## Biological Agent Reference Sheet (BARS)

**Agent: Measles Virus**

### Agent Characteristics

<table>
<thead>
<tr>
<th>Risk Group (RG)</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG-2</td>
<td>associated with human disease, rarely serious; preventive or therapeutic interventions often available</td>
<td>☒</td>
</tr>
<tr>
<td>RG-3</td>
<td>associated with serious or lethal human disease; preventive or therapeutic interventions may be available</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Agent Type

- **Virus Biohazard**

### Description

Measles virus (MeV) was originally isolated from the blood of a patient in Massachusetts, USA 1954. This isolate was further passaged on human embryonic kidney cells thus forming the Edmonston strain (MeV-Ed). MeV-Ed has been used to create highly attenuated, live measles vaccines. MeV-Ed has not been reported to cause illness in vaccinated, healthy individuals. However, wild-type (WT) Measles virus is highly contagious and can cause mild to severe disease in children and adults aged >20 years.

### Health Hazards of MeV-Ed

- **Signs and Symptoms:**
  - Flu-like symptoms (i.e. fever, headache, dehydration, weight loss, lethargy)
  - Cutaneous symptoms (i.e. skin lesions, rash)
  - Gastrointestinal symptoms (i.e. loss of appetite, nausea, vomiting, diarrhea)
  - Respiratory symptoms (i.e. coughing, sneezing)
  - Neurological symptoms (i.e. acute encephalitis; subacute sclerosing panencephalitis)
  - Musculoskeletal symptoms (i.e. joint and muscle pain)
  - Lymphoreticular symptoms (i.e. enlarged internal organs or lymph nodes)
  - Reproductive Health concerns (i.e. abortion, fetal abnormalities) – request a Reproductive Health Consultation

### Health Hazards of WT MeV

- **Signs and Symptoms:**
  - ● available
  - ○ not available
  - [https://www.cdc.gov/measles/hcp/index.html](https://www.cdc.gov/measles/hcp/index.html)

### Laboratory Hazards

- High energy-creating activities (centrifugation, sonication, high pressure systems, vortexing, tube cap popping)
- Handling of sharps (needles, scalpels, microtome blades, broken glass, etc.)
- Splash/droplet-creating activities (shaking incubators, liquid culturing, mechanical pipetting)
- Equipment contamination
- Exposed skin/uncovered wounds

### Laboratory Handling Guidelines

<table>
<thead>
<tr>
<th>Laboratory Bioafety Level (BSL)</th>
<th>Attended Strain Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ BSL-2 with special practices</td>
<td>Edmonston Strain (MeV-Ed)</td>
</tr>
</tbody>
</table>

### Laboratory Hazards

- 2% Paraformaldehyde; 60 minutes UV light

### Laboratory Acquisition

- None reported

### Waste Management

- Regulated Medical Waste (RMW)

### Shipping Guidance

- Refer to EHS Biological Materials Shipping

### Animal Vivarium Guidance

<table>
<thead>
<tr>
<th>Animal Housing Bioafety Level (ABS L)</th>
<th>ABS L-1</th>
<th>ABS L-2</th>
<th>ABS L-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal Biosecurity</td>
<td>○</td>
<td>☒</td>
<td>○</td>
</tr>
<tr>
<td>Perform Inoculations</td>
<td>Benchtop</td>
<td>Biosafety Cabinet</td>
<td></td>
</tr>
<tr>
<td>Change Cages</td>
<td>Benchtop</td>
<td>Biosafety Cabinet</td>
<td></td>
</tr>
</tbody>
</table>

### Agent Viability

| Disinfection                      | 1:10 Bleach Dilution | 70% Ethanol | Other: Povidone iodine; quaternary ammonia |

### Exposure and Spill Procedures

- Mucous Membranes: Flash eyes, mouth or nose for 15 minutes at eyewash station. See: responding to exposures.

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1. Based on NIH definitions. Final Risk Group (RG) designation will be assigned upon a case-by-case review by the Cornell University Institutional Biosafety Committee (IBC).

2. Formal medical advice is obtained during medical consultations with Cornell Health or primary healthcare provider as needed.

3. Final Biosafety Level designation will be assigned upon a case-by-case review by the Institutional Biosafety Committee.

