

St. Michael's

Inspired Care. Inspiring Science.

Title:	Adenoviral Guidelines		
Program or Department:	Research	Document Type:	PROCEDURE
Effective Date:	January 01,2015	Author	Steven Hayes
Next Review Date:	January 01,2016	Reviewing Body:	Research Biosafety Committee
Emergency Code:		Approving Body:	Research Biosafety Committee
Keywords:	Adenovirus,Adenoviral , Biosafety , Laboratory , Safety	Document Number:	0000001049

Introduction

Adenoviruses commonly cause respiratory illness but may also cause gastroenteritis, conjunctivitis, cystitis and rash illness depending on the infective serotype.

Adenovirus vectors are genetically engineered to insert a gene of interest into a eukaryotic cell where it is subsequently expressed. Adenoviruses are replication-defective; however, they may combine with naturally occurring viruses in humans or animals and regain the ability to replicate.

Adenoviral DNA does not integrate into the genome and is not replicated during cell division. This limits their use in basic research, although adenoviral vectors are occasionally used in *in vitro* experiments. Their primary application is in gene therapy and vaccinations

Associated Procedure

Mode of transmission of Adenovirus

- Direct contact with mucous membrane (eyes, nose and mouth)
- Inhalation of aerosols
- Penetration through skin (via needle puncture, scratches, cuts, animal bites or scratches etc.)
- Ingestion

Containment level

- ε Virus/vector work (not limited to: pipetting, harvesting infected cells for RNA, and loading and opening containers) must be conducted under a certified Biological Safety Cabinet (BSC) and using consistent biosafety containment level 2 practices as outlined by the Public Health Agency of Canada's (PHAC) Canadian Biosafety Standards and Guidelines (1st edition, 2013) within the cell culture room of each floor.
- ε No work with risk group 2 virus/vector or higher is permitted on the open bench.

Requirements

- Principal Investigator (PI) must have an active and approved Biosafety permit, issued by

the Research Biosafety Committee (RBC) before any work with Adenoviruses can commence

- Include the estimated duration of the project in order to properly allot the limited amount of cell culture space
- PIs and researchers must have up-to-date biosafety training, including safe work practices, storage and disposal. All cell culture room users must demonstrate proper cell culture room practices or must be trained by a RCF Coordinator. Access to the room will be provided after training. Contact the Research Facilities to activate your access card
- Where appropriate, a copy of the Standard Operating Procedure (SOP) for the experiment must also be present in the room
- PIs must inform their staff of any risks associated with working with a specific Adenovirus. Pregnant or immunocompromised workers should notify their PI before undertaking any work with any Adenoviruses

Personal Protective Equipment (PPE)

1. Gloves (double gloving is required)
2. Lab coat with purple collar
3. Lab appropriate clothing, including closed-toed shoes

- ⌘ Proper personal protective equipment must be worn at all times within the room.
- ⌘ Only put on the gloves once inside the room
- ⌘ Gloves should always be worn when handling cells, flasks, etc. used in the BSC and incubators
- ⌘ Gloves must be removed before exiting the cell culture room. If you need to pass between two adjacent rooms, remove one glove to open the door.

Work practices

Researchers working with adenoviruses must follow the general practices for handling infectious substances as outlined in the PHAC's Canadian Biosafety Standards and Guidelines (1st edition, 2013)

The following practices are also required;

- Verify that all the materials and equipment you are working with are in the lab and easily accessible
- Laboratory door must be closed with the biosafety sign posted on the door when work is in progress
- All work with the adenovirus must be done under a certified BSC. Proper techniques must be followed as outlined in the Biological Safety Cabinet Guidelines (found on the Intranet)
- Centrifugation must be done within the BSC. The centrifuge must be wiped and sprayed with accelerated hydrogen peroxide (Virox) or an appropriate disinfectant before removing it from the BSC
- Do not use sharps (needles, glass Pasteur pipettes) to harvest virus pellets. Use plastic aspiration pipettes when possible
- The Vacusafe vacuum system must be used for all aspiration within the BSC. Proper waste disposal of cell culture waste within the BSC must also be followed
- If cells are infected with adenovirus and are non-packaging cells, then they can be taken out of the cell culture room to harvest

Proper waste disposal and decontamination

- After working with the adenoviral vector, all BSC surface must be thoroughly disinfected
- Decontaminate all equipment used that has been in contact with the adenoviral vector with accelerated hydrogen peroxide (Virox).
- Sharps must be disposed in an approved sharps container. Container must be closed properly. Do not overfill the container.
- All biological waste from the cell culture room must be placed in a yellow biohazard bag or a yellow receptacle/sharps container for waste that may puncture. Do not let any pipettes stick out of the yellow receptacles. This can cause injury to others who may accidentally brush against them. Yellow receptacles should never be too full -- request for a new receptacle when it is two-thirds full. If you have liquid waste, place it in a tight sealed container and put it in the yellow biohazard bag or autoclave liquid waste and discard down the drain

Transport and Storage of Infectious Agent

- Follow the RBC Procedure for Transportation of Biohazardous Materials Quick Guide
- Adenoviruses must be stored in a 4 C fridge or -20 freezer, in labeled tubes or containers

Spill response

1. Alert the area occupants and evacuate the room for 30 minutes until all aerosols have settled before going back to clean the spill. Secure the area to avoid traffic
2. Put on all appropriate PPE (gloves, lab coat, goggles/face shield, mask) before entering affected area
3. Remove any sharps using forceps or scoop and place in a biohazard sharps container
4. Place paper towels or absorbent material around the spill and allow the spill to be absorbed. Use forceps to discard towels or absorbent material into a yellow biohazardous bag. Repeat until majority of the spill has been absorbed
5. Apply 10% Virox (Accelerated Hydrogen Peroxide) to the area of the spill and leave for 30 minutes
6. Clean the spill area with fresh paper towel. Repeat as necessary. Thoroughly wipe the area until dry
7. Clean the area with a hospital approved detergent. Ensure that that the area is thoroughly dry
8. Discard absorbent materials, respirator and gloves in the labeled yellow biohazard bag and tightly close the bag. Place the gown in an autoclavable bag and autoclave. Goggles and other reusable items should be soaked in a 1:10 dilution of bleach.
9. Wash hands thoroughly
10. Contact your PI and CHSS to inform them of the spill. Complete an event tracker

First Aid

1. In case of accidental splash or inoculation/mucosal absorption of substance potentially contaminated with adenoviral vectors, immediately wash the area with soap and running water for a minimum of 15 minutes. If eyes get potentially contaminated, immediately flush the eyes at an eyewash station for a minimum of 15 minutes
2. For accidental ingestion, please report to the Emergency Room
3. Report to Corporate Health and Safety for follow-up

4. Report the incident to your supervisor and fill out the online incident report (Event tracker on the Intranet).

Revision Number

Contact

This document is the property of St. Michael's Hospital. This material has been prepared solely for internal use. St. Michael's does not accept responsibility for the use of this material by any person or organization not associated with St. Michael's. No part of this document may be reproduced in any form for publication without permission from St. Michael's Hospital. Valid only on date printed: January/15/2015