LAB-9-
PARASITOLOGY

Submitted by

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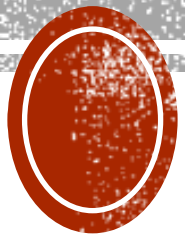


Toxoplasma gondii)toxoplasmosis(

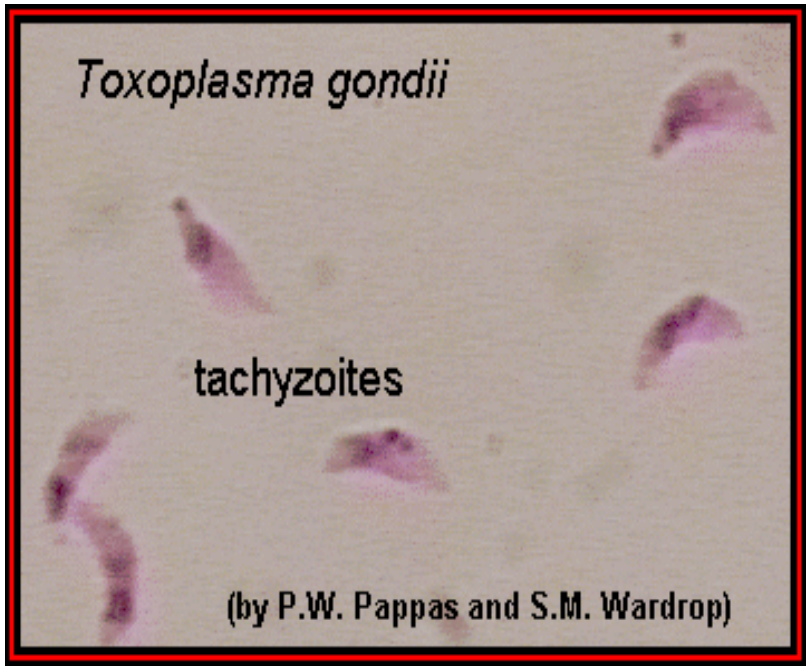
- *Toxoplasma gondii Toxoplasma* is an obligate intracellular parasite.
- Its life cycle includes two phases called the intestinal (or enteroepithelial) and extraintestinal phases.
- Felines are **definitive host**
- Wide range of birds and mammals including man are **intermediate host.**

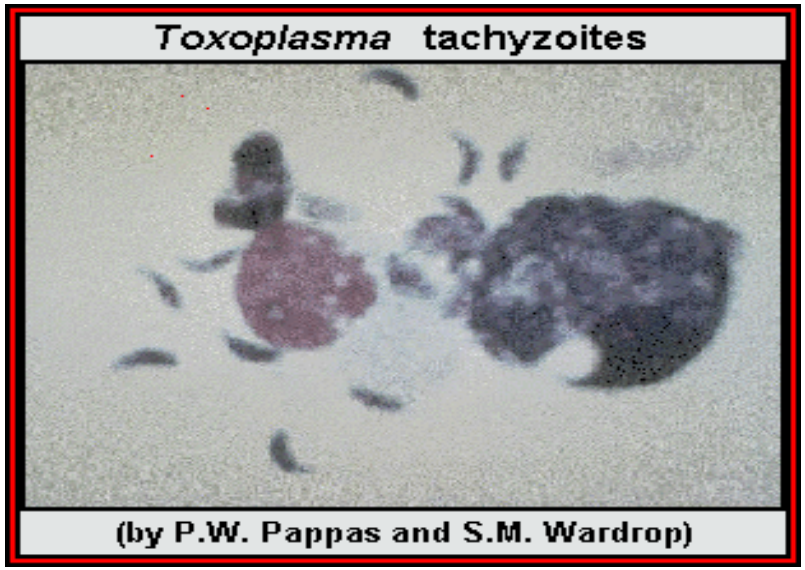
- The intestinal phase occurs in cats only (wild as well as domesticated cats) and produces "oocysts." The extraintestinal phase occurs in all infected animals (including cats) and produces "tachyzoites" and, eventually, "bradyzoites" or "zoitocysts." The disease toxoplasmosis can be transmitted by ingestion of oocysts (in cat feces) or bradyzoites (in raw or undercooked meat).

