Parasitology: Protozoans

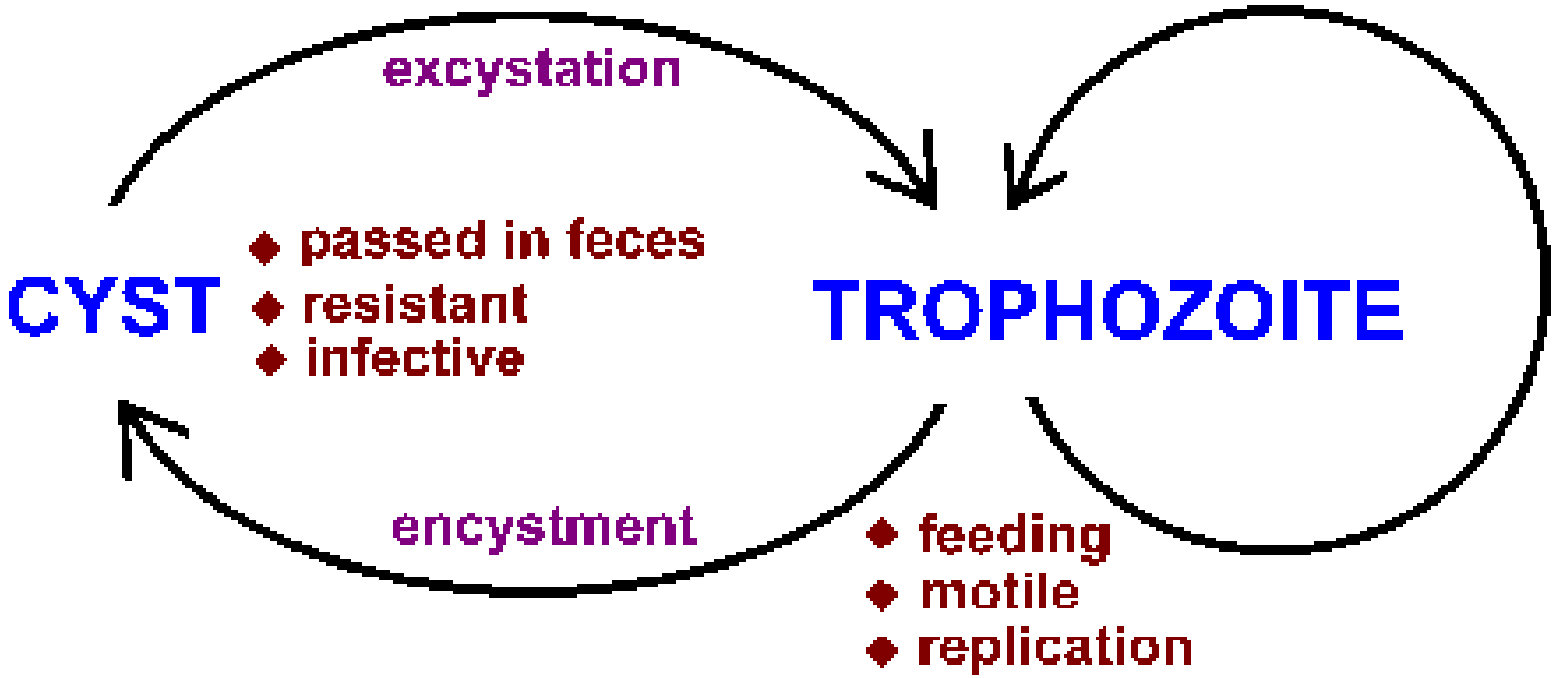
THE AMEBAS

Janice V. Ng, MSc
Department of Biology,
CAS, UP Manila

Phylum Sarcomastigophora
Subphylum Sarcodina

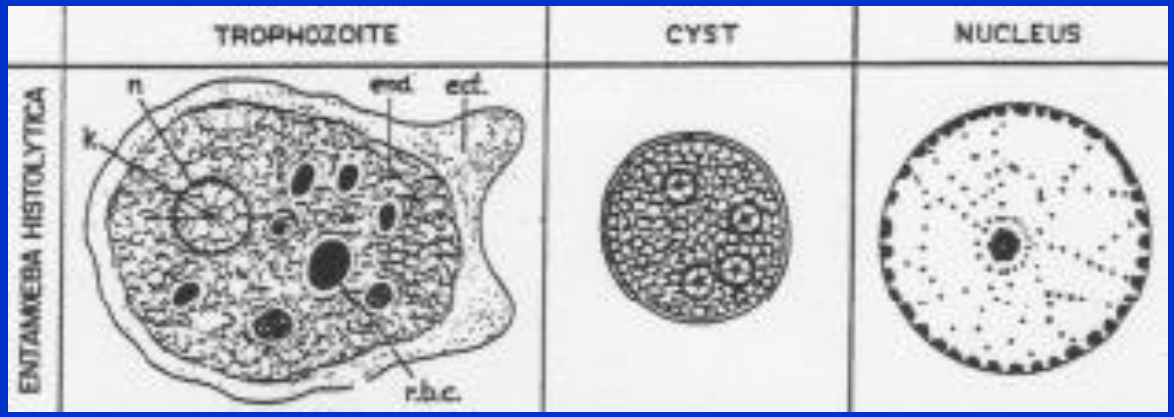
- *Entamoeba histolytica*
- *Entamoeba coli*
- *Entamoeba gingivalis*
- *Endolimax nana*
- *Iodamoeba butschlii*
- *Dientamoeba fragilis*
- *Naegleria spp.*
- *Acanthamoeba spp.*

