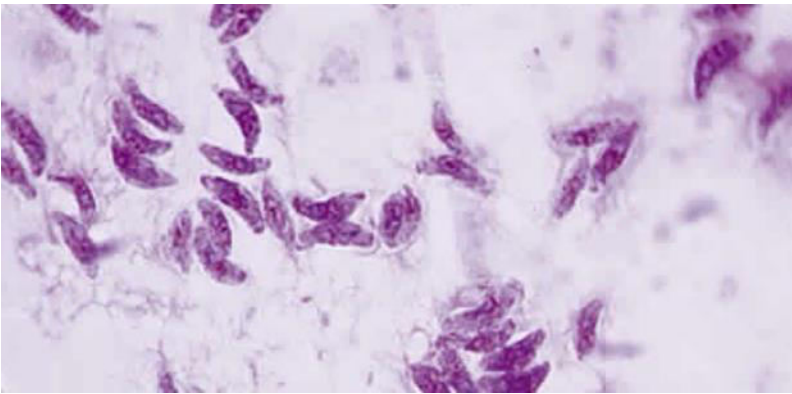


# Parasite

## *(Acanthamoeba & Toxoplasma)*



# Amoebae

- Protozoa with no truly defined shape.
- Move and acquire food through the use of pseudopodia.
- Found in water sources throughout the world.
- Few cause disease.

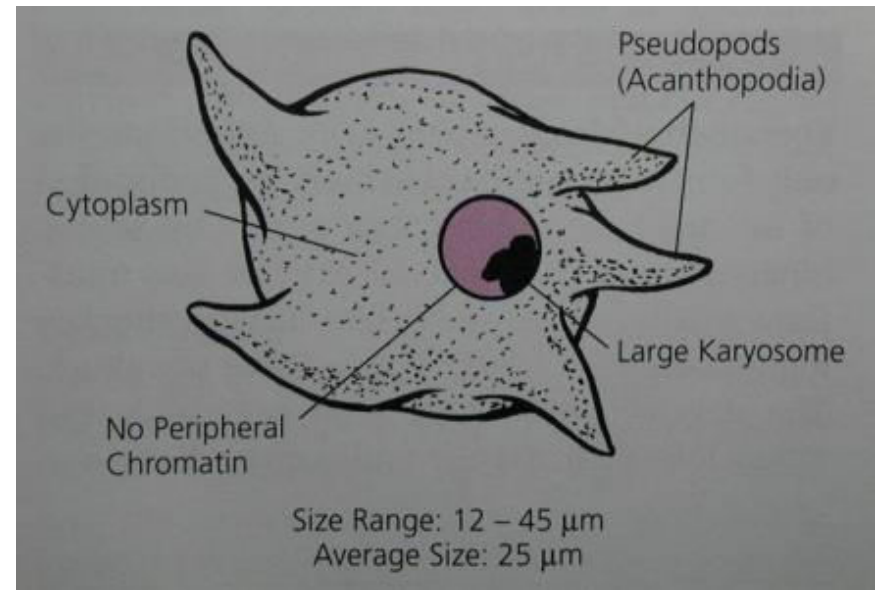
# *Acanthamoeba*

- ✓ Small protozan.
- ✓ Free-living trophozoites and cysts.
- ✓ Amoeba commonly found in water sources, such as tap water, well water, hot tubs, and soil and sewage systems.
- ✓ Cysts are common and are very resistant to chlorine.
- ✓ Infections with these amoebae are more common in immunocompromised patients

# *Acanthamoeba*

## Trophozoite morphology:

- It has a characteristic spike like pseudopodia (acanthopodia).
- It has one nucleus with large karyosome