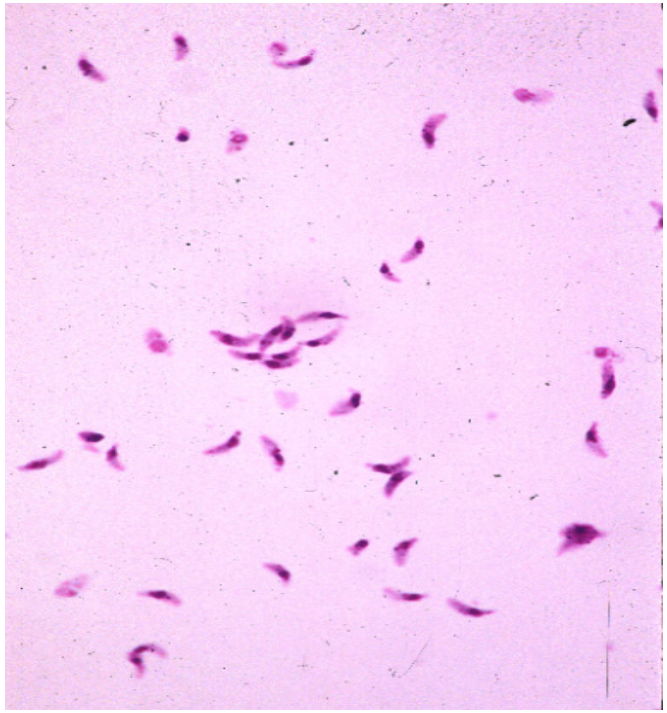
- In most humans infected with *Toxoplasma*, the disease is asymptomatic. However, under some conditions, toxoplasmosis can cause serious pathology, including hepatitis, pneumonia, blindness, and severe neurological disorders. This is especially true in individuals whose immune systems are compromised (e.g., AIDS patients). Toxoplasmosis can also be transmitted transplacentally resulting in a spontaneous abortion,or a child that is severely handicapped mentally and/or physically.

Morphology

- The intracellular parasites (tachyzoite) are 3x6µ, crescent shaped organisms that are enclosed in a parasite membrane to form a cyst measuring 10-100 µ in size. Cysts in cat feces (oocysts) are 10-13 µ in diameter