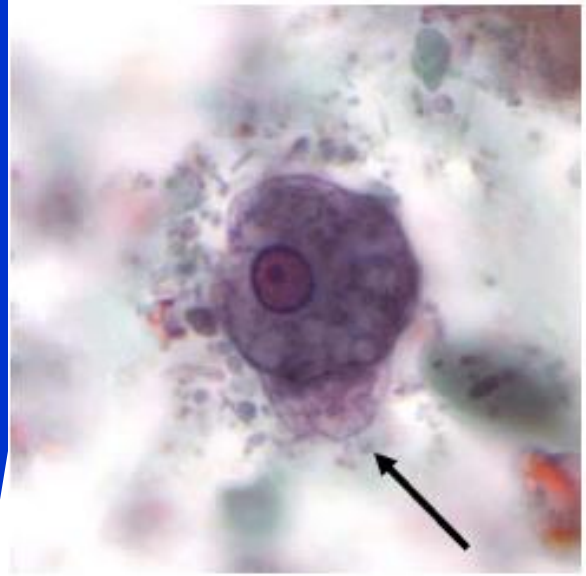
Typical Fecal-Oral Life Cycle



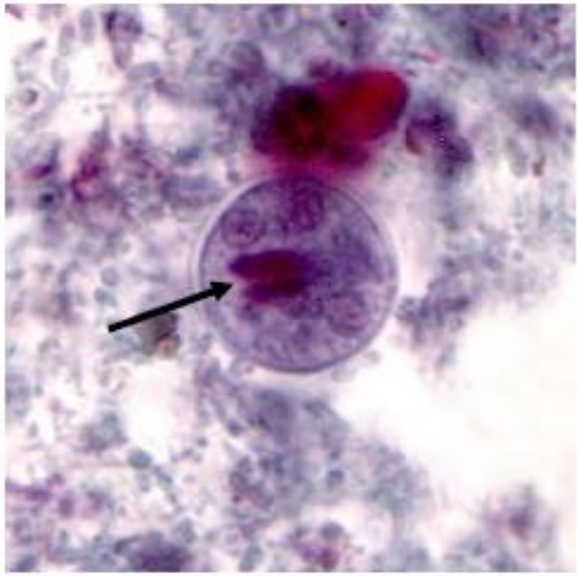
Entamoeba histolytica

- Pathogen causing amebiasis, amebic dysentery, amebic hepatitis
- Morphologically identical with *Entamoeba dispar*, but genetically distinct
- Trophozoite 15-30µm
- Cyst: 10-20µm

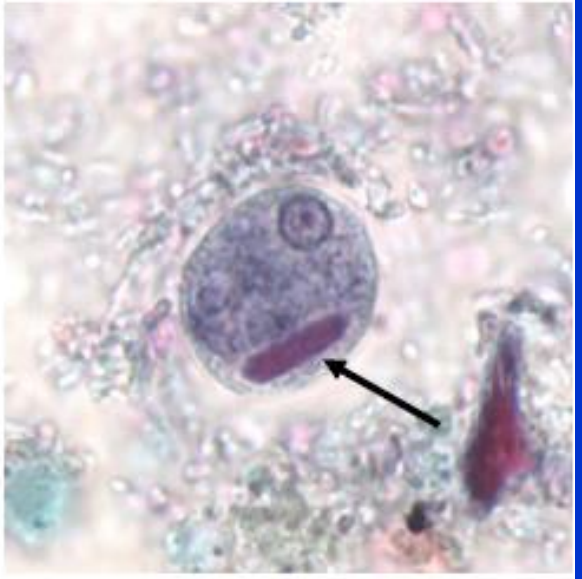




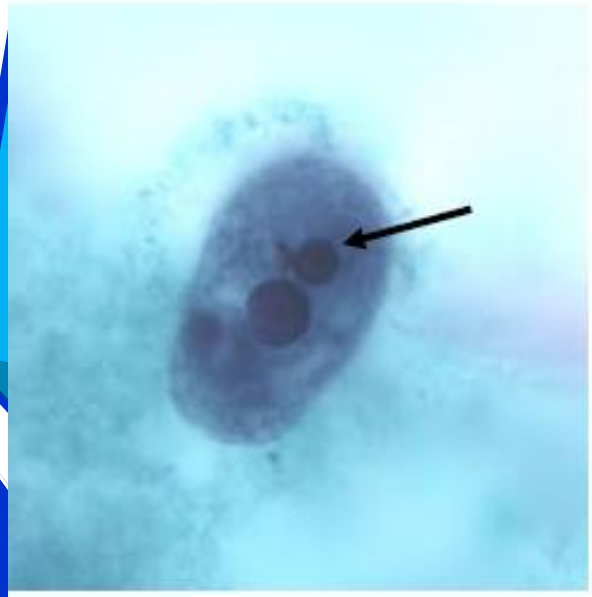
E. histolytica/E. dispar trophozoite with a progressive pseudopod (arrow).



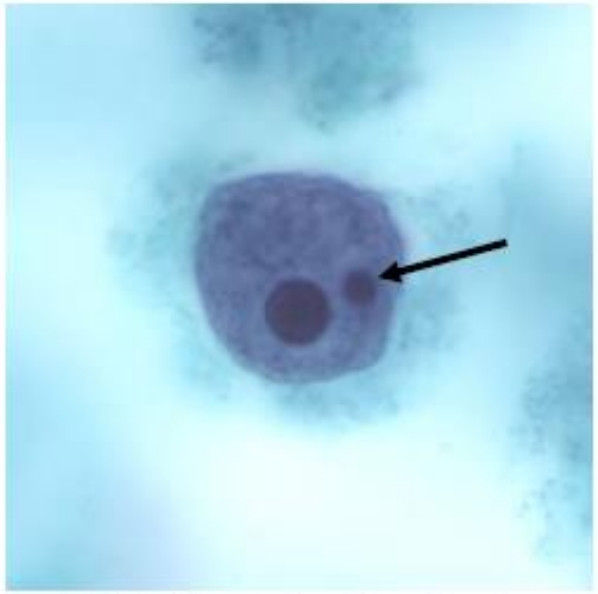
E. histolytica/E. dispar cyst showing chromatoid bodies with bluntly rounded ends (arrow).



