Biological Agent Reference Sheet (BARS)

This content of this document is for Emory University USE ONLY.

The information and contents of this Biological Agent Reference Sheet (including all text and graphics), whether available in print or electronic format (including any digital format, e-mail transmissions, or download from the website), shall be known hereinafter as “Reference Sheet Content”. The Reference Sheet Content is provided as a courtesy and is not intended as a sole source of guidance in the evaluation of Biological Agents. The Reference Sheet Content is not intended to substitute for medical advice, medical care, diagnosis or treatment obtained from a physician or health care provider. Please seek the advice of a physician or other qualified health provider with any questions you may have regarding a medical condition. Do not rely on the Reference Sheet Content for diagnosis, treatment, or medical advice. This Reference Sheet Content is for informational purposes and does not provide individualized medical care or treatment. No endorsement of any specific tests, products, or procedures is made by Reference Sheet Content or affiliated party, member, agent or employee of the Emory University Environmental Health and Safety Office.
### Characteristics

**Family:** Poxviridae; **Subfamily:** 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.

**Growth Conditions**  
Vero monkey kidney cells and a human fibroblast cell line (MRC5).

### Health Hazards

**Host Range**  
Humans and monkeys

**Modes of Transmission**  
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, spitting, 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.

**Signs and Symptoms**  
Initial Symptoms (Prodrome): ~2 to 4 days. Sometimes contagious: fever, malaise, headache, and sometimes vomiting. Early Rash: ~4 days, first as small spots on the tongue and in the mouth. Most contagious Pustular Rash: ~5 days. Contagious Pustules and Scabs: ~5 days. Contagious Resolving: ~6 days, scabs. Contagious Resolved: Scabs have fallen off. Person is no longer contagious.

**Infectious Dose**  
Viruses in an aerosol suspension can spread widely, and infect at a very low dose (10 to 100 organisms).

**Incubation Period**  
Duration: 7 to 17 days  
Not contagious.

### Medical Precautions / Treatment

**Prophylaxis**  
None available.

**Vaccines**  
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.

**Treatment**  
None.

**Surveillance**  
Monitor for symptoms and confirm using PCR, electron microscopy and histology.

**Emory Requirements**  
Report all incidents.

### Laboratory Hazards

**Laboratory Acquired Infections (LAIs)**  
Except for a laboratory-associated smallpox death at the University of Birmingham, England, in 1978, no further cases have been identified.

**Sources**  
Lesion fluids or crusts, respiratory secretions and infected tissues containing the virus.

### Supplemental References


### Containment

- BSL4/ABSL4:  
  Containment Level 4 facilities, equipment, and operational practices for work involving infectious or potentially infectious materials, animals, or cultures.  
  **VARIOLA VIRUS RESEARCH IS NOT CONDUCTED AT EMORY UNIVERSITY**

### Spill Procedures

- Small:  
  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.

- Large:  
  Contact Emory’s Biosafety Officer (404-727-8863), the EHSO Office (404-727-5922), or The Spill Response Team (404-727-2888).

### Exposure Procedures

- **Mucous membrane:**  
  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.

### Viability

- **Disinfection:**  
  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.

- **Inactivation:**  
  Can be inactivated by heat: autoclave cultures for 30 minutes at 121°C, 15 psi or by incineration.

- **Survival Outside Host:**  
  Materials from smallpox patients (dried fluid and crusts) containing virus remain infectious at room temperature for approximately 1 year.

### Personal Protective Equipment (PPE)

- **Minimum PPE Requirements:**  
  See PPE matrix developed for healthcare personnel attending potentially infectious or confirmed patients.