4. Recommended in addition to closed toed shoes and long pants

5. BSL containment practices and waste management requirements are provided on the next page.
Vaccines &

Biosafety Level 2 Containment Requirements Summary

References


Other Exposures
Wash with soap and water for 15 minutes (open wounds, sores, etc.) and a minimum of 20 seconds of soap and water for areas with intact skin. See: responding to exposures.

Small Spills
Notify others working in the lab. Evacuate area and allow 30 minutes for aerosols to settle. Don appropriate PPE. Cover area of the spill with paper towels and apply disinfectant, working from the perimeter toward the center. Allow 30 minutes of contact time before disposal and cleanup of spill materials. See: spill cleanup.

Large Spills
Request assistance from the EHS Spill Team by calling CUPD dispatch. Call 911 from a campus phone or 607-255-1111 from a mobile phone.

Incident Reporting
Immediately report the incident to supervisor and complete the EHS online injury/illness report as soon as possible.

Medical Follow Up

<table>
<thead>
<tr>
<th>During Business Hours</th>
<th>After Hours Care</th>
<th>Emergencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornell Health 607-255-5155 (24-hour phone consultation line)</td>
<td>Cornell Health Services 24-hour phone consultation line or local urgent care as listed on above webpage.</td>
<td>Call 911 from a campus phone or 607-255-1111 from a mobile phone.</td>
</tr>
</tbody>
</table>

Biosafety Level 2 Containment Requirements Summary

Personal Hygiene
- Remove PPE before leaving the lab – avoid wearing PPE in public spaces.
- Wash hands frequently with soap and water after removing gloves, handling samples, leaving lab, etc.
- Change gloves frequently while working, and before removing samples from the biosafety cabinet to minimize potential contamination of equipment and surfaces within the lab.

Standard Microbiological Practices

In addition to standard BSL1 practices:
- Biohazard signs and labels on equipment.
- Use a biological safety cabinet (BSC), such as a Class II Type A2, for manipulations that can generate infectious aerosols.
- Use aerosol containing devices for high energy activities which may generate infectious aerosols. For example, centrifugation of agents which may generate infectious aerosols will use gasketed rotors or buckets. Rotors or buckets will be removed and opened inside a BSC. Centrifuge tubes will be filled and opened in a BSC.
- Vacuum lines are protected with liquid disinfectant-filled traps and 0.45 micron filters.
- Sharps handling and safety practices are implemented.
- Decontaminate work surfaces after completion of work and after any spill or splash of potentially infectious material with appropriate disinfectant.
- Chemically disinfect all surfaces and equipment.
- Potentially infectious materials are placed in durable, leak proof, labeled primary containers during collection, handling, processing, and secondary containers during storage, or transport within a facility.
- Windows in BSL-2 labs remain closed.

Special Practices

- All persons entering the laboratory are advised of the potential hazards and meet specific entry/exit requirements.
- The laboratory supervisor ensures that lab personnel demonstrate proficiency in standard and special microbiological practices before working with such agents.
- Laboratory equipment are routinely decontaminated, as well as, after spills, splashes or other potential contamination.
- Spills involving infectious materials are contained, decontaminated, and cleaned up by staff properly trained and equipped to work with infectious material.
- Equipment is decontaminated before repair, maintenance, or removal from the laboratory.

Regulated Medical Waste (RMW)

Soft waste:
- All materials that come into contact with this agent must be placed in a biohazard waste bag.
- If working in a BSC, have a biohazard waste bag inside the BSC for waste collection.
- Place smaller red bag waste from BSC into larger red bag outside the BSC for transport.

Sharps waste:
- Place in leak proof sharps container labeled with the biohazard symbol. If working in a BSC, place a sharps container in the BSC.

Liquid waste:
- Add EHS-approved disinfectant to appropriate concentration, hold for contact time specified per manufacturer’s guidelines, and then gently pour down the drain.

Special Considerations

Experiment-Specific Requirements

See lab protocols for additional information, any deviations from this BARS, and for lab-specific expectations.

References


Cornell EHS would like to thank Emory University for the use of their Biological Agent Reference Sheet (BARS) format and some content.

BARS-Measles Virus, Edmonston Effective 2/28/2017

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EHS/Biosafety Page 2