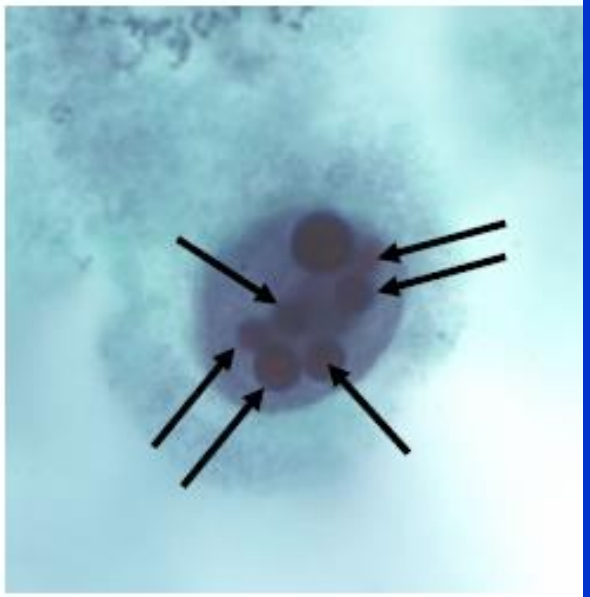
E. histolytica/E. dispar cyst showing a chromatoid body with bluntly rounded ends (arrow).



E. histolytica trophozoite with an ingested RBC (arrow).

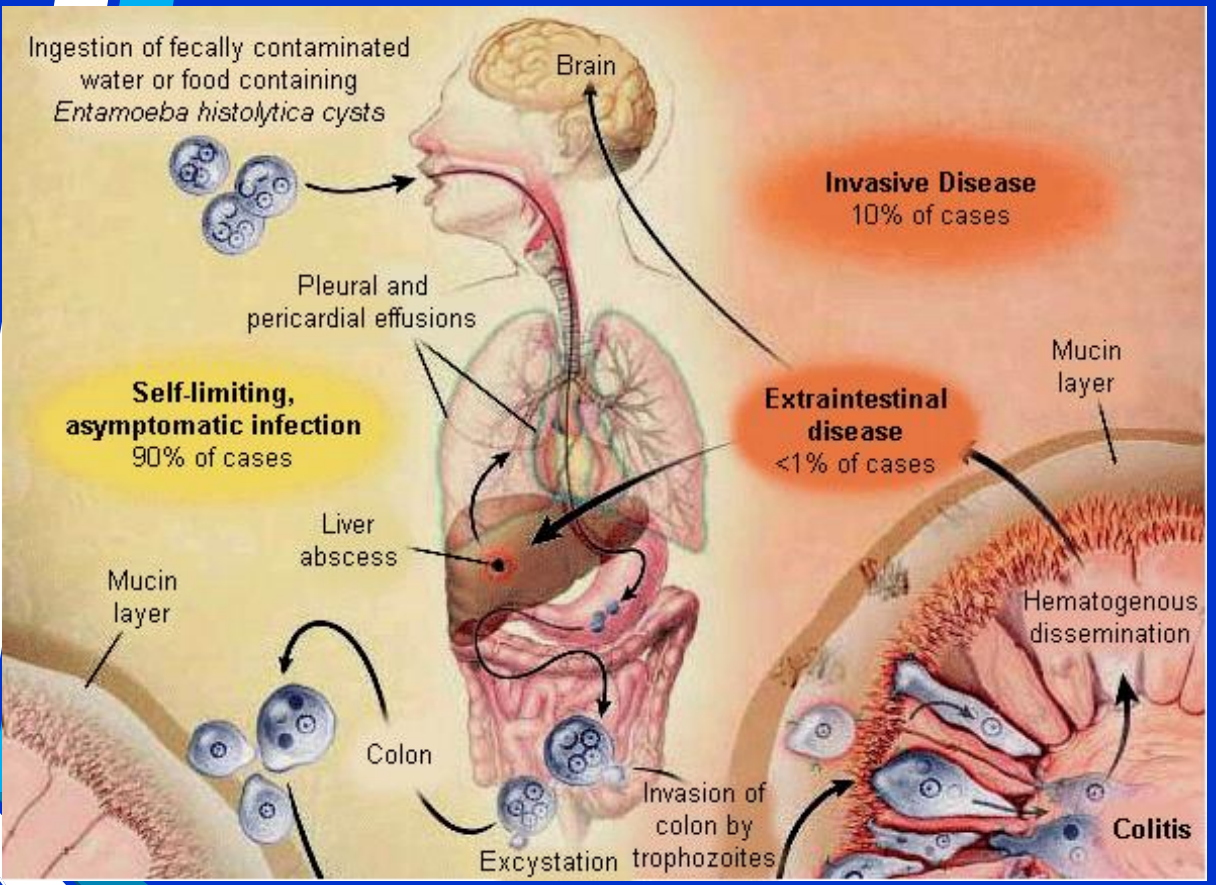


E. histolytica trophozoite with an ingested RBC (arrow).



E. histolytica trophozoite with six ingested RBCs in the focal plane (arrows).

Entamoeba histolytica



*Extra-intestinal route

Life Cycle

A. Small intestine

- Cyst → amebula or metacystic trophozoite

B1. Large intestine multiplication phase and pathology

- Amebula → trophozoite

B2. Large intestine/ colon – preparation for encystment

- Trophozoite → precyst → cyst (reproductive)

