CRYPTOSPORIDIOSIS

Cryptosporidium parvum

- Enteric parasite
- One of the three most common diarrhea-causing pathogens in the world

Prevalence

- Found in most parts of the world
- Most prevalent in Asia, Africa, Australia, South America
- Antibody prevalence in Peru and Venezuela – 64%
- 32% in Peace Corps workers
- More prevalent in rural areas of U.S.
  - More animal contact

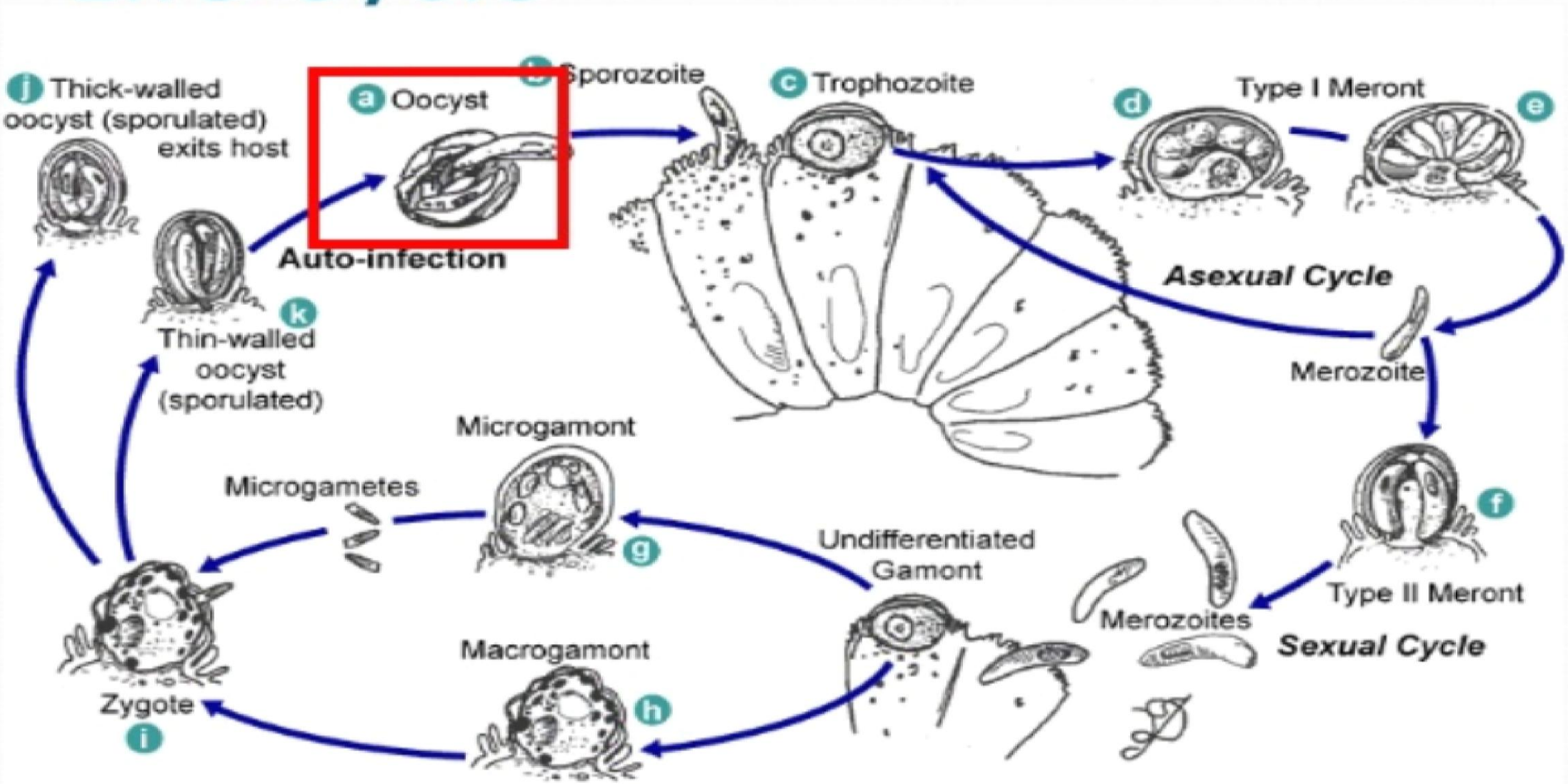
Transmission

- Fecal-oral route
- Fomites
- Water
  - Drinking water (even after treatment)
  - Swimming pools
- Unpasteurized Apple Cider
- Animal contact
- Food