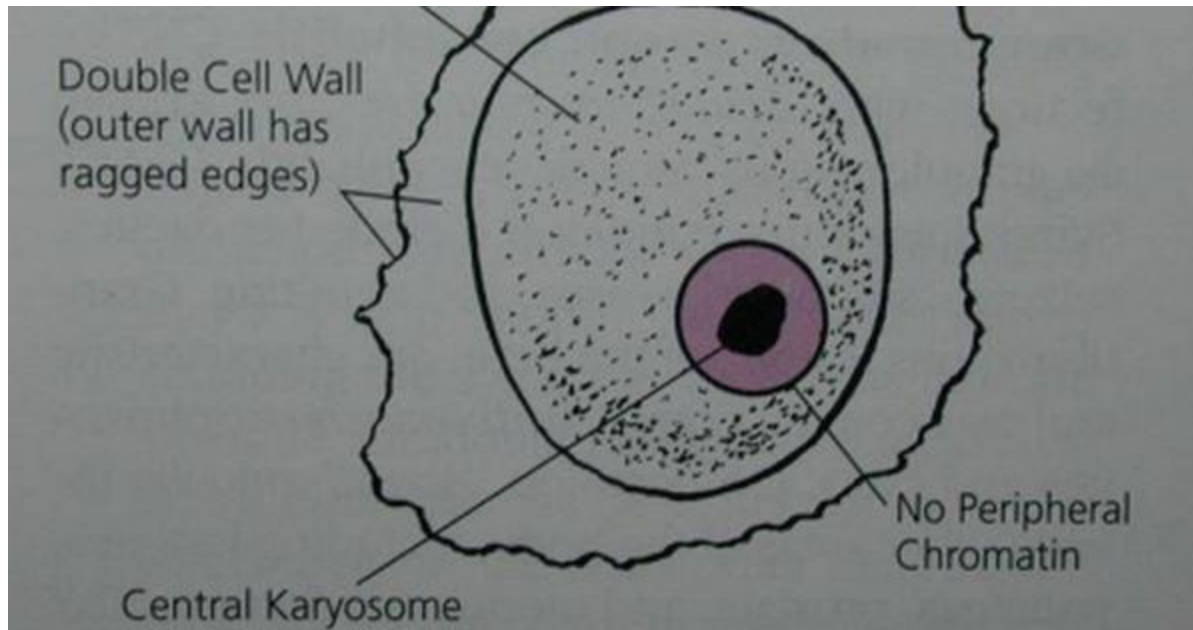




# *Acanthamoeba*

## Cyst morphology:

- Rounded shape with double cell wall
- It has one nucleus with large karyosome





# Pathogenesis of *Acanthamoeba*

*Acanthamoeba* genus causes 3 clinical syndromes:

- 1 - Granulomatous amebic encephalitis (GAE). (Alter mental status, headache ,fever, neck stiffness, seizures, focal neurological signs and coma leading to death)
- 2 - Disseminated granulomatous amebic disease
- 3 - Amebic keratitis: Most cases occur in people who wear contact lenses



# Laboratory Diagnosis

**Infective stage and diagnostic stage:** either the trophozoite or the cyst.

- The request is always STAT.
- Specimens: corneal scrapings or a biopsy sample (should never be refrigerated, to preserve the trophozoites).
  1. Wet mount (direct microscope examination)
  2. Stains with **Giemsa** or **Wright's stain**
  3. Histopathologic examination
- *Acanthamoeba* trophozoites or cysts can be demonstrated by previous methods.
- Granulomatous amebic encephalitis: \_ This condition is diagnosed via brain biopsy. (cyst and trophozoite)

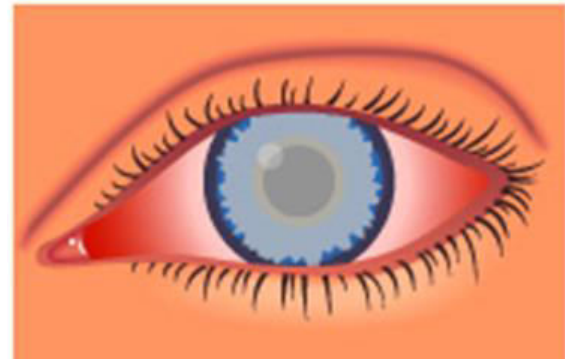
# Protozoal Keratitis

- It is uncommon corneal infection.
- **Etiology:** *Acanthamoeba spp.*
- It is often associated with:
  - ✓ Contact lens use.
  - ✓ Corneal trauma.
  - ✓ A history of exposure to possibly contaminated fresh water

## Characterized by:

- ✓ Sever pain
- ✓ Photophobia
- ✓ Blurred vision
- ✓ Redness in the white of the eye.