D. Infectivity outside the body of host

- Immature → mature cyst

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- Pathology, Symptomatology
  - Lesions - 1° intestinal and 2° extraintestinal

- Intestinal lesions: at large intestine, frequently at cecal and sigmoidorectal region
  - formation of flask-like primary ulcers, and cause lytic necrosis
  - acute amebiasis – severe dysentery, stools containing blood, abdominal pain, fever
  - chronic amebiasis – recurrent attacks of dysentery

- Extraintestinal lesion – invasion of liver, lungs, skin, spleen, brain
  - amebic hepatitis or liver abscess (necrosis of walls of vessel, formation of colonies in liver, growth of colony causes cell death; enlargement of lesion →abscess), lung abscess, amebic cutis, spleen abscess, brain abscess

Entamoeba histolytica

Diagnosis

- Stool examination
- Concentration method
- PCR, ELISA
- Biopsy

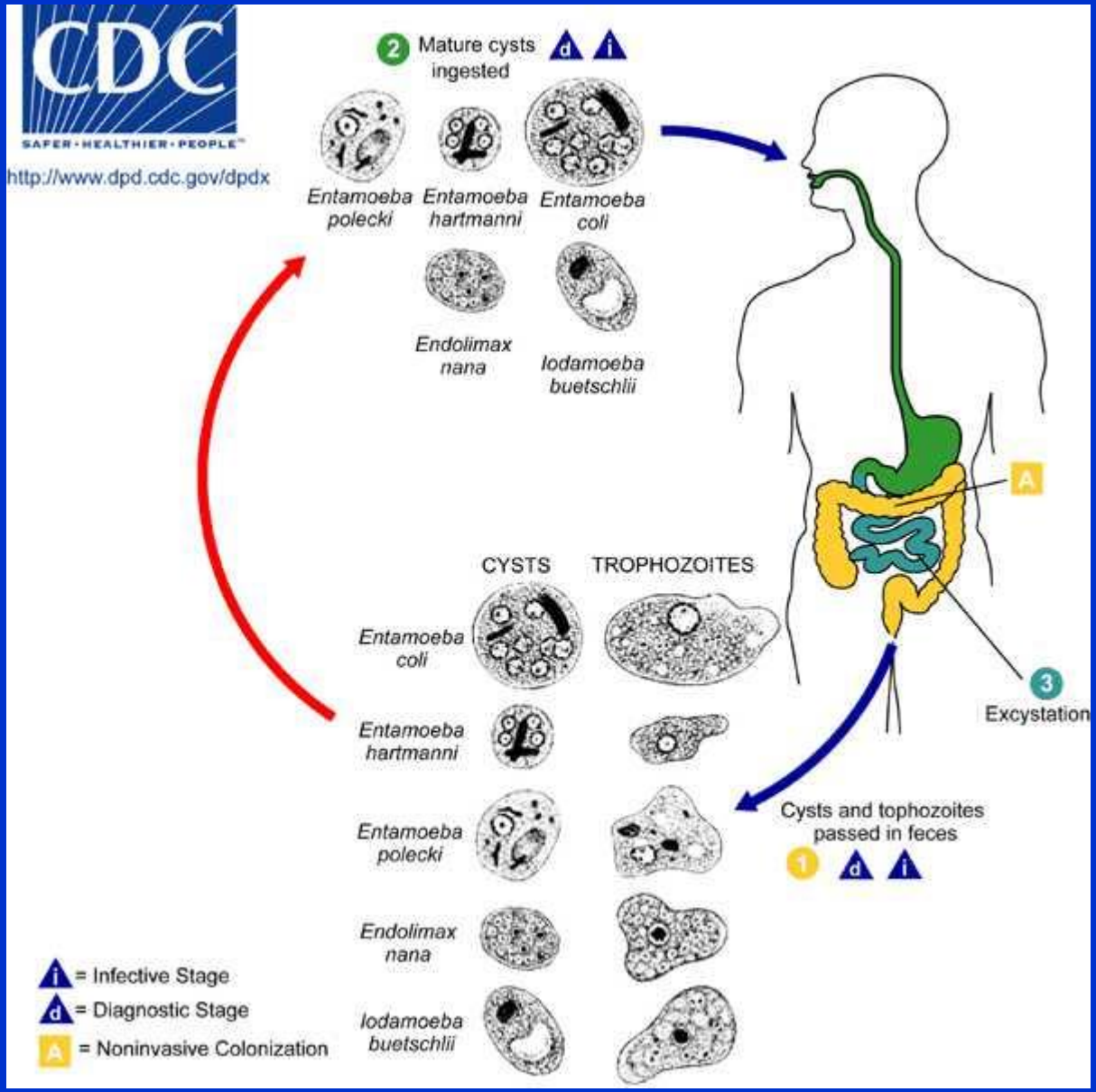
Prevention

- environmental sanitation to prevent water and food contamination
- boiling or filtration of drinking water
- avoid consumption of contaminated food

