

BIOHAZARDOUS AGENT REFERENCE DOCUMENT

Lymphocytic choriomeningitis virus (LCMV)

The Biohazardous Agent Reference Document (BARD) is a general guidance resource that reviews and summarizes the nature of a pathogen or biotoxin, and offers safety requirements for work with the agent in the laboratory. The BARD may replace the formal SOPs used in conjunction with some IBC registrations.

The BARD is provided as an additional guidance tool, and is not a substitute for a risk assessment, biosafety training, lab-specific training, or a formal [IBC master protocol registration](#). This document should 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, understood, and signed the document. The BARD is for informational purposes only, and is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Please consult a health care provider for any medical questions or concerns.

INSTRUCTIONS

- 1. Review the information contained in this document.**
- 2. Add any necessary 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.**
- 3. Instruct all personnel to review the BARD and sign the last page, indicating that they have read and understood the information.**
- 4. Submit the BARD along with your IBC master protocol registration, amendment, or continuing review.**

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CHARACTERISTICS

Morphology	Member of the Arenaviridae family, enveloped virus.
Strain Specific Characteristics	<u>Armstrong strain</u> : in mice, increases viral titers for 3-4 days then declines to clear completely. <u>Clone 13 strain</u> : increases viral titers for months after infection and causes immunosuppression. It is thought that the clone 13 strain is more virulent and has caused lab-acquired infections. <u>We strain</u> : has been found to be lethal in non-human primates (NHPs).

HEALTH HAZARDS

Host Range	House mice are natural hosts. LCMV can also infect humans and other animals (hamsters, guinea pigs, NHPs)
Modes of Transmission	LCMV is excreted through mouse urine, saliva, and feces, Transmission occurs through inhalation, ingestion, contact with mucous membranes, and breaks in the skin. Vertical transmission is possible from mother to child. There is no other evidence of human to human transmission.
Signs and Symptoms	<u>First Phase</u> : febrile illness (fever, lack of appetite, muscle aches, nausea, vomiting, headache, and malaise). <u>Second Phase</u> : meningeal symptoms, encephalitic symptoms, and myelitis (swelling of the spinal cord).
Infectious Dose	Unknown
Incubation Period	8 – 13 days

MEDICAL PRECAUTIONS / TREATMENT

Prophylaxis	None available
Vaccines	None available
Treatment	None available
Surveillance	Monitor for symptoms and test using serology and viral isolation
UVM IBC Requirements	Report any exposures or signs and symptoms to your supervisor
Additional Medical Precautions	Women who are pregnant or planning on becoming pregnant should be aware that pregnant women infected with LCMV can transmit the virus to their fetus. This can result in loss of pregnancy or serious birth defects.

LABORATORY HAZARDS

Laboratory Acquired Infections	There have been well documented LAI's from infected animals and contaminated cell lines. 46 cases with 5 deaths have been documented.
Sources	Urine, saliva, blood, tissues, cerebrospinal fluid, nasopharynx secretions, and feces from infected humans, animals and contaminated cell lines.

CONTAINMENT REQUIREMENTS

BSL - 2	Manipulation of known or potentially infected clinical samples and cell cultures of laboratory adapted strains (RG2)
BSL - 3	Manipulations involving high aerosol potential, high concentrations or volumes of virus, and strains lethal to NHP's (RG3).
ABSL - 2	Work with animals infected with risk group 2 strains
ABSL - 3	Work with animals infected with RG3 strains.
Aerosol generating activities	Centrifugation, homogenizing, vortexing or stirring, changing of animal cages, animal surgeries, cell sorting, pipetting, pouring liquids, sonicating, loading syringes
Primary containment device (BSC)	Use for aerosol-generating activities, high concentrations, or large volumes

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 UVM Infectious Disease Dept. directly at (802) 847-2700 for immediate assistance
Reporting	Report all exposures or near misses to: <ol style="list-style-type: none"> Your immediate Supervisor The UVM Biosafety Officer at (802) 777-9471 and Risk Management at 6-3242 Risk Management and Safety; https://www.uvm.edu/riskmanagement/incident-claim-reporting-procedures

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. Due to modes of transmission, respirators may be required when working with LCMV. Medical clearance, fit testing and training is required annually per UVM's Respiratory Protection Program; https://www.uvm.edu/riskmanagement/personal-protective-equipment

Principal Investigator: _____

IBC Registration #: _____

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VIABILITY	
Disinfection	Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde, 70% ethanol, and formaldehyde; with 15-minute contact time
Inactivation	Inactivated by heat above 55°C for 20+ minutes
Survival Outside Host	Capable of surviving outside of host in mouse droppings

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 press option 1 to speak to a dispatcher. Ask them to page Risk Management and Safety. Outside of a lab: Pull the nearest fire alarm and evacuate the building. Wait out front of the building for emergency responders to arrive.

REFERENCES	
Canadian PSDS	http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/lymp-cho-eng.php
BMBL	https://www.cdc.gov/biosafety/publications/bmb15/
CDC LCMV Guidelines	https://www.cdc.gov/vhf/lcm/index.html
Current Protocols in Microbiology	Welsh, RM et Al. (2008). Lymphocytic Choriomeningitis Virus (LCMV): Propagation, Quantitation, and Storage. https://www.ncbi.nlm.nih.gov/pubmed/18770534

STUDENT / EMPLOYEE NAME	SIGNATURE	DATE

Biosafety Review:

Jeff LaBossiere, Biological Safety Officer

Date

Principal Investigator: _____

IBC Registration #: _____