

Biological Agent Reference Sheet (BARS)

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BIOLOGICAL AGENT REFERENCE SHEET

Adenovirus and Adenoviral Vectors

CHARACTERISTICS	
<i>Morphology</i>	Family <i>Adenoviridae</i> ; genus <i>Mastadenovirus</i> . The virus is non-enveloped with an icosahedral capsid at 70-90 nm in diameter and each contains a single linear, double-stranded DNA genome of approximately 36 kb. Adenovirus (AdV) vectors are viruses that have been engineered to carry exogenous DNA into host cells. The genetic modifications include removal of essential genes which renders the vector replication defective. AdV serotypes 2 and 5 are the most commonly used as vectors in vaccine development.
<i>Growth Conditions</i>	Human embryonic kidney (HEK) cell line or Human cervix carcinoma cells.

HEALTH HAZARDS	
<i>Host Range</i>	Humans and animals are susceptible hosts to wild-type AdV. The host range of AdV vectors will depend on the target gene and promoters engineered, thus a wide variety of dividing and non-dividing cells can be transformed.
<i>Modes of Transmission</i>	Respiratory and fecal-oral routes. AdV can also spread through contaminated fomites, ingestion, and inhalation of aerosolized droplets.
<i>Signs and Symptoms</i>	AdV infection causes a mild respiratory tract infection (resembling a common cold) which is self-limiting and generally asymptomatic. Infections may also affect the gastrointestinal tract, and eyes. Symptoms may include fever, nasal congestion, coryza, and pharyngitis. AdV and AdV vectors can induce varied immunological responses in the host, depending on the serotype.
<i>Infectious Dose</i>	Inhalation of as few as 5 Adenovirus particles can cause disease in susceptible individuals.
<i>Incubation Period</i>	Usually 2 to 14 days.

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	None available.
<i>Vaccines</i>	None available.
<i>Treatment</i>	Infection is generally self-limiting and treatment is supportive.
<i>Surveillance</i>	Monitor for symptoms. Laboratory confirmation is done via immunofluorescence, enzyme-linked immunoassay, or PCR.
<i>Emory Requirements</i>	Report all incidents.

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	At least 10 cases have been reported up to 2006 (serotypes were unknown).
<i>Sources</i>	Fecal samples, respiratory secretions, other tissues from an infected individual. Primary hazards include contact of mucous membranes (mouth or eyes), ingestion, inhalation of viral particles, and injection.

SUPPLEMENTAL REFERENCES	
<i>Canadian PHAC</i>	http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/msds3e-eng.php
<i>CDC</i>	https://www.cdc.gov/adenovirus/

CONTAINMENT	
<i>BSL2/ABSL2</i>	Containment Level 2 facilities, equipment, and operational practices. No open-bench work should be performed with AdV wild type or vectors. All work should be performed inside a Biosafety Cabinet. Use of needle-safe sharps is encouraged. Centrifuge rotors must have a lid, samples should be loaded/unloaded inside the BSC and the centrifuge should be decontaminated with appropriate disinfectant after use. If the vector is replication incompetent, animals infected with AdV vectors will remain at ABSL-2 for 72h, then moved to ABSL1. If the vector is replication competent, animals will be housed at ABSL2 for the length of the experiment.

SPILL PROCEDURES	
<i>Small</i>	Notify others working in the lab. Allow aerosols to settle. Don appropriate PPE. Cover area of the spill with paper towels and apply an EPA registered disinfectant effective against non-enveloped viruses, working from the perimeter towards the center. Allow 30 minutes of contact time before disposal and cleanup of spill materials.
<i>Large</i>	Contact Emory's Biosafety Officer (404-727-8863), the EHSO Office (404-727-5922), or The Spill Response Team (404-727-2888).

EXPOSURE PROCEDURES		
<i>Mucous membrane</i>	Flush eyes, mouth or nose for 15 minutes at eyewash station.	
<i>Other Exposure</i>	Wash area with soap and water for 15 minutes.	
<i>Reporting</i>	Immediately report incident to supervisor, complete an employee incident report in PeopleSoft.	
<i>Medical Follow up</i>	7am-4pm (OIM): EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)	After Hours: OIM NP On Call 404-686-5500 PIC# 50464
	Needle Stick (OIM): EUH (404-686-8587) EUHM (404-686-2352)	Yerkes: Maureen Thompson Office (404-727-8012) Cell (404-275-0963)

VIABILITY	
<i>Disinfection</i>	1-10% fresh bleach solution, a minimum of 10 min contact time is required. Alcohol is NOT an effective disinfectant against AdV.
<i>Inactivation</i>	AdV can be inactivated by heat (56 °C for 30 min, 60 °C for 2 min) and by autoclaving.
<i>Survival Outside Host</i>	AdV is very stable in the environment and persist for 7 days to 3 months on dry inanimate surfaces at room temperature.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
<i>Minimum PPE Requirements</i>	At minimum, personnel are required to don gloves, closed toed shoes, lab coat, and appropriate face and eye protection prior to working with Adenovirus. Additional PPE may be required depending on lab specific SOPs.
<i>Additional Precautions</i>	Use respiratory protection if work will be performed outside the biosafety cabinet. Additional precautions should be considered with work involving animals or large scale activities.