Treatment

- Metronidazole
- Diiodohydroxyquin

NON-PATHOGENIC INTESTINAL AMEBAE



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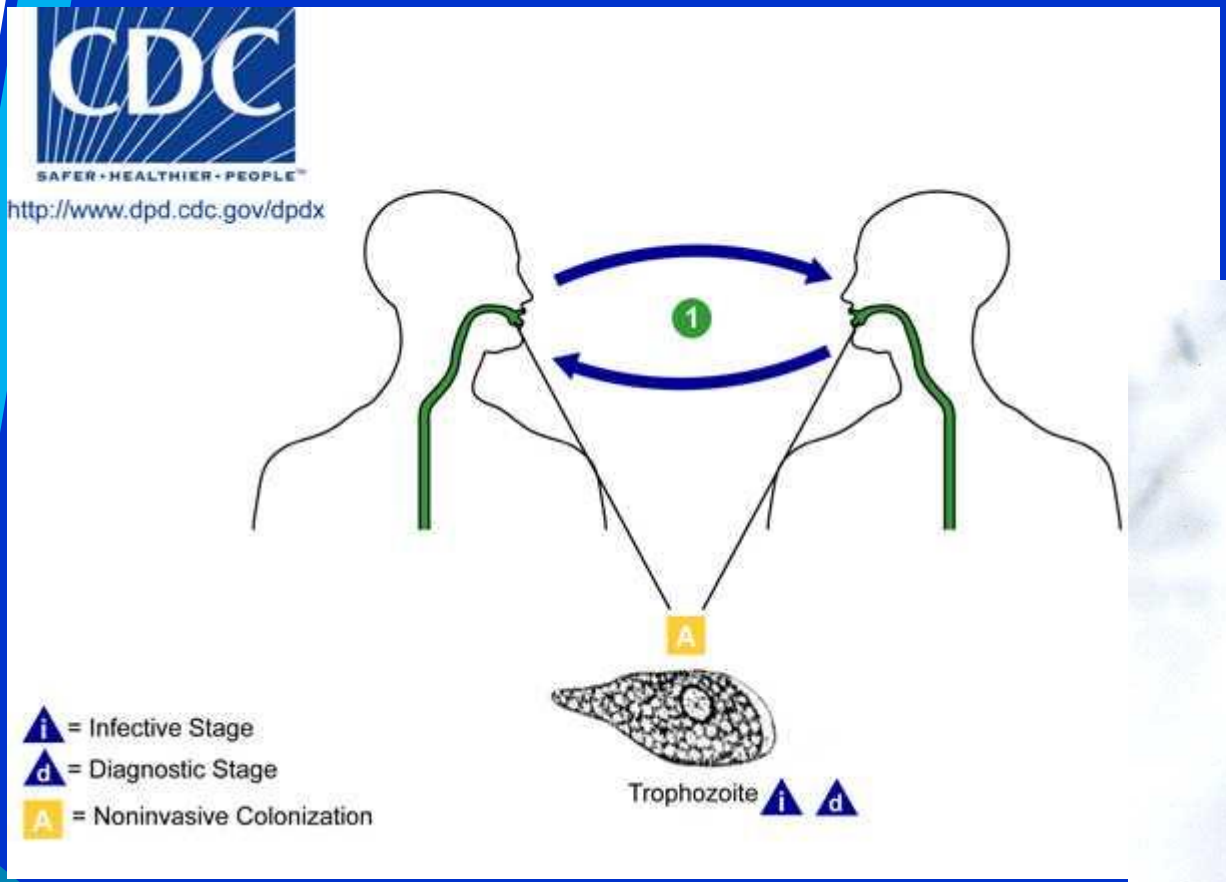
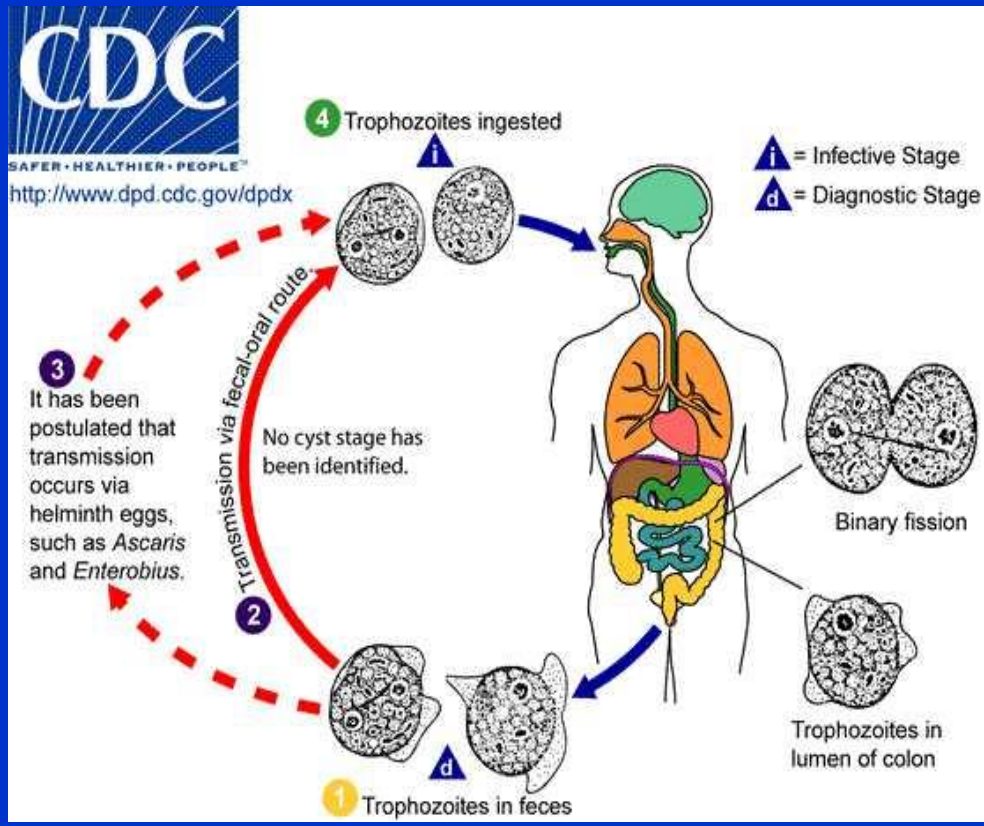
Entamoeba gingivalis



