Lentivirus Exposure  
Medical Response Guidance  
for the University of Wisconsin

**Instructions:** Information in this guidance is meant to inform both laboratory staff and health professionals about the risks and treatment of infectious agent exposures. In developing this guidance, please consider that multiple routes of exposure may occur in a lab and that organism strains will sometimes be genetically modified to incorporate traits such as antimicrobial resistance. Research protocols and other available guidance such as Health Canada material safety data sheets will be provided as supporting information when available. It should be assumed that when exposures do occur, that the healthcare provider will be provided information about the specific strain involved, route of exposure, inoculum concentration, and victim vaccination and serological status, when available. If there are any questions about this document, please contact Jim Morrison, UW Occupational Health Officer at 263-2177 or jmorrison@fpm.wisc.edu.

**Signs and Symptoms of Infection** - Describe signs and symptoms associated with the agent.

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<th>There are no known infections due to the lentiviral vector pLL3.7-MIT.</th>
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<td>Third-generation lentiviral vectors are derived from HIV, but they have been modified significantly so that they pose minimal, if any, risk. They are considered so safe that human trials of genetic therapeutic interventions routinely use them. Lentiviral vectors are produced through transient co-infection of cells with three plasmids (packaging, envelope and transfer plasmids). Splitting the viral genome protects against generation of replication-competent recombinants.</td>
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<td>The packaging plasmid pLL3.7-MIT contains <em>gag</em> and <em>pol</em> genes. <em>Gag</em> encodes matrix and core proteins. While they are sufficient to form particles when expressed from transfected cells, these self-assembled particles are non-infectious. <em>Pol</em> encodes three enzymes- protease, reverse transcriptase, and integrase. Although integrase mediates the linkage of double stranded viral DNA into the host genome, where it can become a stable genetic element, this integration also requires proteins encoded on other plasmids. Without these additional components, the genetic material forms an episomal circle. The following genes have been deleted from the packaging plasmid: <em>env, tat, rev, vpr, vpa, vif,</em> and <em>nef.</em></td>
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<td>Potentially most important, this packaging vector lacks both HIV-derived long terminal repeats (LTRs). In HIV, the LTRs serve as a eukaryotic transcription unit. In the packaging plasmid, these have been replaced by a self-inactivating LTR. The plasmid LTR has a TATA box deletion so that a critical cellular transcription factor cannot bind and initiate transcription of lentiviral genes. Therefore, transgenes are reliant on an internal promoter. Self-inactivating LTRs reduce the risk of host gene transactivation, replication-competent recombinants, and mobilization upon superinfection with wild-type...</td>
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Enveloped (VSVG) is expressed on a separate vector. Rev is supplied on a third vector, RSV-rev. As states previously, together, these modifications make working with lentiviral vectors in a laboratory setting a safe undertaking.

**Infectivity** - Describe infective dose, relevant exposure routes (considering laboratory use), incubation period and potential severity of infection.

There is no known risk for infection.

**Description of First Aid** - Provide an overview of first aid treatment of exposures considering that multiple routes of exposure could occur (needlestick, aerosol, eye, skin and ingestion).

First Aid should be based off the mechanical injury.

- If needle puncture, laceration, scratch or broken skin occurs
  1) Squeeze the puncture or open area to induce bleeding
  2) Cleanse area thoroughly with soap and water (minimum of 3 minutes)

- If a mucus membrane or eye exposure occurs
  1) Irrigate affected area immediately with copious amounts of water or normal saline for at least 3 minutes

- If inhalation exposure suspected
  2) Vacate lab immediately, close doors and contact Occupational Health

**Urgency of Medical Care** - Describe how soon medical attention should be sought, i.e. is an ER visit necessary, visit to University Health, or simply schedule a visit with a personal physician.

Medical care for exposure to the lentiviral vector is not indicated for the reasons cited above.

However, the injuries associated with the exposure may require medical evaluation and should be seen within 24 hours by either University Health or the UWHC Emergency Room (after hours).
**Description of Medical Response** - Provide an overview for clinical treatment of exposures to the agent considering that multiple routes of exposure could occur (needlestick, aerosol, eye, skin and ingestion) and that strains of agents will vary and sometimes include antimicrobial resistance.

1) Healthcare provider should re-wash the exposed area as described above in First Aid section.

2) Healthcare provider should document date, time, and location of injury and the type of potential pathogen involved in exposure

3) Evaluation of general health including medications and the date of the last tetanus booster

4) Determine the need for standard antibiotic therapy for prevention of bacterial infection due to injury, as done typically for any break in the skin

5) Safety precautions should be reviewed with the patient and work supervisor in order to avoid future exposure events

**Description of Medical Surveillance** - Describe the advisability of medical surveillance strategies (in particular baseline and annual serology) for those working with the agent. If doing so would likely improve the identification, diagnosis or treatment of exposures, please indicate so.

| No routine medical surveillance is needed. |

References


**Completed By:**

Department:

Phone:

eMail:

Date: