

Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Dengue Virus (DEN1, DEN2, DEN3, DEN4)

CHARACTERISTICS	
<i>Morphology</i>	Spherical enveloped virion 40-60 nm in diameter, single-stranded, positive RNA virus surround by a icosahedral nucleocapsid.
<i>Growth Conditions</i>	Cell culture.

HEALTH HAZARDS	
<i>Host Range</i>	Humans, mosquitoes (Aedes spp. And Stegomyia spp.), and simians
<i>Modes of Transmission</i>	Virus is transmitted through the bite of infected mosquitoes, typically 2 hours after sunrise or several hours prior to sunset. Low occurrence of vertical transmission. Not directly transmitted from person to person.
<i>Signs and Symptoms</i>	<u>1st Exposure:</u> Sudden onset of fever for 3-5 days with an intense headache, myalgia, arthralgia, retro-orbital pain, anorexia, and rash. <u>2nd Exposure:</u> Dengue hemorrhagic fever is characterized by abnormal vascular permeability, hypovolemia, and abnormal clotting mechanisms. Fatality rate is 40-50%.
<i>Infectious Dose</i>	Human LD ₅₀ : <10 PFU. Fewer than 10 PFU led to infection in 50% of volunteers treated with an attenuated Dengue virus vaccine candidate.
<i>Incubation Period</i>	Ranges from 3-15 days but is typically 4-7 days.

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	None available.
<i>Vaccines</i>	None available.
<i>Treatment</i>	No specific treatment available. Take non-aspirin pain relievers and drink plenty of water.
<i>Surveillance</i>	Monitor for symptoms and confirm by serological or molecular tests.
<i>Emory Requirements</i>	Report all exposures.

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	Up to 1988, 11 cases have been reported. One case resulted from splashing infectious material in the face. Potential hazards include accidental, parenteral inoculation and contact with broken skin or mucous membranes. Updated: There have been 14 reported cases of laboratory acquired infections with no deaths
<i>Sources</i>	Sources include blood, cerebral spinal fluid, tissues and infected mosquitoes. Environmental samples from mosquito habitats are also sources of infection.

SUPPLEMENTAL REFERENCES	
<i>Canadian MSDS</i>	http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/msds50e-eng.php
<i>BMBL: 5th Edition</i>	http://www.cdc.gov/OD/ohs/biosfty/bmb15/BMBL_5th_Edition.pdf
<i>CDC Guidelines</i>	http://www.cdc.gov/dengue/

CONTAINMENT REQUIREMENTS	
<i>BSL-2</i>	In vitro work involving the virus.
<i>ACL-2</i>	In vivo work involving infectious mosquitoes.

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 registered 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 Exposures</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>	<u>7am-4pm (OIM):</u> EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)
	<u>After Hours:</u> OIM NP On Call 404-686-5500 PIC# 50464
	<u>Needle Stick (OIM):</u> EUH (404-686-8587) EUHM (404-686-2352)
	<u>Yerkes:</u> Maureen Thompson Office (404-727-8012) Cell (404-275-0963)

VIABILITY	
<i>Disinfection</i>	Susceptible to 70% ethanol, 10% bleach, 2% glutaraldehyde, 1% sodium hypochlorite, 2% peracetic acid, iodophors, phenolic compounds, and 3-6% hydrogen peroxide
<i>Inactivation</i>	Sensitive to heat and low pH.
<i>Survival Outside Host</i>	The virus is stable in dried blood for up to 9 weeks at room temperature.

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 Dengue virus. Additional PPE may be required depending on lab specific SOPs.
<i>Additional Precautions</i>	Additional precautions should be taken when working with sharps. Minimize sharps use whenever possible. Adhere to recommendations listed in the Sharps Guidelines .