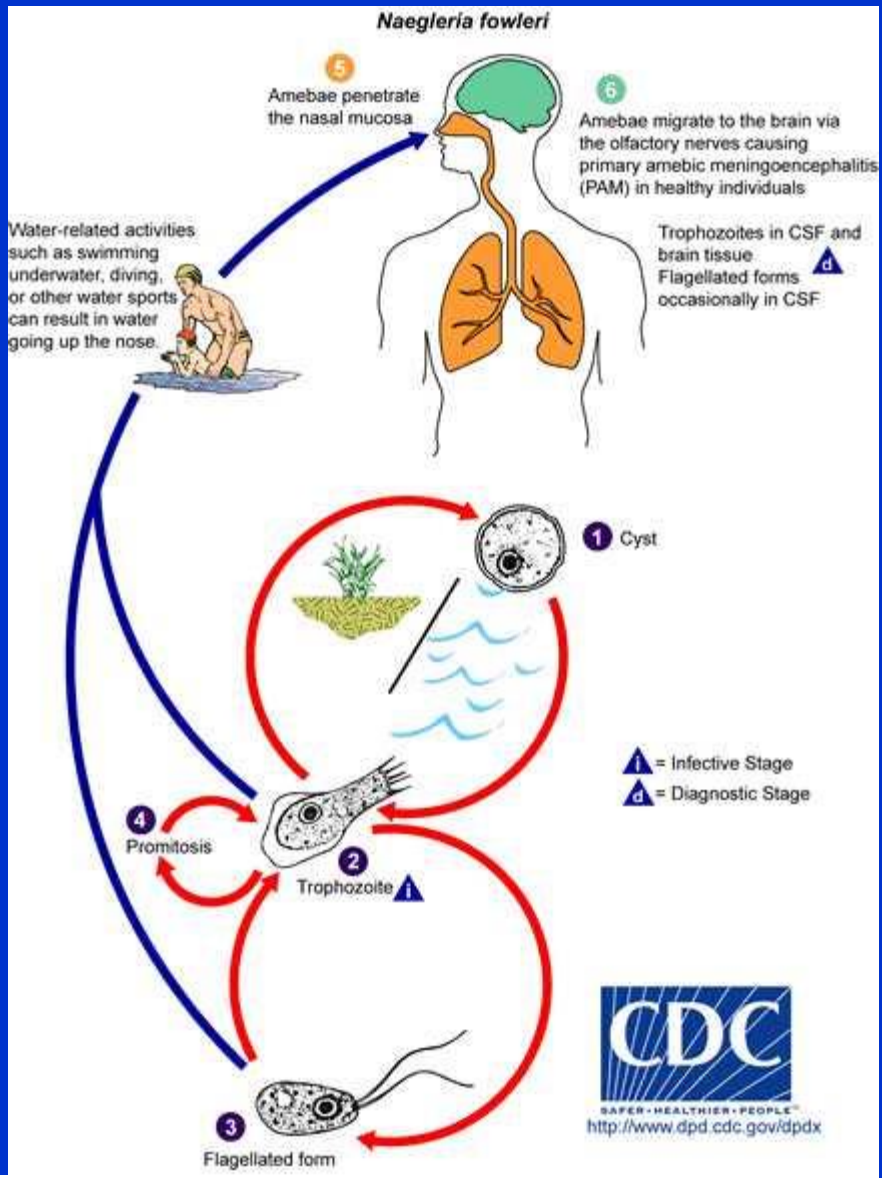
Dientamoeba fragilis

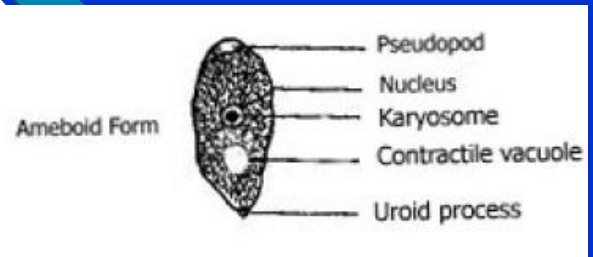
- Trophozoite stage only with eccentric endosome
- Amebo-flagellate
- Fecal-oral route of transmission
- Gastrointestinal tract of humans, pigs and gorillas

