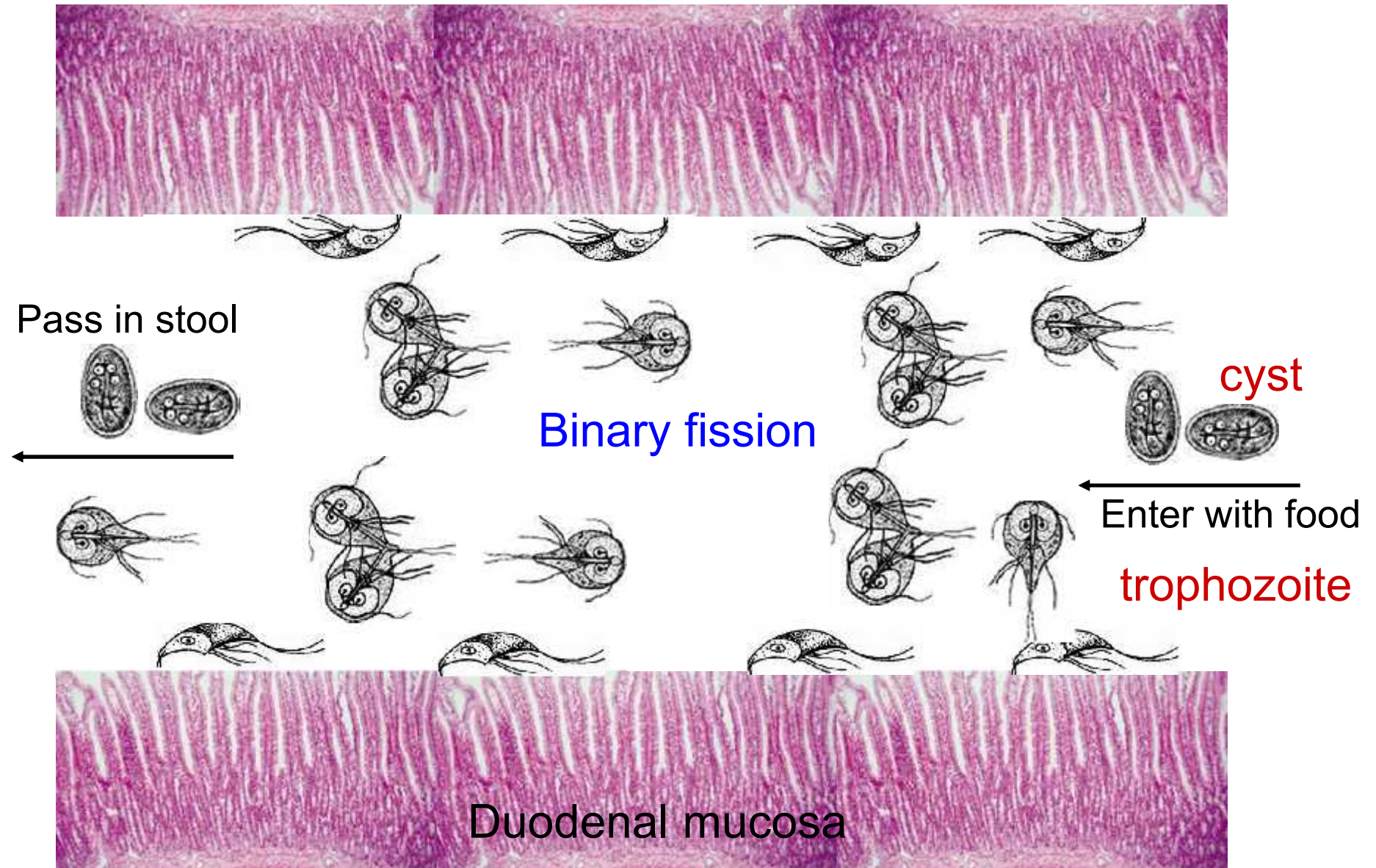


Cyst

- Average size 12 X 7 μ
- Oval with well defined cyst wall
- Four nuclei present usually at one pole.
- Includes: axostyle – parabasal bodies – remnants of flagella
- Habitat: duodenum and jejunum
- Mature cyst is the infective stage