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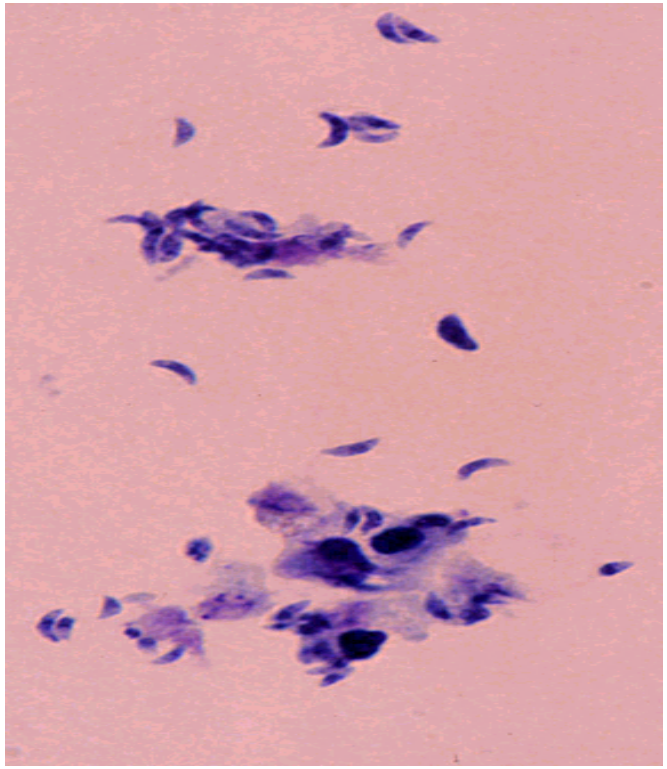
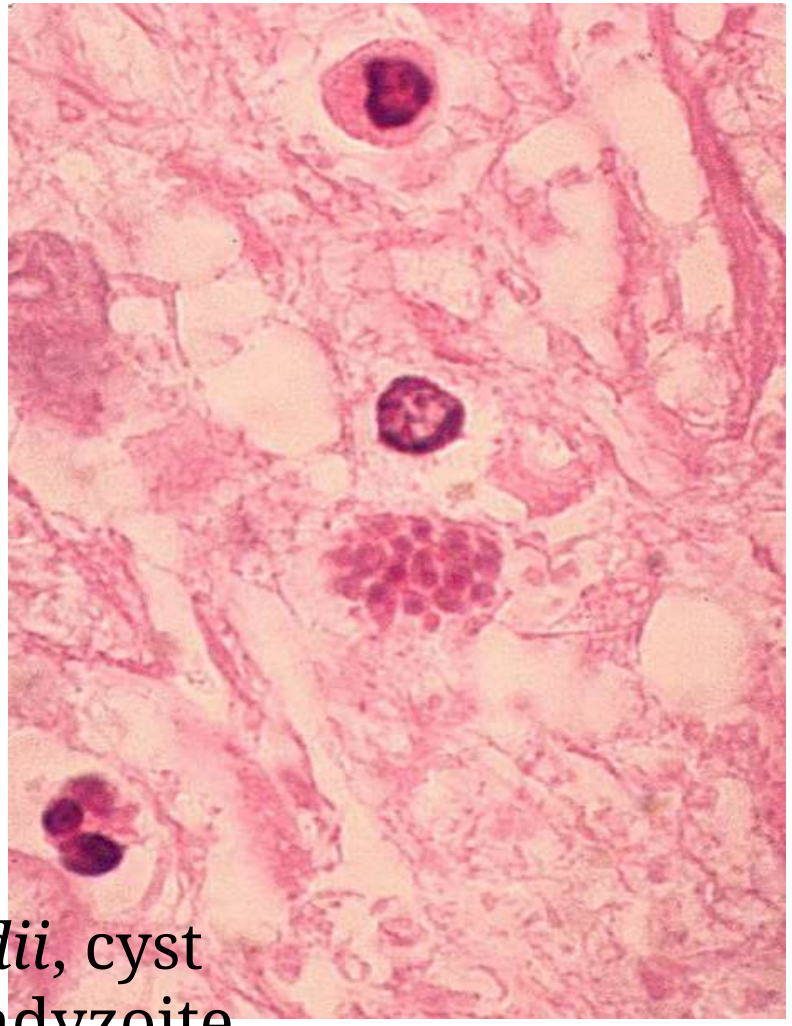


