

Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Cryptosporidium spp.

CHARACTERISTICS	
<i>Morphology</i>	Cryptosporidium "Crypto" is an intracellular apicomplexan parasite. The oocyst is the infectious form that resides in the environment. After entry into the vertebrate host, the oocyst leaves the cyst form (excystation) and sporozoites are released. The latter forms target epithelial cells of the gastrointestinal or respiratory tract. Within the epithelial cell, new schizogony and merogony develop. Male and female gametogony also develop within the epithelial cell and upon fertilization, new oocysts are formed. The thick-walled oocyst is excreted from the host and the thin-walled oocyst perpetuates the infection in the host. Oocysts are infective upon excretion permitting direct fecal-oral transmission.
<i>Growth Conditions</i>	Infection of target cells and assays for life cycle development are well established.

HEALTH HAZARDS	
<i>Host Range</i>	There are many species of Crypto that infect animals and some infect humans.
<i>Modes of Transmission</i>	Drinking contaminated water or consuming contaminated food are the most frequent modes of transmission. Oocysts may also be inhaled.
<i>Signs and Symptoms</i>	Crypto causes the majority of waterborne diseases among humans in the US. The most common symptom is watery diarrhea. Other symptoms include stomach cramps, dehydration, nausea, vomiting, and fever. Some people are asymptomatic. Symptoms last approx. 2 weeks (maximum 30 days) in an immunocompetent host.
<i>Infectious Dose</i>	5-10 oocysts
<i>Incubation Period</i>	2-10 days, average 7 days.

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	None
<i>Vaccines</i>	None
<i>Diagnosis & Treatment</i>	Diagnosis of Crypto infection is made by microscopic examination of stool samples. Most individuals will recover without treatment. Prescription medicine is available for the treatment of Crypto. Immunocompromised individuals should contact a primary care physician.
<i>Surveillance</i>	Cryptosporidiosis is a nationally notifiable gastrointestinal illness.
<i>Emory Requirements</i>	Report all incidents using PeopleSoft

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections</i>	LAIs have been reported
<i>Sources</i>	Mimics natural infection routes: ingestion, fecal-oral, potentially inhalation

SUPPLEMENTAL REFERENCES	
CDC	https://www.cdc.gov/parasites/crypto/BMBL_5th_edition-Section_VIII-C

CONTAINMENT	
<i>BSL2/ABSL2</i>	All work with <i>Cryptosporidium</i> -infected samples or propagation of parasites must be conducted inside a Biological Safety Cabinet (BSC) Class II. Use face shield,

	surgical mask and eye protection for open bench work. Hand washing procedures must be carefully followed. Animal work should be conducted in the BSC. Infected animals will shed oocysts and therefore there is a risk of exposure for animal care personnel during daily husbandry procedures.
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SPILL PROCEDURES	
<i>Small</i>	Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. <u>Crypto is chlorine-resistant.</u> An EPA-registered disinfectant should be used to remove contaminating matter from surfaces (e.g., of bench tops and equipment). After organic material has been removed, 3% hydrogen peroxide (i.e., undiluted, commercial hydrogen peroxide, identified on the bottle as 3% or "10 vol" hydrogen peroxide) can be used to disinfect surfaces. Alternatively, use hydrogen peroxide wipes. Leave hydrogen peroxide for 30 minutes before repeating, at least a second time. All decontamination litter and other disposable materials should be autoclaved or similarly disinfected before disposal.
<i>Large</i>	For assistance, contact Emory's Biosafety Officer (404-727-8863), or the EHSO Spill Team (404-727-2888)

EXPOSURE PROCEDURES		
<i>Mucous membrane</i>	Flush eyes, mouth or nose for 15 minutes at eyewash station.	
<i>Other Exposures</i>	Wash area with soap and water for 15 minutes.	
<i>Reporting</i>	Immediately report incident to supervisor, complete an employee incident report using PeopleSoft.	
<i>Medical Follow-up</i>	7am-4pm (OIM): EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)	After Hours: OIM NP On Call 404-686-5500 PIC# 50464
	Needle Stick (OIM): EUH (404-686-8587) EUHM (404-686-2352)	Yerkes: Maureen Thompson Office (404-727-8012) Cell (404-275-0963)

VIABILITY	
<i>Disinfection</i>	<i>Cryptosporidium</i> is susceptible to 3% hydrogen peroxide solution.
<i>Inactivation</i>	Inactivated by moist heat, 121C for 18 minutes
<i>Survival Outside Host</i>	Long term survival outside the host and it is resistant to chlorine disinfection.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
<i>Minimum PPE Requirements</i>	At minimum, personnel are required to don gloves, closed toed shoes, lab coat, and appropriate face and eye protection prior to working with <i>Cryptosporidium</i> -infected samples. Additional PPE may be required depending on lab specific SOPs.
<i>Additional Precautions</i>	All procedures that may produce aerosols, or involve high concentrations or large volumes should be done in a BSC.