- ✓ The organism can adhere to the contact lens surface or may be present in non-sterile contact lens solution.
- ✓ Can enter through trauma.
- ✓ Swimming while wearing lenses.



# Treatment and Control of Protozoal Keratitis

## Treatment:

- Oral itraconazole + topical miconazole
- Corneal transplant

## Control:

- Do not wear contact lenses while swimming.
- Take good care of lenses.
- Do not use home-made saline for cleaning lenses
- Avoidance of swimming in contaminated water
- Proper chlorination of water

# *Toxoplasma gondii*

- Toxoplasma gondii is a microscopic parasite that caused Toxoplasmosis infection.
- It is protozoan that distributed worldwide and infects all vertebrate species.
- It is obligate, intracellular parasites that live inside the cells of humans and animals (cats and farm animals).
- This protozoa can have complex life cycle usually in more than one

# *Toxoplasma gondii*

*Toxoplasma gondii* exist in 3 forms:

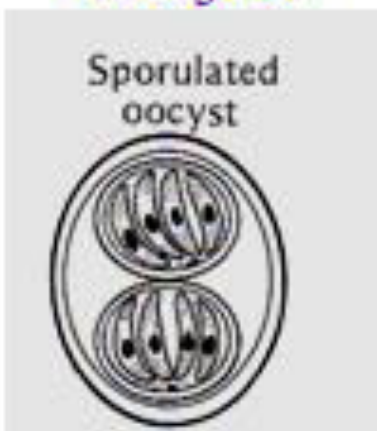
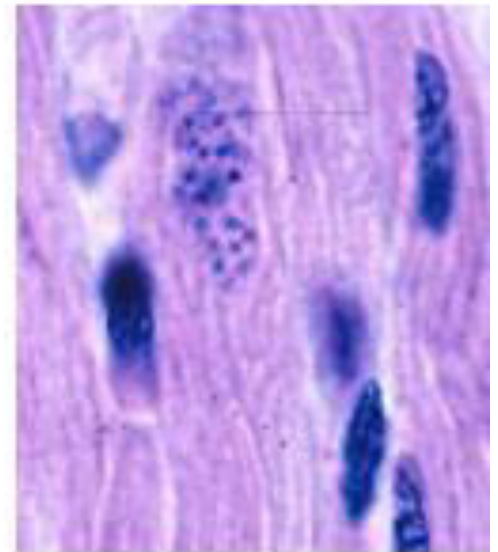
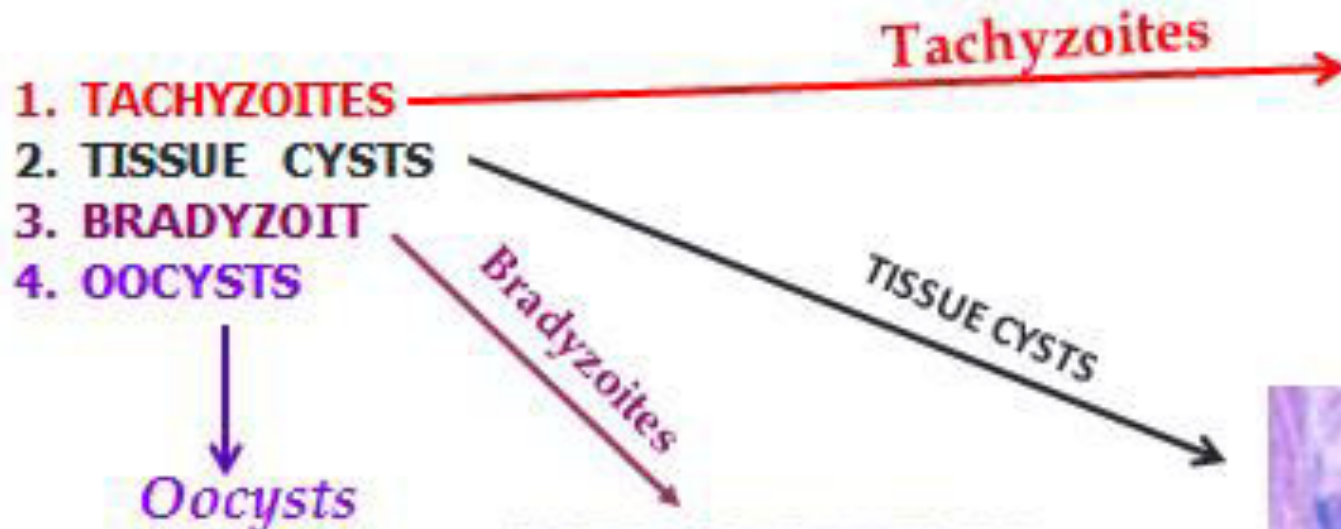
- **Trophozoites**

