

Name: Toxoplasma gondii

BSL: 2+

1. Mode of Transmission to Humans (e.g. inhalation, inoculation, mucous membrane exposure, etc.):

BioSafety Approved Version

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Lab transmission: Ingestion, inhalation, injection and mucous membrain exposure. Not directly transmitted from person to person except in utero.

General publics mode of transmission: Consuming undercooked infected meats (pork, mutton, beef); ingestion of infective oocysts in milk, food or water; inhalation of oocysts; transplacental; contact with soil containing infected cat feces; transmission through blood transfusions or organ transplantations is possible although rare; may be transmitted to food by flies or cockroaches; at least one outbreak attributed to contaminated water supply

2. Description of the Human Disease associated with this agent or vector (including instances of laboratory acquired infections):

**PATHOGENICITY:** Most infections are asymptomatic; mild cases with a localized lymphadenopathy accompanied with fever, sore throat, rash, mimicking infectious mononucleosis in some individuals; immunocompromised host suffers from widespread dissemination of the infection with pneumonitis, myocarditis, and encephalitis; some immunocompetent individuals develop severe symptoms; congenital cases can result in abortion and stillbirth, live births may result in severe central nervous system involvement along with chorioretinitis; transplacental infection is least likely during 1st trimester, but these cases are the most severe; responsible for 35% of chorioretinitis cases in US and Europe

**EPIDEMIOLOGY:** Worldwide; 3-70% of healthy adults are seropositive; increased cases of cerebral toxoplasmosis in AIDS patients (up to 50%); higher incidence in the tropics and lower in cold, arid regions

**HOST RANGE:** Cats and other felines; most warm blooded animals and birds; humans

**INFECTIOUS DOSE:** Not known

**INCUBATION PERIOD:** 10-23 days - following ingestion of contaminated meat 5-20 days - associated with cats (presumably ingestion or inhalation)

**COMMUNICABILITY:** Not directly transmitted from person-to-person except in utero; oocysts shed by cats become infective (sporulate) on average 1-5 days later, but varies with temperature; remain infectious for up to 1 year in water or moist soil; cysts in meat are infectious as long as meat is edible and uncooked

**OTHER PRECAUTIONS:** Pregnant women should be discouraged from working with *Toxoplasma* spp.

**LABORATORY-ACQUIRED INFECTIONS:** Most common laboratory-acquired parasitic infection; 28 cases with one death reported up to 1976; cases were caused by accidental inoculation, splashing, inhalation, ingestion

3. Personnel Protection Required (minimum requirement):

	Laboratory	Vivarium		Laboratory	Vivarium
Safety Glasses	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Shoe Covers	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Lab Coat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Face Shield	<input type="checkbox"/>	<input type="checkbox"/>
Gloves	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Cap/Head Cover	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Goggles	<input type="checkbox"/>	<input type="checkbox"/>	Mask	<input type="checkbox"/>	<input type="checkbox"/>
Disposal Gowns	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other - Describe:	N-95 respirator is required for work with BSL-2 agents in animals outside a BSC				

4. Engineering Controls (minimum requirement):

	Laboratory	Vivarium		Laboratory	Vivarium
Autoclave	<input type="checkbox"/>	<input type="checkbox"/>	Engineered Sharps Protection	<input type="checkbox"/>	<input type="checkbox"/>
BioSafety Cabinets	<input type="checkbox"/>	<input type="checkbox"/>	Sharps Containers	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Closed Centrifuge Rotors	<input type="checkbox"/>	<input type="checkbox"/>	Closed Centrifuge Tubes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Other - Describe:	A Biosafety Cabinet must be used for all aerosolizing procedures				

5. Disposal Procedures:

Liquids: add bleach to a final concentration of 10% bleach solution (Clorox or other bleach with Cal EPA registration number), let sit for 30 minutes, dispose of in sink (best while running water). Aspirator flasks: bleach is added to aspirator flasks initially so that the final concentration will be 10%. These must be emptied at least weekly.

Solids: disposed of in labeled, double red biohazard bags held in labeled, rigid, covered containers. Transport to biohazard collection area in a closed rigid container for final disposal by EH&S. These must be emptied at least weekly.

6. Disinfection Procedures:

Surface: 10% household bleach solution made up fresh daily (Clorox or other bleach with Cal EPA registration number) allowing 5-minutes contact time.

OR

Surface: 75 ppm of CA EPA approved iodophor (e.g. Wescodyne) allowing 5-minutes contact time.

SUSCEPTIBILITY TO DISINFECTANTS: Oocysts are susceptible to iodine and formalin, resistant to most disinfectants; tachyzoites and tissue cysts are susceptible to most disinfectants; 1% sodium hypochlorite, 70% ethanol

PHYSICAL INACTIVATION: Oocysts are inactivated by temperature > 66° C in less than 10 min; tachyzoites are inactivated at pH < 4.0; tissue cysts are inactivated by freezing and thawing; cysts do not survive in 6% or higher NaCl solution

SURVIVAL OUTSIDE HOST: Oocysts are very stable and can survive up to 1 year in water or moist soil; tachyzoites can survive in body fluids up to 1 day, in whole blood for up to 50 days at 4° C; tissue cysts can survive for weeks at room temperature in body fluids

**7. Recommended/Required Vaccinations or other Medical Surveillance:**

All personnel in the laboratory, including future workers, are required to read this ECP and document that this has been done, prior to the use of *Toxoplasma gondii* in the laboratory. The Principal Investigator and individuals doing the research must verify that everyone is aware when *Toxoplasma gondii* is going to be used. This includes all members of the laboratory as well as individuals from other laboratory groups using that space. All personnel have the option to be counseled through Center for Occupational and Environmental Medicine (COEM) or the campus Occupational Health Nurse as to the increased risk to a fetus and newborn.

All women in the laboratory with childbearing potential, working with *Toxoplasma gondii* are **REQUIRED** to be counseled through Center for Occupational and Environmental (COEM) or the campus Occupational Health Nurse as to the increased risk to a fetus and newborn.

**8. Employee Exposures- first aid procedures:**

- a. Eye exposure from splash or aerosols - rinse a minimum of 15 minutes in eye wash or flush area with water.
- b. Skin exposure - wash area with soap and water for 15 minutes
- c. Needle stick and/or sharps exposure - wash wound area with soap and water for 15 minutes
- d. Contamination of clothing - remove the contaminated clothing and place in biohazard bag, shower with the emergency douse shower, and put on clean clothes.
- e. Spill or release - Monday through Friday, 8a - 4:30p call EH&S; after hours call Campus Police

**9. Employee Exposure - seek medical follow-up from the following medical providers: (TAKE THIS ECP WITH YOU)**

24-hour walk-in service:

Hospital Emergency Room Or nearest Medical Center Emergency Room

Call your campus Occupational Health contact to determine if a follow up visit is required. Most exposures will require a visit to Occupational Health.

Monday - Friday, 8a - 4:30p

**10. Report All Injuries, Illnesses, and Exposures to EH&S:**

Report the injury incident to their immediate supervisor and complete your campus injury report form

**11. Required Biosafety Training:**

Laboratory specific training on hazards, exposure evaluations, and the required precautions for experimental procedures used with this agent - provided by Principal Investigator

**12. Lab specific instructions:**