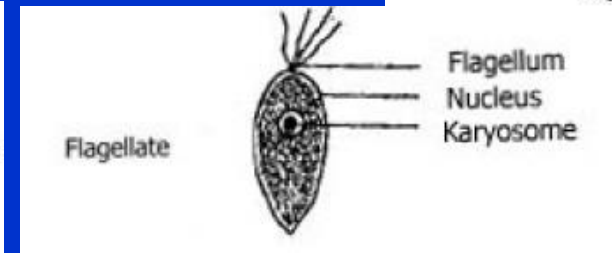


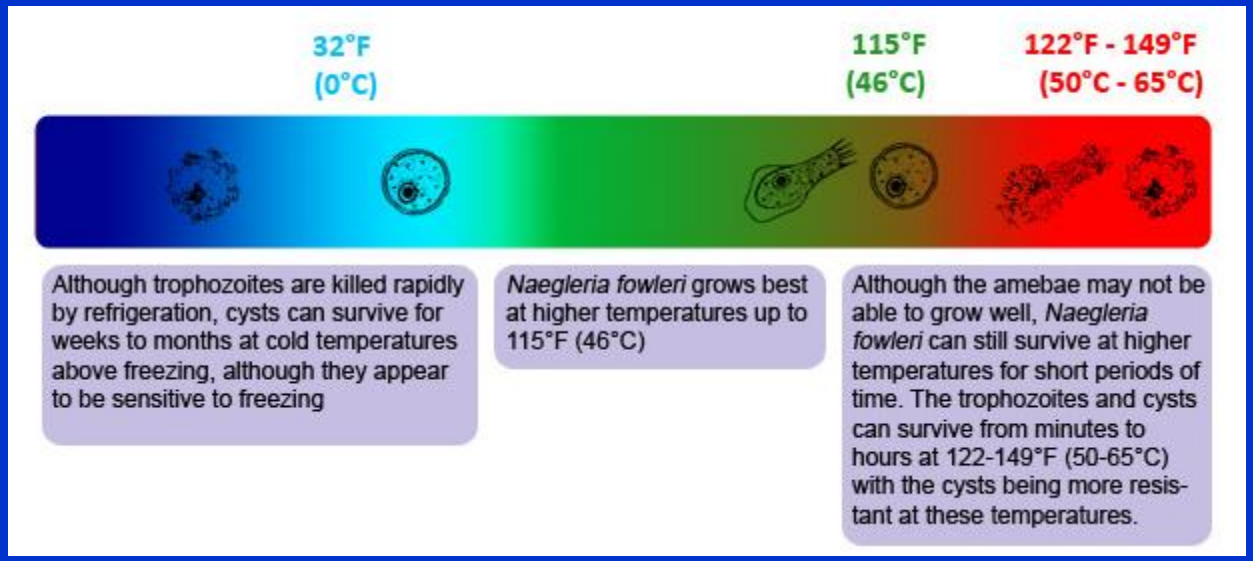
Naegleria fowleri/ aerobia

- Has three forms
- Undergoes transformation from amoeboid to flagellated form; amoeboid to cyst form
- Promitosis (nuclear membrane intact)
- Indigenous to warm freshwater and soils
- Exhibit tolerance in hot water
- Pathogenic causing primary amebic meningoencephalitis (PAM)



