

This Standard Operating Procedure is issued jointly by the University of Michigan Office of Research and the Department of Environment, Health & Safety to provide guidance on the safe use and handling of adenovirus and adenoviral vectors.

## ADENOVIRUS/ADENOVIRAL VECTORS: STANDARD OPERATING PROCEDURE

### Containment Level

Adenoviral vectors may be contained at varying biosafety levels, dependent on the nature of the inserted genes and its replication competence. Generally, adenovirus is classified as a risk group 2 (RG2) organism.

### Approvals

Experiments using recombinant adenovirus require approval from the University of Michigan Institutional Biosafety Committee (IBC) before initiation of experiments.

### Precautions

1. Adenovirus is a pathogen of respiratory and gastrointestinal mucous and eye membranes, and does not have to be replication-competent to cause corneal and conjunctival damage. Goggles should be worn when working with the agent/vector.
2. The replication-defective virus may become complemented in vivo. Complementation may cause replication and spread of an otherwise replication-defective vector.
3. Adenovirus (unlike HIV), is relatively stable outside the host. After having been extracted with ether, and/or chloroform, it can still be infective.
4. Biohazard warning signs and labels must be used to indicate each area where adenovirus is used or stored (including Biosafety cabinets, incubators, refrigerators, laboratory entrance doors, etc.).

### Laboratory Practices

1. Personnel must have prior experience with adenovirus or must be provided with suitable and sufficient information, instruction and training on working with the agent prior to initiating work.
2. The room should be balanced negative in relation to surrounding spaces, including corridors
3. No work with Adenovirus is permitted on the open bench.
4. A certified biosafety cabinet must be used for all manipulations including (but not limited to):
  - a. pipetting
  - b. harvesting infected cells for RNA
  - c. loading and opening containers
5. Centrifugation must be done in closed containers and using sealed rotors.
6. All vacuum lines must be fitted with a HEPA filter (an example is the "Vacushield™" in-line hydrophobic filter, available through laboratory supply catalogs).

### Personnel Protective Equipment

1. Gloves (nitrile, latex, etc)

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2. Wrap around outer clothing when introducing vector into animals or performing necropsies. Lab coats are adequate for tissue culture manipulations.
3. Goggles (not to be confused with safety glasses)

### **Decontamination – \* Note - This is not to be performed for personnel exposure**

1. The most effective disinfectant (with a minimum 15 min. contact time) is a freshly prepared 10:1 dilution of sodium hypochlorite (bleach) solution (stock is 5% solution).
2. Autoclaving for 1 hour at 121°C or 250°F (15 lbs per square inch of steam pressure)

#### **Animal Use**

Concurrent approvals are needed from the Institutional Biosafety Committee (IBC) and the Institutional Animal Care & Use Committee (IACUC).

If animals are administered adenovirus intravenously, you must work under the assumption that animals may shed the recombinant adenovirus, and take appropriate precautions as described in this section.

1. Perform inoculations carefully to reduce the possibility of creating splashes or aerosols.
2. When animals are administered adenovirus/adenoviral vectors intravenously, an Animal Biosafety Level-2 (ABSL2) area must be approved and used for the housing of these animals for the first 72 hours after administration.
3. Infected animals may excrete adenovirus. Precautions must be taken not to create aerosols when emptying animal waste material and when washing down cages, or cleaning the room with pressure hoses. After this time, the animals must be changed to a clean cage and can then be moved to a standard animal housing facility.
4. Special training must be given to all animal husbandry personnel on adenovirus, the hazards associated with the work, required practices and procedures and proper handling of bedding, cage washing, and all other husbandry materials associated with the experiment.
5. Arrangements must be made with EHS for proper disposal of animal carcasses.

#### **Employee Exposure**

1. Eye Exposure from splash or aerosols - rinse a minimum of 15 minutes in eye wash or flush area with water and report the incident to your supervisor immediately after flushing. Follow up at the university's occupational medical provider, MWorks (998-8788). After hours refer employees to the UMHS Emergency Room.
2. Needlestick and/or Sharps Exposure – Contaminated skin should be thoroughly washed using soap and water for approximately 20 minutes. Report the incident to your supervisor immediately after washing. Seek medical attention at the university's occupational medical provider, MWorks (998-8788). After hours refer employees to UMHS Emergency Room.

#### **Symptoms**

Acute Respiratory Illness (cold-like symptoms); pneumonia. Conjunctival infection (or red eye), corneal inflammation leading up to scarification.