There are 2 kinds of trophozoites found in human infections:

- **Tachyzoites** → rapidly growing , and seen in body fluids in early acute infections. (in blood)
- **Bradyzoites (Tissue cyst)** → slowly growing and are contained in cysts in muscle and brain tissue and in the eye. (when tissue cysts ruptured it will cause local inflammation with blockage of blood vessels and necrosis).

- **Oocyst**

*Toxoplasma gondii* exists in three forms  
All parasite stages are infectious.



# *Toxoplasma gondii*

## Reproduction:

✓ Sexually reproduction (Definitive host) →

In Cats, where Oocysts are released in feces of cat.

✓ Asexual reproduction (intermediate host) →

In worm blooded animals (cats, mice, humans, and birds).

# Pathology & Clinical Significance

- In immunologically normal human: infection may be asymptomatic, cause lymphadenopathy, or affect almost any organ.
- In immunocompromised individuals: often causes signs or symptoms related to the central nervous system (CNS)
- Congenital infection: if untreated, often causes disease either prenatally or later in life. This form can be severe, resulting in stillbirths, or brain lesions. And also it's a major cause of blindness in newborns.



# Transmission of *Toxoplasma gondii*

All parasitic stage are infectious.

Humans can become infected by:

- 1 Accidental ingestion of oocysts present in cat feces.
- 2 Eating raw or undercooked meat.
- 3 Congenitally from infected mother to fetus (Babies that get infected during the first trimester show to have the most severe symptoms)
- 4 Rarely by blood transfusion
- 5 Rarely by organ transplant

# Congenital Toxoplasmosis

## ➤ Mild signs:

- ✓ premature birth.
- ✓ small size for gestational age.
- ✓ retinal scars.
- ✓ persistent jaundice.
- ✓ mild thrombocytopenia.

## ➤ More severe signs:

- ✓ Psychomotor retardation and resulting low IQ
- ✓ Seizures / Blindness, sometimes deafness

## ➤ Severe disease and death

# Ocular Toxoplasmosis

## ➤ Congenital Ocular Toxoplasmosis:

- This is the most common type of ocular toxoplasmosis.
- It is due to maternal infection while pregnant.
- Depending on the trimester of pregnancy, multiple systemic effects can be seen.
- Often is seen as bilateral retinal scars involving central vision.

## ➤ Acquired Ocular Toxoplasmosis:

- Many toxoplasmosis infections are asymptomatic and rarely result in visual problems (estimated at 3%).
- Often is seen on a routine eye exam as a retinal scar in one eye

# How to Care for Your Contact Lenses

1. Remember to also clean and sterilize your lens cases, to avoid Acanthamoeba contamination.
2. Follow your eye doctor's recommendations regarding care of your contact lenses. Use only products that he or she recommends.
3. Never use tap water with your contact lenses. The FDA has recommended that contact lenses should not be exposed to water of any kind.
4. Do not swim, shower or use a hot tub while wearing contacts. If you do decide to wear your lenses while swimming, wear airtight swim goggles over them. (Read about additional strategies for swimming with contact lenses.)
5. Be sure to soak your lenses in fresh disinfecting solution every night. Don't use a wetting solution or saline solution that isn't intended for disinfection.
6. Always wash your hands before handling your lenses.
7. Unless you are wearing disposable contact lenses that are replaced daily, always clean your contacts immediately upon removal, rubbing the lenses under a stream of multipurpose solution — even if using a "no-rub" solution — and storing them in a clean case filled with fresh (not "topped off") multipurpose or disinfecting solution