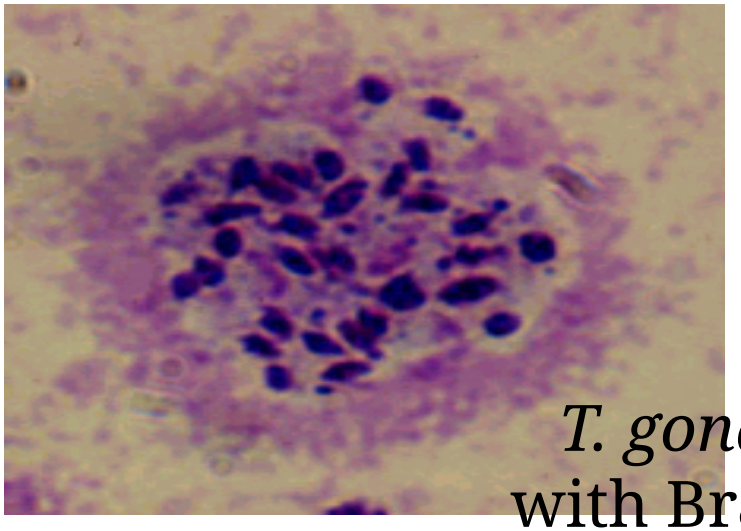
Methylene blue

Toxoplasma gondii Tachyzoite (2 – 3 X 4 – 7 µm) (X 1000)

Note : this crescent in shape we found it in (placenta, C.S.F., peritoneal fluids, ,amniotic fluid