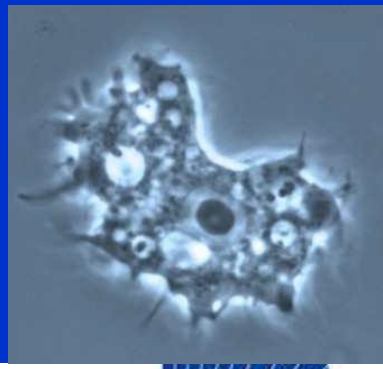




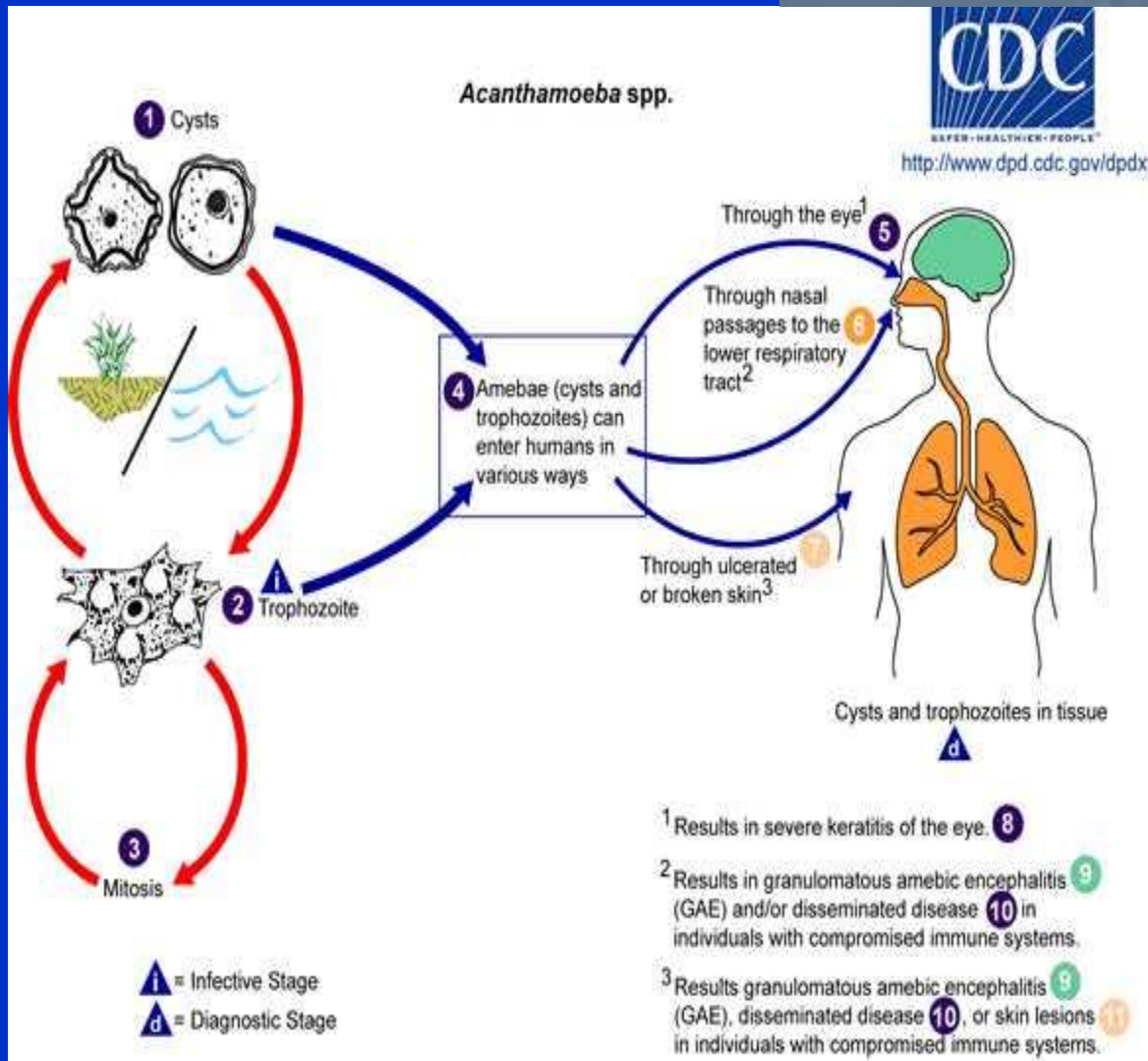


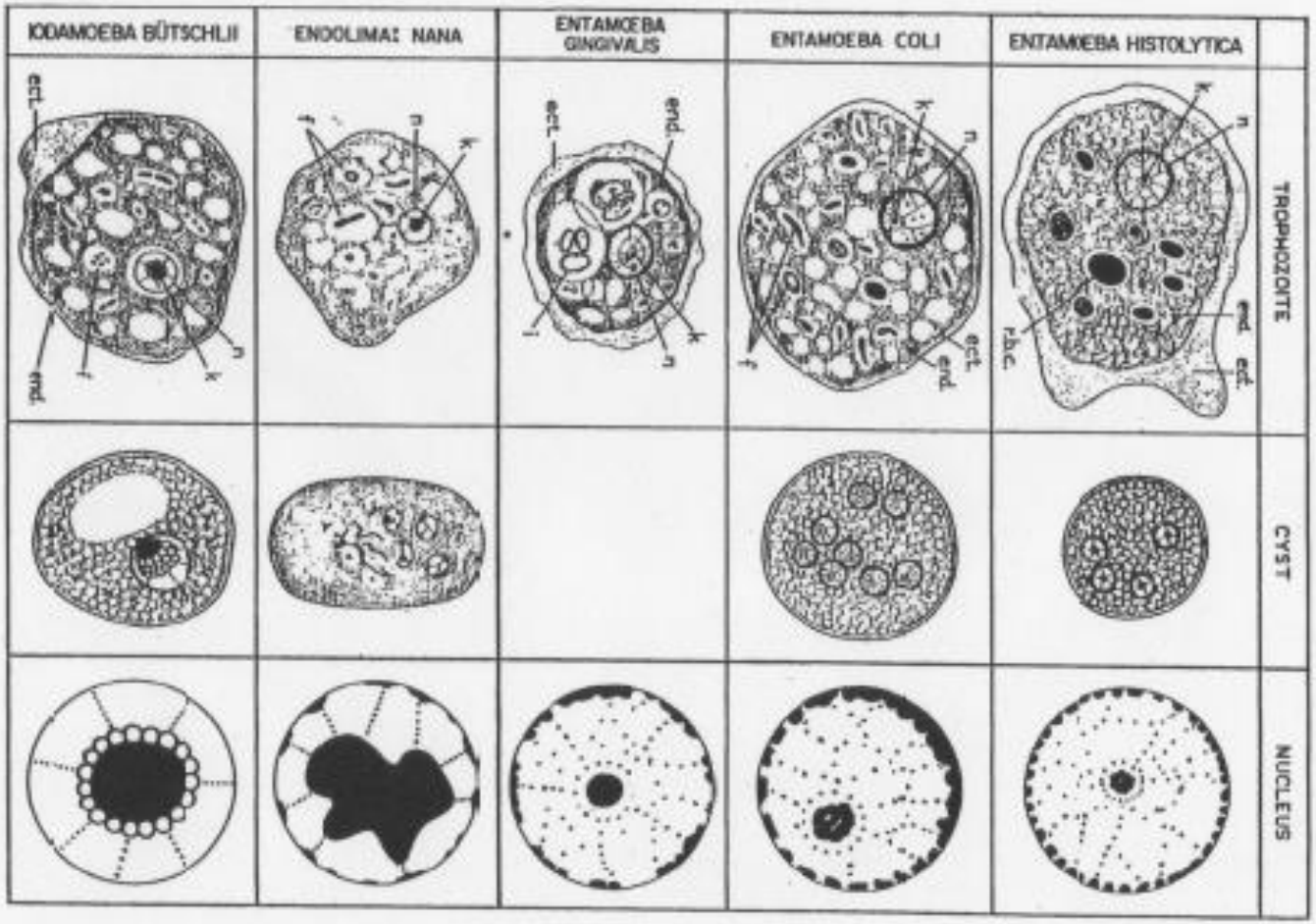
http://www.cdc.gov/parasites/naegleria/pathogen.html

Acanthamoeba spp



- Has free-living forms
- Trophozoite and cyst form
- Found in soil, salt water, freshwater, sewage, pools, contact lens eqpt., aircon, vegetables
- Pathogenic causing keratitis, granulomatous amoebic encephalitis





Comparative Morphology of the Amebas of Man and Schematic Representation of Their Nuclei. Ect., ectoplasm; end., endoplasm; f, food vacuoles; i, inclusion; k, karyosome; n, nucleus; r.b.c., red blood cells.

Taken from: Brown, H. W., and F. A. Neva. 1983. Basic Clinical Parasitology. 5th ed. Appleton-Century-Crofts, East Norwalk, Connecticut.