COLLEGE OF PHARMACY
MEDICAL MICROBIOLOGY
SECOND STAGE


# Toxoplasma gondii
# Comprehensive Overview

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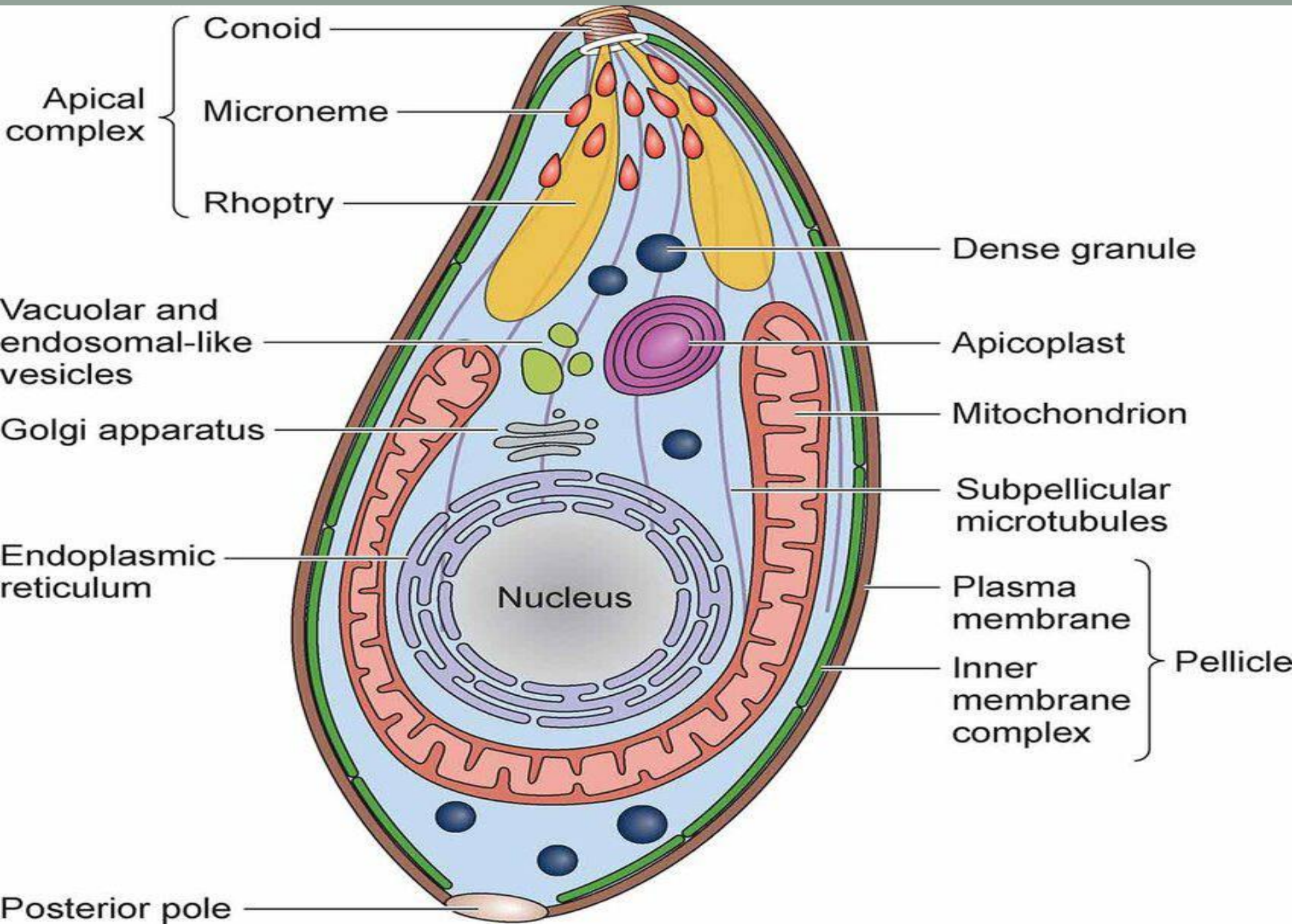
# Introduction

- - Toxoplasma gondii is an obligate intracellular protozoan parasite.
- - It is one of the most common parasites worldwide.
- - While often asymptomatic, it poses risks for immunocompromised individuals and pregnant women.
- - Infection is primarily transmitted through ingestion of contaminated food, water, or soil.

# Life Cycle

- 1. Definitive Host (Cats):
- - T. gondii undergoes sexual reproduction in the feline intestinal lining.
- - Oocysts are shed in cat feces and can survive in the environment for months.

- 2. Intermediate Hosts:
- - Humans, rodents, and birds ingest oocysts via contaminated food or water.
- - The parasite forms tissue cysts in muscles, brain, and organs.


Apical complex
Conoid
Microneme
Rhoptry
Dense granule
Vacuolar and endosomal-like vesicles
Apicoplast
Golgi apparatus
Mitochondrion
Subpellicular microtubules
Endoplasmic reticulum
Nucleus
Plasma membrane
Inner membrane complex
Pellicle
Posterior pole

# Modes of Transmission

- - Consuming undercooked or raw meat containing tissue cysts.
- - Ingesting water, soil, or vegetables contaminated with oocysts.
- - Handling cat litter or soil without proper hygiene.
- - Vertical transmission from mother to fetus during pregnancy.
- - Rarely, transmission through organ transplantation or blood transfusion.

# Clinical Manifestations

- 1. Asymptomatic:
- - Most infections in healthy individuals are subclinical.

- 2. Mild Illness:
- - Fever, muscle aches, swollen lymph nodes.

- 3. Severe Cases (Immunocompromised):
- - Encephalitis, seizures, confusion, blurred vision, and respiratory issues.

- 4. Congenital Toxoplasmosis:
- - Fetal abnormalities include hydrocephalus, intracranial calcifications, and retinochoroiditis.

# Diagnosis

- - Serology:
- - IgG and IgM antibodies to determine recent or past infections.
- - Molecular Testing:
- - PCR to detect T. gondii DNA in amniotic fluid or blood.
- - Imaging Studies:
- - CT or MRI for detecting brain lesions or calcifications.
- - Ophthalmologic Exam:
- - Identification of retinochoroiditis in congenital or ocular toxoplasmosis.

# Prevention

- - Food Safety:
- - Cook meat to internal temperatures of at least 63-74°C (145-165°F).
- - Wash fruits and vegetables thoroughly before consumption.

- - Hygiene:
- - Wash hands after handling raw meat, soil, or cat litter.
- - Pet Care:
- - Clean litter boxes daily, wear gloves, and avoid allowing cats to hunt.
- - Pregnancy Precautions:
- - Pregnant women should avoid handling litter or consume properly cooked meals.

# Treatment

- 1. Immunocompetent Individuals:
- - Usually self-limiting, may not require treatment.

- 2. Severe Cases or Immunocompromised:
- - Pyrimethamine + Sulfadiazine, supplemented with Folinic acid.

- 3. Pregnant Women:
- - Spiramycin to prevent vertical transmission.
- - Pyrimethamine and Sulfadiazine if fetal infection is confirmed.

# Potential Complications

- - Encephalitis and neurological damage in immunocompromised patients.
- - Blindness due to retinal damage (ocular toxoplasmosis).
- - Fetal developmental abnormalities in congenital toxoplasmosis.
- - Chronic infection with possible reactivation under immunosuppression.

- - Toxoplasma gondii is a significant global health concern.
- - Preventive measures play a crucial role in reducing transmission.
- - Early diagnosis and appropriate treatment improve outcomes, especially in high-risk groups.

# Thank you for listening