)Spinal cord, lymph node fluid, blood, muscles, lung, liver, bone marrow

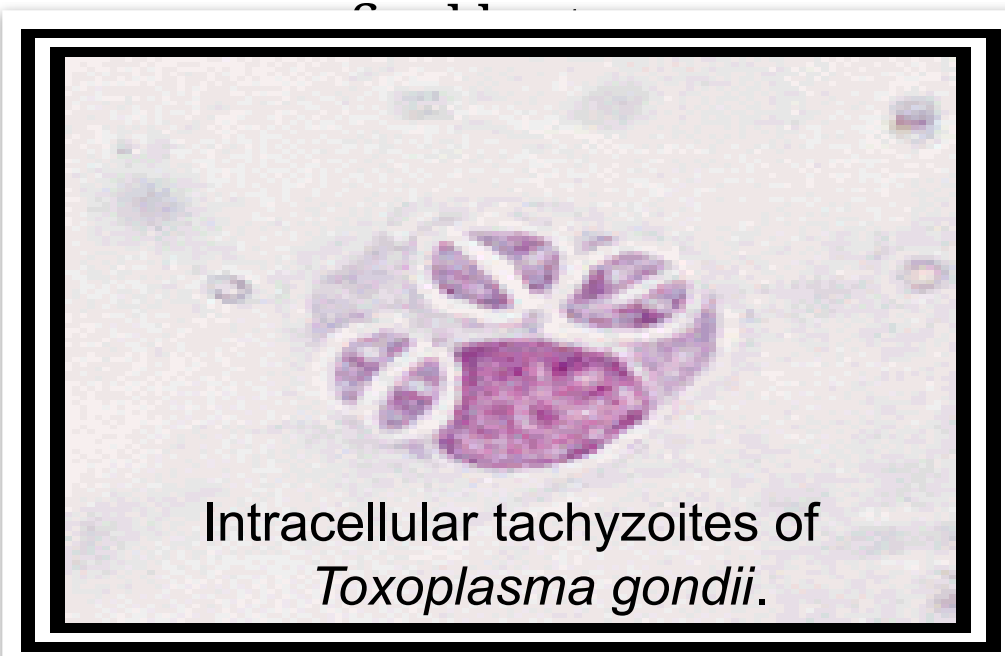




T. gondii, cyst with Bradyzoite, biopsy and autopsy (X1000)

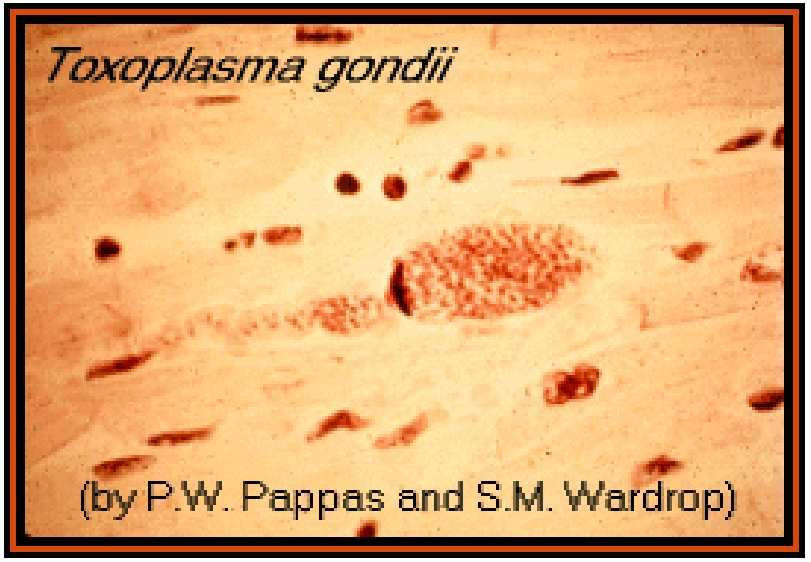
Note : the tissue section (

T. gondii Oocyst faeces smear from

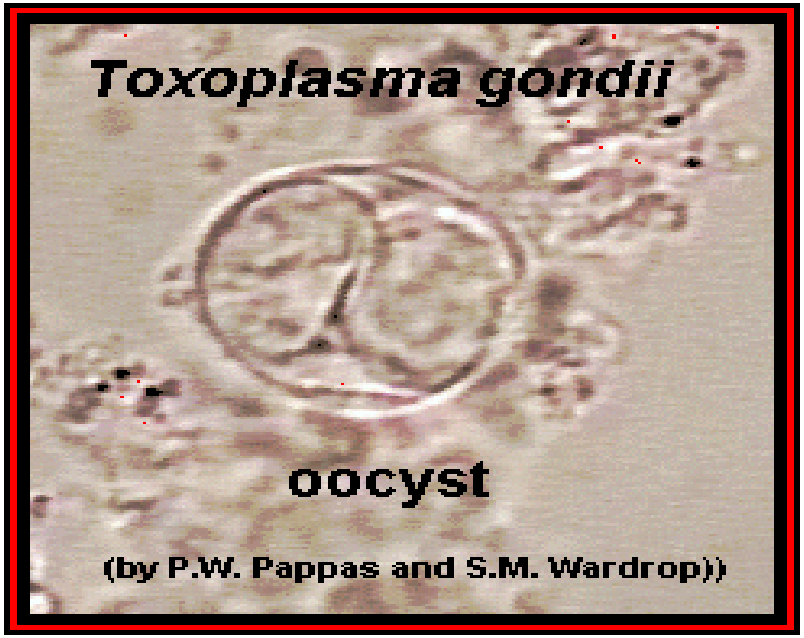


Intracellular tachyzoites of *Toxoplasma gondii*.

- A zoitocyst(tissue Cyst) of *Toxoplasma gondii* filled with bradyzoites; this zoitocyst is in cardiac muscle.



- A sporulated oocyst of *Toxoplasma gondii*. The oocyst contains two sporocysts, each of which contain four sporozoites. Thus, they resemble the oocysts of *Isospora* sp. Only cats will produce and pass *Toxoplasma* oocysts; approximate diameter = 10 µm.



