

CHARACTERISTICS

Synonym or Cross Reference	Dengue fever, break bone fever, Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS), DENV, DEN
Disease	Dengue Virus Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS)
Morphology	Flaviviridae family, Flavivirus genus - arbovirus. 40-60 nm enveloped virus/isometric nucleocapsid 25-30 nm; ~10.7 kb, linear, positive-sense RNA genome. 4 serotypes (Dengue 1–4); genetically related to other flaviviruses (e.g., yellow fever, tick-borne encephalitis).
Zoonosis	Yes,via infected mosquitoes.

RISK GROUP & CONTAINMENT REQUIREMENTS

ABSL-2	For all procedures utilizing infected animals.
BSL-2/BSL-2+	For all procedures involving suspected or known infectious specimen or cultures, work in a BSC unless otherwise approved and stated in lab-specific manual.
Risk Group 2	Agents associated with human disease that are rarely serious and often have preventive or therapeutic interventions available.

LABORATORY HAZARDS

Primary Hazards	Parenteral inoculation; bites from experimentally infected mosquitoes - potentially infectious.
Sources	Samples described in IBC protocol.
Lab Acquired Infections (LAIs)	There have been 14 reported cases of laboratory acquired infections with no deaths.

PERSONAL PROTECTIVE EQUIPMENT

Additional Precautions	Additional PPE may be required depending on lab-specific SOPs and IBC Protocol.
Minimum PPE Requirements	Lab coat, disposable gloves, safety glasses, closed toed shoes, long pants.

SPILL PROCEDURES

Large	Immediately notify all lab personnel and clear the area. Remove any contaminated PPE/clothing before exiting the lab. Lock all entry doors, post warning signage, and deny entry. Call DPS (213-740-4321) and ask to notify EH&S. Inform the PI and/or Lab Manager/Supervisor.
Small	Notify all lab personnel lab. Remove contaminated PPE and don new PPE. Cover spill area with absorbent material and add fresh 1:10 bleach:water. Allow 20 minutes (or as directed) contact time. After 20 minutes, clean up and dispose of materials.

VIABILITY

Disinfection	Use 10 % dilution of household bleach (minimum 0.3% sodium hypochlorite) for 20 to 30 minutes, or an acceptable time approved by IBC and EH&S.
Survival Outside Host	The virus is stable in dried blood for up to 9 weeks at room temperature

HEALTH HAZARDS

Host Range	Humans, Simians, and Mosquitoes
Incubation Period	Average incubation period is 4-7 days (range of 3-15 days)
Infectious Dose	Human ID50 is <10 PFU. Fewer than 10 PFU can lead to infection in 50% of volunteers treated with an attenuated dengue virus vaccine candidate.
Modes of Transmission	Transmitted to humans through mosquito bites or through contaminated blood transfusion.
Signs and Symptoms	Influenza type symptoms, fever, rash, myalgias, arthralgias and febrile period lasting 2 to 10 days. Hemorrhagic fever risk is higher after secondary infection with other dengue serotypes. High fever, hemorrhagic diathesis, hepatomegaly, and shock are clinical manifestations of DHF and DSS. Hemorrhagic fever mortality rates up to 20%.

EXPOSURE PROCEDURES

Medical Follow-up	Visit USC’s designated healthcare provider. Bring a copy of this PSDS.
Mucous Membrane	Flush eyes for 5-10 minutes at eyewash station.
Other Exposures	Immediately wash affected area with soap and water for 15 minutes.
Reporting	Immediately report incident to supervisor, notify EH&S, and complete Manager’s Report.

MEDICAL PRECAUTIONS/TREATMENT

Prophylaxis	None
Surveillance	Monitor for symptoms. Realtime PCR assay measures RNA number as indicator of viral load. ELISA detects Dengue-induced seroconversion. Detection of NS1, NS2, NS3 and NS5 protein antibodies can aid in evaluating risk of DHF development. RT-PCR detects the virus directly.
Treatment	Monitor patient’s vital signs closely. Transfuse plasma/blood in cases of severe hemorrhagic fever. Dextran 70 solns treat hemorrhagic shock.
USC Requirements	Immediately report any exposures to Environmental Health & Safety.
Vaccines	No vaccine

REFERENCES

BMBL http://tiny.cc/cdc-bmb1	Canadian PSDS http://tiny.cc/canada-gov-psds
CDC https://www.cdc.gov/	NIH Guidelines http://tiny.cc/nih-bio-secure
Virginia Tech http://tiny.cc/vt-psds	

