

Guidance document for the safe handling of lentiviruses

The National Institutes of Health recommends that replication-incompetent lentiviral particles be classified as Risk Group 2 agents. ASU requires first and second-generation lentiviruses to be handled at BSL-2+ and third and fourth generation to be handled at BSL-2. Containment requirements for BSL-1 to BSL-4 are described in [Biosafety in Microbiological and Biomedical Laboratories](#).¹

In BSL-2+ labs at ASU, BSL-3 practices are used in BSL-2 rated facilities. This means that laboratories must follow BSL-2 containment requirements plus:^{2,3,4}

1. All work with lentiviruses must be performed in a certified biological safety cabinet.
2. Eye protection and a laboratory coat is required when working with biohazardous materials.
3. The use of double gloves and a lab coat dedicated exclusively to the work with lentivirus are recommended.
4. Sealed rotors or safety cups are required when centrifuging. Rotors and cups must be opened only inside a BSC when loading and unloading samples. When removed from the BSC, rotors and cups must be decontaminated with a method approved for the organism used.
5. Use of glassware or sharps such as needles should be eliminated or minimized as much as possible. A Standard Operating Procedure describing how sharps and glassware are used in the laboratory is required.
6. A SOP describing what to do in the event of an incident or exposure while working with working with the lentivirus must be prepared and be made available to personnel working in the laboratory.

In a laboratory, individuals might be exposed to lentivirus through dermal exposure (e.g., via sharps such as needlesticks), absorption (e.g., through exposed scratches or abrasions on skin), or mucous membrane exposure (e.g., to the eyes, nose, and mouth). Lentivirus may also be inhaled via aerosols (e.g., using centrifuges or vortex mixers). Care must be taken when pipetting in order to avoid splashing or generating aerosols. Immunocompromised individuals should not work with lentivirus.

EHS recommends that laboratory personnel receive lentiviral-specific training from the lead investigator or other responsible party before working with lentiviruses.

Report any incidents or spills immediately to the lead investigator and EHS at 480-965-1823.

References:

1. U.S. Department of Health and Human Services (HHS) Centers for Disease Control and Prevention (CDC), and National Institutes of Health (NIH). *Biosafety in Microbiological and Biomedical Laboratories, Fifth Edition*. 2011. cdc.gov/biosafety/publications/bmbl5/index.htm.
2. Duane, Elizabeth Gilman. "A Practical Guide to Implementing a BSL-2+ Biosafety Program in a Research Laboratory." *Applied Biosafety*. Vol. 18. No. 1, 2013, pp. 30-36.
3. National Institutes of Health (NIH). "National Institutes of Health Recombinant DNA Advisory Committee (RAC) Guidance Document: Biosafety Considerations for Research with Lentiviral Vectors." 2006. osp.od.nih.gov/wp-content/uploads/Lenti_Containment_Guidance.pdf.
4. Oregon Health & Science University (OHSU), "Lentiviral Biosafety Manual." 2010. ohsu.edu/xd/about/services/integrity/policies/upload/IBC-EHRS-Form_Lentiviral-Vector-Safety-Manual.doc.