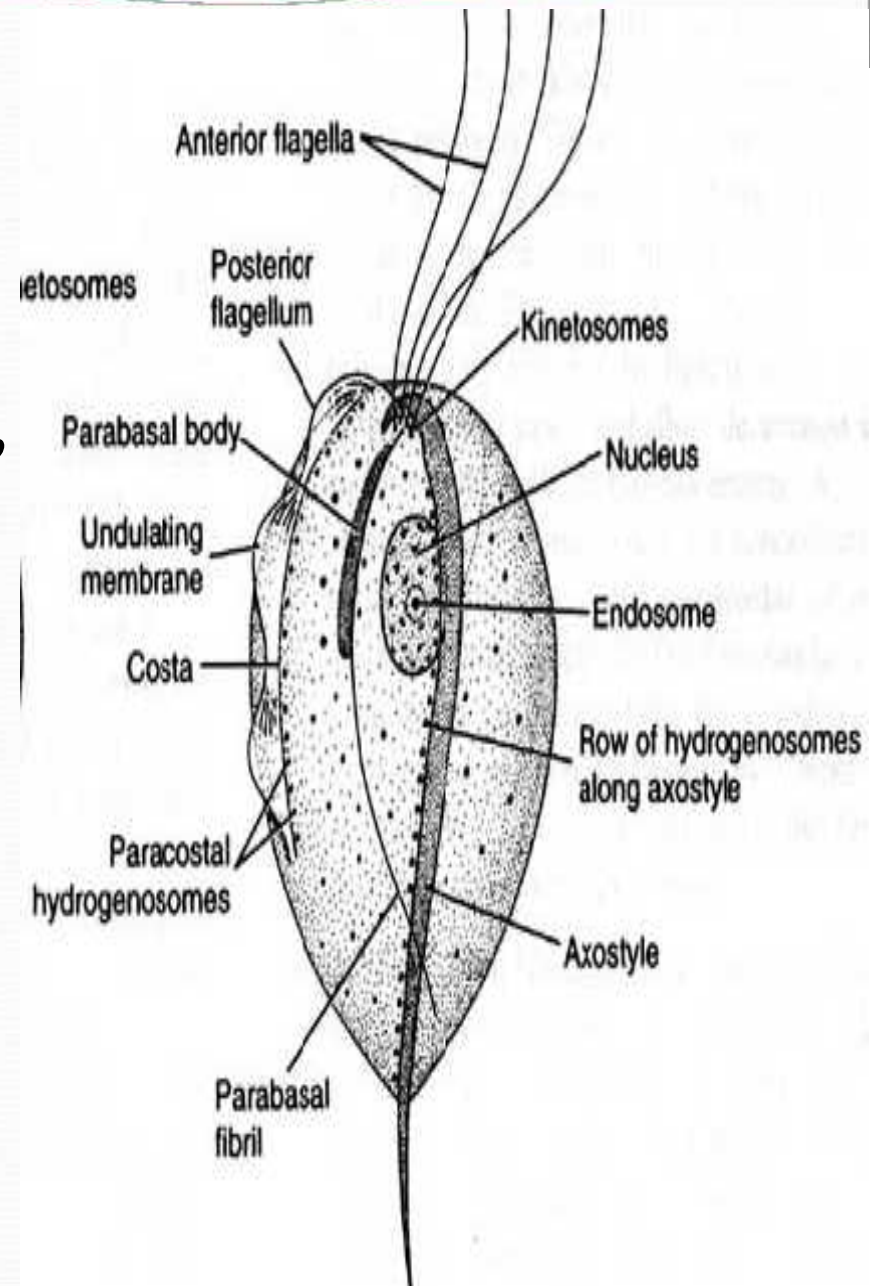


Life Cycle of *Giardia* inside human body



Trichomonas vaginalis

- Important features:
- A sexually transmitted disease (STD),
- *Trichomonas vaginalis* exists in **only one morphological stage, a trophozoite.**
- It is a **pear-shaped organism with a central nucleus**
- **Four** anterior flagella; and undulating membrane extends about two-thirds of its length



Human Trichomonads:

- 3 species of trichomonads found in human.
- Two are normally harmless.
- Trichomonas hominis which inhabit large intestine & non pathogenic.
- Trichomonas tenax which inhabit oral cavity & commensals.
- Trichomonas vaginalis is the Urogenital pathogenic flagellate which is a serious sexually transmitted pathogen.

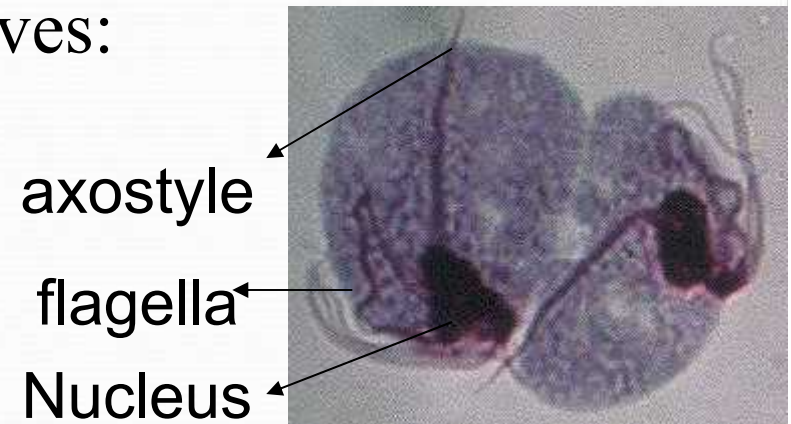
Urogenital flagellate: *Trichomonas vaginalis*

Causes : Trichomoniasis

Geographical Distribution : worldwide

Habitat: *T. vaginalis* trophozoite lives:

- In the vagina and urethra of infected females.
- In the urethra and Prostate of infected males
- (Never becomes cyst)





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