

Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Vibrio cholerae (VC)

CHARACTERISTICS	
<i>Morphology</i>	<i>Vibrio cholerae</i> (VC) is a gram negative, non-spore forming, curved rod. There are many serogroups of <i>V. cholerae</i> , but only two – O1 and O139 – cause outbreaks. <i>V. cholerae</i> O1 (VC O1) has caused all recent outbreaks.
<i>Growth Conditions</i>	Cary Blair media is ideal for transport, and the selective thiosulfate–citrate–bile salts agar (TCBS) is ideal for isolation and identification.

HEALTH HAZARDS	
<i>Host Range</i>	Humans, water birds, shellfish, fish, and herbivores have been found to contain the infectious agent
<i>Modes of Transmission</i>	Consumption of contaminated food or water. Symptomatic patients may shed <i>Vibrio</i> before clinical signs of illness and up to 2 weeks after, whereas asymptomatic patients typically only shed <i>Vibrio</i> for 1 day. Reservoirs: The bacterium has been found in birds and herbivores surrounding freshwater lakes and rivers as well as in algae, copepods (zooplankton), crustaceans and insects
<i>Signs and Symptoms</i>	Only 5-10% of persons infected with VC O1 may have illness requiring treatment at a health center. Symptoms include profuse watery diarrhea, vomiting, rapid heart rate, low blood pressure, dehydration, muscle cramps, irritability.
<i>Infectious Dose</i>	The infectious dose ranges between 10 ⁶ and 10 ¹¹ ingested <i>Vibrio</i>
<i>Incubation Period</i>	Ranges from a few hours to 5 days after infection

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	Hand washing
<i>Vaccines</i>	FDA recently approved a single dose live oral cholera vaccine for use in the United States. It has been approved for vaccination of adults 18-64 yr old who are traveling to an area of active cholera.
<i>Treatment</i>	VC is susceptible to antibiotics.
<i>Surveillance</i>	Monitor for symptoms. Confirm diagnosis by dark field microscopy of a wet mount of fresh stool, PCR or ELISA
<i>Emory Requirements</i>	Report all exposures. Cholera is a U.S. nationally reportable disease.

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	Rare cases of bacterial enteritidis due to LAI with either <i>V. cholerae</i> or <i>V. parahaemolyticus</i> have been reported
<i>Sources</i>	Pathogenic <i>Vibrio</i> can be found in human fecal samples or in contaminated shellfish. Accidental ingestion of VC results from eating with contaminated hands, using contaminated syringes or the handling of contaminated marine samples without gloves

SUPPLEMENTAL REFERENCES	
<i>Canadian PHAC</i>	http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/vibrio-cholerae-eng.php
<i>CDC</i>	https://www.cdc.gov/cholera https://www.cdc.gov/biosafety/publications/bmb15/

CONTAINMENT	
<i>BSL2/ABSL2</i>	Containment Level 2 facilities, equipment, and operational practices. No open-bench work should be performed with VC. All work should be performed inside a Biosafety Cabinet. Use of needle-safe sharps is encouraged. Centrifuge rotors must have a lid, samples should be loaded/unloaded inside the BSC and the centrifuge should be decontaminated with appropriate disinfectant after use. ABSL2 practices, containment and equipment are recommended for experimentally infected animals.

SPILL PROCEDURES	
<i>Small</i>	Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. Cover area of the spill with paper towels and apply an EPA approved disinfectant, working from the perimeter towards the center. Allow 30 minutes of contact time before disposal and cleanup of spill materials.
<i>Large</i>	Contact Emory's Biosafety Officer (404-727-8863), the EHSO Office (404-727-5922), or The Spill Response Team (404-727-2888).

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

VIABILITY	
<i>Disinfection</i>	2% chlorine, 0.5% chlorine, 0.05% chlorine
<i>Inactivation</i>	VC can be inactivated by cold (loss of viability after a cold shock at 0°C).
<i>Survival Outside Host</i>	<i>V. cholerae</i> can survive in well water for 7.5 ± 1.9 days and the El Tor biotype can survive 19.3 ± 5.1 days

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>V. cholerae</i> . Additional PPE may be required depending on lab specific SOPs.
<i>Additional Precautions</i>	Use respiratory protection if work will be performed outside the biosafety cabinet. Additional precautions should be considered with work involving animals or large scale activities.