Infectivity

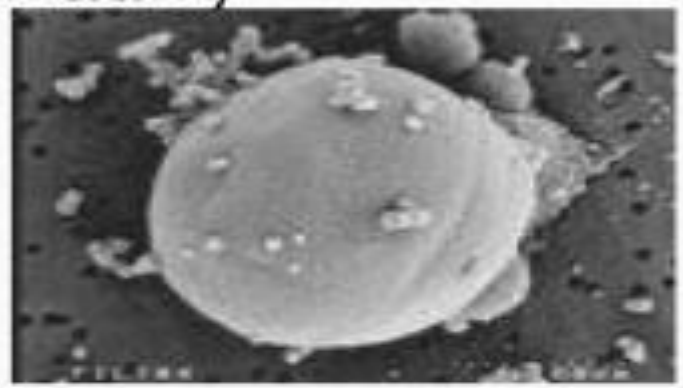
- *C. parvum* has a low ID_{50} (9-1000 oocysts)
- Can be infected by just one oocyst
- 10 billion oocysts per gram infected feces

Life Cycle


j Thick-walled oocyst (sporulated) exits host
a Oocyst
b Sporozoite
c Trophozoite
d Type I Meront
e
Auto-infection
k Thin-walled oocyst (sporulated)
Asexual Cycle
Merozoite
Microgamont
Microgametes
g
Undifferentiated Gamont
f
Type II Meront
Merozoites
Sexual Cycle
Macrogamont
h
Zygote
i

Oocyst

- Double walled
  - Resistant to chlorine, drying, progressive freezing, salt water
- Only stage in life cycle that can live ex vivo
- Imbeds itself in gut epithelium and releases sporozoites
- Reproduction continues sexually and asexually

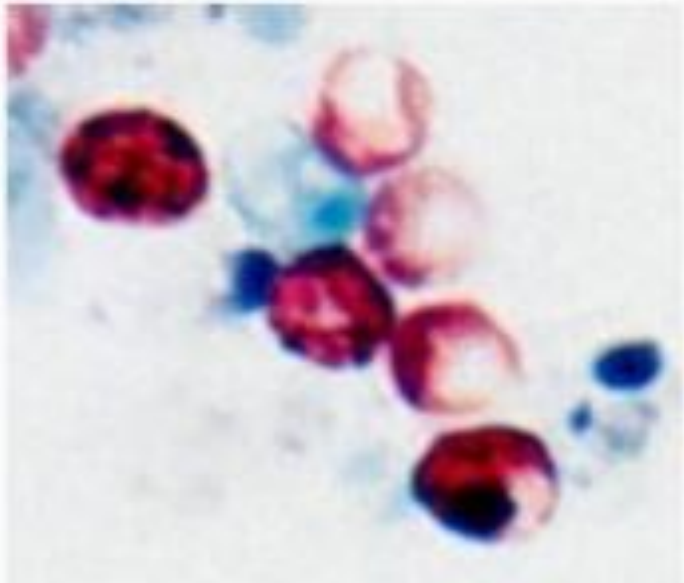


Clinical Characteristics

- Secretory diarrhea (some mucous, but no blood)
- Slight fever, fatigue, myalgia
- Oocysts may infect the lungs and trachea, resulting in cough
- Dehydration and extreme weight loss in immunocompromised

Detection

- Acid-fast stain of infected feces
- Direct immunofluorescence antibody stain using monoclonal antibody to oocyst wall



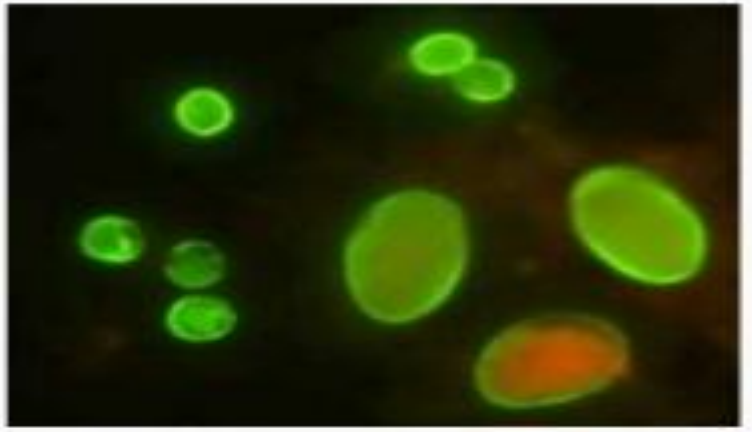
http://www.dpd.cdc.gov/

Treatment

- Nitazoxanide
  - Interferes with folate production
  - Prevents parasite replication
- Immunocompetent
  - *C. parvum* will usually pass on its own
- Immunocompromised
  - AIDS patients: treat with antiretrovirals and strengthen immune system, no cure
  - Others: would not benefit from antiretrovirals; keep hydrated

Prevention

- Water filtration
  - Filters must be <1 um to filter oocyst
- Swimming pools
  - Must be drained if infected fecal accident
- Pasteurization
- Hand washing
  - Particularly in daycares



C. Parvum (left) and *Giardia intestinalis* (right)