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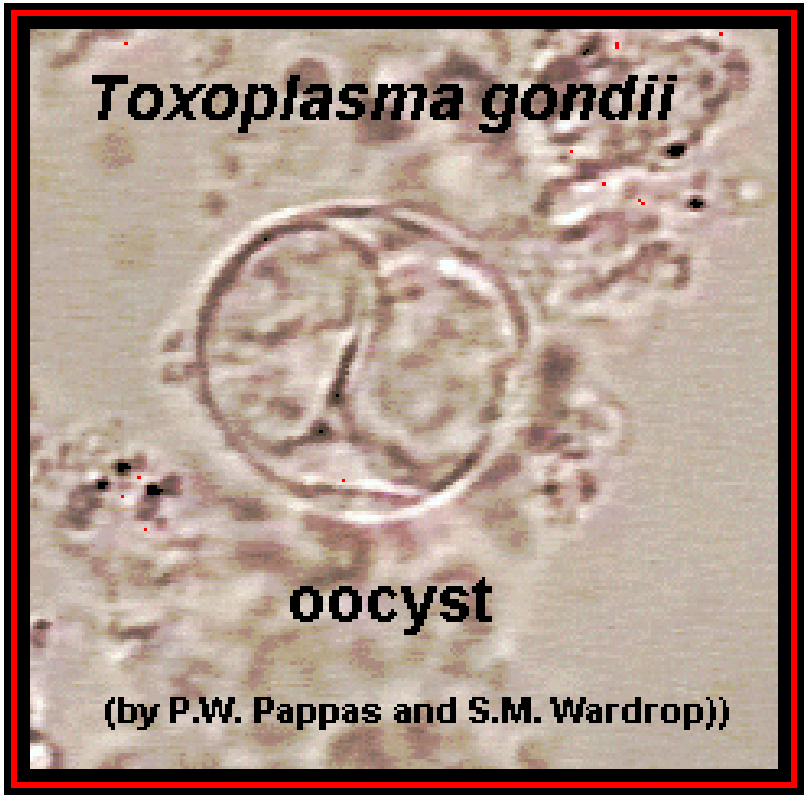

