**Biohazardous Agent Reference Document (BARD) and**

**Information for Healthcare Providers in the Event of an Exposure**

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| The BARD is an additional guidance tool. It is not a substitute for a risk assessment, biosafety training, lab-specific training, SOP as required by the IBC or a formal [IBC master protocol registration](https://www.uvm.edu/rpo/biosafety-oversight). This document must be readily available in the laboratory, and it is the responsibility of the Laboratory Supervisor or Principal Investigator to ensure that all personnel have read and understood the information. The BARD is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Please bring this IBC-approved BARD with you to the UVMMC Emergency Department if there has been an exposure and someone requires medical assistance.  INSTRUCTIONS for BARD Preparation   1. Complete the blue Information for Healthcare Providers section. 2. Review the standard information contained in the green section of this document. 3. Add/revise information that is specific to your work in the laboratory (such as strain-specific information). Please be sure that the track changes function is turned on to indicate any changes that you make. 4. Submit the BARD along with your IBC master protocol registration or amendment. 5. Once approved by the IBC, all personnel must review this BARD. The PI will attest during the submission of the registration or amendment to add new personnel that each lab member has read and understands the material. | |
| **Information for Healthcare Providers**  Dear Healthcare Provider,  This individual works in a UVM research laboratory and has been exposed to a pathogen or toxin. Information about the materials this person may have been exposed to is listed below. You may also find useful additional information in subsequent pages of this reference document. | |
| **Pathogen Name:** | Dengue Virus (DENV) |
| **Pathogen/Toxin Classification:** |  |
| **List All Strains Used in the Laboratory:** |  |
| **List Resistant Genes Known to be Encoded:** |  |
| **Modes of Transmission *(mucous membranes, needle stick, inhalation)*:** | Blood borne, bite from an infected mosquito, contact with non-intact skin or mucous membranes |
| **Known Medical Precautions and Treatment** | |

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| **Prophylaxis** | None available |
| **Vaccines** | Under development |
| **Treatment and/or Post-exposure Intervention** | Monitor vital signs closely, plasma and/or blood transfusion in cases of sever hemorrhagic fever, solutions with dextran 70 have been used to treat hemorrhagic shock |
| **Surveillance** | Monitor for symptoms and test using serology or RT-PCR |
| **Additional Medical Precautions (immunosuppression, pregnancy, allergies)** |  |

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| **Health Hazards** | |
| **Host Range** | Humans, simians, mosquitoes |
| **Signs and Symptoms** | Influenza-type symptoms, fever lasting 2 – 10 days, rash, muscle and joint pain. May progress to Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS): high fever, hemorrhage, liver organomegaly, shock. Mortality rates for DHF can reach 20%. |
| **Infectious Dose** | < 10 PFU (plaque forming units) |
| **Incubation Period** | Usually 4 – 7 days (range of 3 – 15 days) |
| **Exposure Procedures** | |
| **Mucous membranes** | Flush eyes, mouth or nose for 15 minutes at eyewash station. |
| **Other exposures** | Wash area with soap and water for 15 minutes |
| **Medical Follow-Up** | Contact UVMMC Infectious Disease Dept. directly at **(802) 847-2700** for immediate assistance. Bring this document with you if seeking medical care. |
| **Reporting** | Report all exposures or near misses to:   1. Your immediate Supervisor 2. SOS at 802-656-2560 and ask to have the EH&S team paged 3. Risk Management: <https://www.uvm.edu/riskmanagement/incident-claim-reporting-procedures> |
| **Laboratory Hazards** | |
| **Laboratory Acquired Infections** | 14 reported cases of lab-acquired infections, no deaths |
| **Sources** | Blood, cerebrospinal fluid, organs, tissues from infected humans & animals; human, non-human primate, and mosquito cell lines, and environmental samples or mosquitoes from infected areas. |
| **Characteristics** | |
| **Morphology** | Member of the Flaviviridae family, enveloped virus. |
| **Strain Specific Characteristics** | Four serotypes exist (Dengue 1 – 4), wild-type and attenuated strains. |
| **Containment Requirements** | |
| **BSL - 2** | Manipulation of known or potentially infected clinical samples and cell cultures of laboratory adapted strains (RG2) |
| **BSL - 3** |  |
| **ABSL - 2** | Work with animals infected with risk group 2 strains |
| **ABSL - 3** |  |
| **Aerosol generating activities** | Centrifugation, homogenizing, vortexing or stirring, changing of animal cages, cell sorting, pipetting, pouring liquids, sonicating, loading syringes |
| **Primary containment device (BSC)** | Use for aerosol-generating activities, high concentrations, or large volumes |
| **Personal Protective Equipment (PPE)** | |
| ***Minimum PPE Requirements*** | Nitrile gloves, lab coat, appropriate eye/face protection. Wash hands after removing gloves. |
| ***Additional Precautions***  ***(Risk assessment dependent)*** | Sharps use strictly limited |
| **Viability** | |
| **Disinfection** | Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde, 2% peracetic acid, TRIzol, phenolic compounds, 70% ethanol, iodophors, 3-6% hydrogen peroxide; all with a contact time of at least 10 minutes |
| **Inactivation** | Inactivated by autoclaving (121°C for 15 minutes), dry heat 160-170°C for at least 1 hour, or low pH (at or below pH 3) |
| **Survival Outside Host** | Capable of surviving in dried blood for up to 9 weeks at room temperature |
| **Spill Clean-Up Procedures** | |
| **Small Spill** | Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. Cover area of the spill with paper towels and apply approved disinfectant, working from the perimeter towards the center. Allow 30 minutes of contact time before clean up and disposal. Dispose in double biowaste bags and biobox. |
| **Large Spill** | **Inside of a lab:** Call UVM Service Operations at 656-2560 and ask to speak to a dispatcher. Ask them to page Risk Management and Safety.  **Outside of the lab:** Pull the nearest fire alarm and evacuate the building. Wait out front of the building for emergency responders to arrive. |
| **References** | |
| **Canadian PSDS** | <https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/dengue-fever-virus-1-2-3-4-pathogen-safety-data-sheet.html> |
| **BMBL** | <https://www.cdc.gov/biosafety/publications/bmbl5/> |
| **CDC Guidelines** | <https://www.cdc.gov/dengue/index.html> |
| **Current Protocols in Microbiology** | <http://onlinelibrary.wiley.com/doi/10.1002/9780471729259.mc15d02s27/abstract> |