

## **Biological Agent Reference Sheet (BARS)**

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## BIOLOGICAL AGENT REFERENCE SHEET

### Variola Virus

CHARACTERISTICS	
<i>Morphology</i>	<b>Family:</b> Poxviridae; <b>Subfamily:</b> Chordopoxvirinae Genus: Orthopoxvirus. Virions are shaped like bricks on electron micrographs and measure approx. 300 x 250 x 200 nm. Orthopoxviruses have an outside envelope and a second membrane underneath. Instead of a capsid, poxviruses have a nucleosome which contains DNA, and is surrounded by its own membrane. They contain single, linear, double-stranded DNA molecules of 130 to 375 kb pairs and replicate in the cell cytoplasm.
<i>Growth Conditions</i>	Vero monkey kidney cells and a human fibroblast cell line (MRC5).

HEALTH HAZARDS	
<i>Host Range</i>	Humans and monkeys
<i>Modes of Transmission</i>	Transmission occurs via respiratory droplets (primary route of transmission), or via fine-particle aerosol, or skin inoculation. The conjunctiva or placenta may be occasional portals of entry. Respiratory droplets (i.e., coughing, sputum, and saliva) have a range of likely no more than 2 meters and are, therefore, a threat only to persons in the immediate vicinity of the affected patient
<i>Signs and Symptoms</i>	<u>Initial Symptoms</u> (Prodrome), ~2 to 4 days. Sometimes contagious: fever, malaise, head and body aches, and sometimes vomiting. <u>Early Rash:</u> ~ 4 days, first as small spots on the tongue and in the mouth. Most contagious <u>Pustular Rash:</u> ~ 5 days. Contagious <u>Pustules and Scabs:</u> ~ 5 days. Contagious <u>Resolving:</u> ~6 days, scabs. Contagious <u>Resolved:</u> Scabs have fallen off. Person is no longer contagious.
<i>Infectious Dose</i>	Viruses in an aerosol suspension can spread widely, and infect at a very low dose (10 to 100 organisms)
<i>Incubation Period</i>	Duration: 7 to 17 days Not contagious

MEDICAL PRECAUTIONS / TREATMENT	
<i>Prophylaxis</i>	None available.
<i>Vaccines</i>	Live vaccinia virus every 3 yr. Full protection occurs after successful vaccination. Vaccination at 4 to 7 days after exposure likely offers some protection from disease or may modify the severity of disease.
<i>Treatment</i>	None
<i>Surveillance</i>	Monitor for symptoms and confirm using PCR, electron microscopy and histology.
<i>Emory Requirements</i>	Report all incidents.

LABORATORY HAZARDS	
<i>Laboratory Acquired Infections (LAIs)</i>	Except for a laboratory-associated smallpox death at the University of Birmingham, England, in 1978, no further cases have been identified.
<i>Sources</i>	Lesion fluids or crusts, respiratory secretions and infected tissues containing the virus.

SUPPLEMENTAL REFERENCES	
<i>Canadian MSDS</i>	<a href="http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/variola-eng.php">http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/variola-eng.php</a>
<i>CDC</i>	<a href="http://www.bt.cdc.gov/agent/smallpox/">http://www.bt.cdc.gov/agent/smallpox/</a>

CONTAINMENT	
<i>BSL4/ABSL4</i>	Containment Level 4 facilities, equipment, and operational practices for work involving infectious or potentially infectious materials, animals, or cultures. <b>VARIOLA VIRUS RESEARCH IS NOT CONDUCTED AT EMORY UNIVERSITY</b>

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, 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>	<u>7am-4pm (OIM):</u> EUH (404-686-7941) EUHM (404-686-7106) WW (404-728-6431)	<u>After Hours:</u> OIM NP On Call 404-686-5500 PIC# 50464
	<u>Needle Stick (OIM):</u> EUH (404-686-8587) EUHM (404-686-2352)	<u>Yerkes:</u> Maureen Thompson Office (404-727-8012) Cell (404-275-0963)

VIABILITY	
<i>Disinfection</i>	70% Ethanol, sodium hypochlorite (1-10% dilution of fresh bleach). If using bleach within a biosafety cabinet, always follow up with a 70% ethanol rinse.
<i>Inactivation</i>	Can be inactivated by heat: autoclave cultures for 30 minutes at 121°C, 15 psi or by incineration.
<i>Survival Outside Host</i>	Materials from smallpox patients (dried fluid and crusts) containing virus remain infectious at room temperature for approximately 1 year.

PERSONAL PROTECTIVE EQUIPMENT (PPE)	
<i>Minimum PPE Requirements</i>	See PPE matrix developed for healthcare personnel attending potentially infectious or confirmed patients