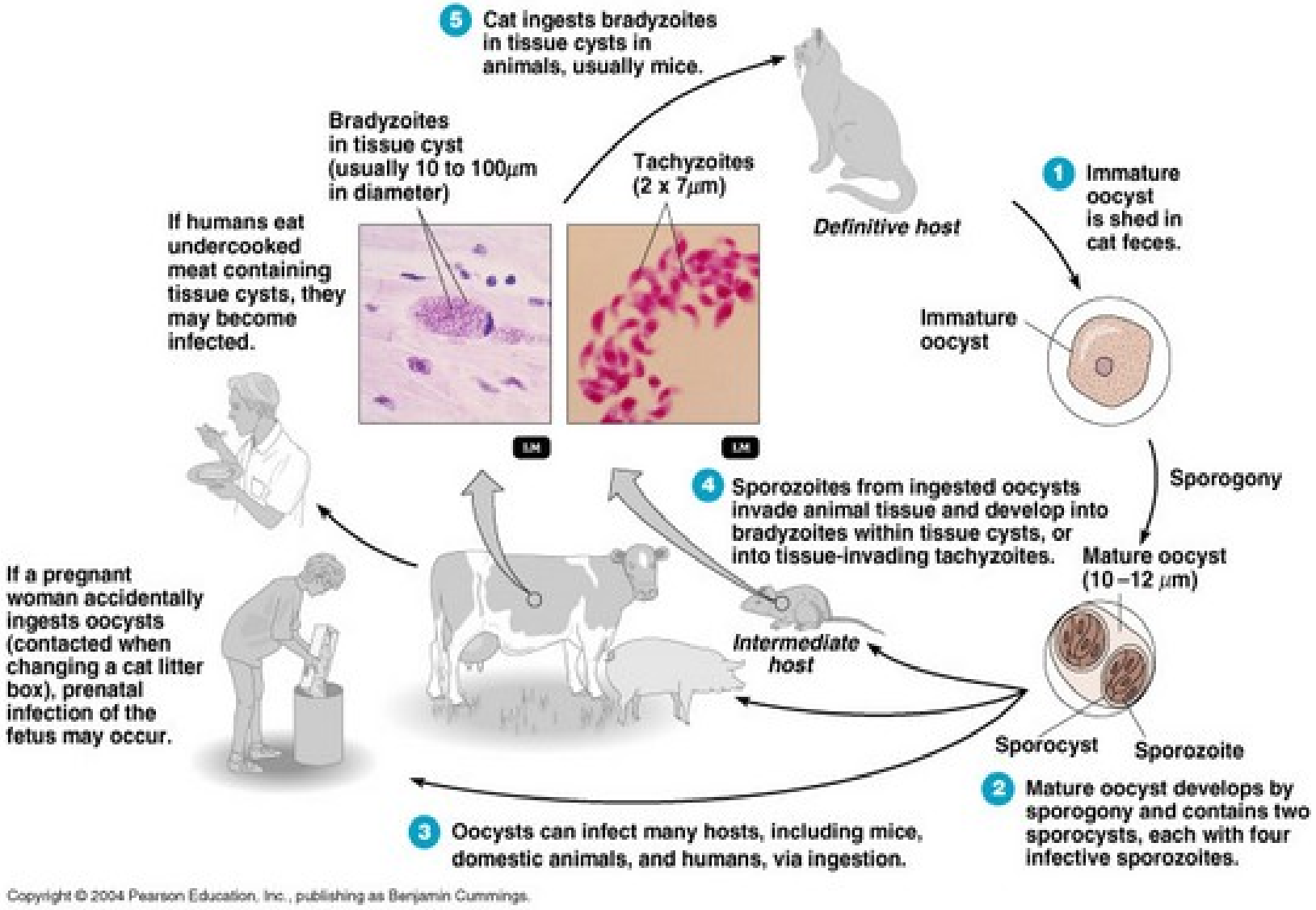

Life cycle of Toxoplasma gondii

Symptoms

- Although Toxoplasma infection is common, it rarely produces symptoms in normal individuals. Its serious consequences are limited to pregnant women and immunodeficient hosts. Congenital infections occur in about 1-5 per 1000 pregnancies of which 5-10% result in miscarriage, 8-10% result in serious brain and eye damage to the fetus, 10-13% of the babies will have visual handicaps. Although 58-70% of infected women will give a normal birth, a small proportion of babies will develop active retino-chorditis or mental retardation in childhood or young adulthood.

- In immunocompetent adults, toxoplasmosis, may produce flu-like symptoms, sometimes associated with lymphadenopathy. In immunocompromised individuals, infection results in generalized parasitemia involvement of brain, liver lung and other organs, and often death.

- Typically, human toxoplasmosis produces only mild clinical symptoms and progress to chronic state without major complications, and the latent stage of the parasite persists for the life of the host and remains clinically unapparent .
- In pregnant women, acute infection can induce a congenital disease in the unborn fetus, leading to either spontaneous abortion or mild to devastating congenital defects.
- Infection can be classified as acute, subacute and chronic.

- The first extraintestinal sites to be infected in both cats and other hosts, including humans, are the mesenteric lymph nodes and the parenchyma of the liver.
- The most common symptoms of acute toxoplasmosis are painful, swollen lymph glands in the cervical, supraclavicular and inguinal regions.
- If immunity develops slowly, the condition can be prolonged and is then called subacute, in which pathogenic conditions are extended.
- Tachyzoites continue to destroy cells, causing extensive lesions in the lung, liver, heart, brain and eyes.

Diagnosis

- **various serological tests**
- **active (acute) vs chronic infection**
  - **compare samples at 2 week intervals**
  - **IgM > IgG; ↑ Ab titers**
- **direct parasite demonstration**
  - **Sabin-Feldman dye test**
  - **biopsy**
  - **inoculation into mice or cell culture (only acute stage)**

Serological Diagnosis

1- Sabin-Feldman Dye Test (SFDT)

It is based on a complement-mediated cytolysis of antibody coated live *T. gondii* tachyzoites.

2- Indirect Fluorescent Antibodies Test (IFAT)

3- Indirect Haemagglutination Test (IHAT)

4- Complement Fixation Test (CFT)

5- Direct Agglutination Test (DAT)

6- Latex Agglutination Test (LAT)

7- ELISA

8-Dipstick Dye Immunoassay (DDIA)

ALGORITHM FOR SERODIAGNOSIS OF TOXOPLASMOSIS