Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Dengue Virus (DEN1, DEN2, DEN3, DEN4)

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

HEALTH HAZARDS	
Host Range	Humans, mosquitoes (Aedes spp. And Stegomyia spp.), and simians
Modes of Transmission	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.
Signs and Symptoms	1st Exposure: Sudden onset of fever for 3-5 days with an intense headache, myalgia, arthralgia, retro-orbital pain, anorexia, and rash. 2nd Exposure: Dengue hemorrhagic fever is characterized by abnormal vascular permeability, hypovolemia, and abnormal clotting mechanisms. Fatality rate is 40-50%.
Infectious Dose	Human LD_{50}: <10 PFU. Fewer than 10 PFU led to infection in 50% of volunteers treated with an attenuated Dengue virus vaccine candidate.
Incubation Period	Ranges from 3-15 days but is typically 4-7 days.

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

LABORATORY HAZARDS	
Laboratory Acquired Infections (LAIs)	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
Sources	Sources include blood, cerebral spinal fluid, tissues and infected mosquitoes. Environmental samples from mosquito habitats are also sources of infection.

SUPPLEMENTAL REFERENCES	
Canadian MSDS	http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/msds50e-eng.php
BMBL: 5th Edition	http://www.cdc.gov/OD/ohs/biosfty/bmbl5/BMBL_5th_Edition.pdf
CDC Guidelines	http://www.cdc.gov/dengue/

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

SPILL PROCEDURES	
Small	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.
Large	Contact Emory's Biosafety Officer (404-727-8863), the EHSO Office (404-727-5922), or The Spill Response Team (404-727-2888).

EXPOSURE PROCEDURES		
Mucous membrane	Flush eyes, mouth or nose for 15 minutes at eyewash station.	
Other Exposures	Wash area with soap and water for 15 minutes.	
Reporting	Immediately report incident to supervisor, complete an employee incident report in PeopleSoft.	
Medical Follow-up	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	
Disinfection	Susceptible to 70% ethanol, 10% bleach, 2% glutaraldehyde, 1% sodium hypochlorite, 2% peracetic acid, iodophors, phenolic compounds, and 3-6% hydrogen peroxide
Inactivation	Sensitive to heat and low pH.
Survival Outside Host	The virus is stable in dried blood for up to 9 weeks at room temperature.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
Minimum PPE Requirements	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.
Additional Precautions	Additional precautions should be taken when working with sharps. Minimize sharps use whenever possible. Adhere to recommendations listed in the Sharps Guidelines.