**Agent Characteristics**

<table>
<thead>
<tr>
<th>Risk Group (RG)</th>
<th>Description</th>
<th>Host Range</th>
<th>Host Shedding</th>
<th>Routes of Exposure to Humans</th>
<th>Infectious Dose</th>
<th>Incubation Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>RG-1 non associated with disease in healthy human adults</td>
<td>Gram-negative rod; motile, aerobic; does not contain toxin genes (stx1/stx2), often derivatives of either B or K strains. Examples include: E. coli K12, E. coli 25922, E. coli Nissle, E. coli Castellani and Chalmers ATCC 700728, and other E. coli strains approved by EHS Biosafety pending documented absence of shiga-toxin producing genes.</td>
<td>Humans, mammals, fish, and reptiles.</td>
<td>☐ Blood ☒ Saliva ☒ Direct contact ☒ Urine ☒ Feces ☒ Other:</td>
<td>☐ Aerosol/Inhalation ☒ Animal Bites ☒ Arthropod Vectors ☒ Contaminated Items ☒ Direct Contact ☒ Ingestion ☒ Mucous Membranes ☒ Inoculation (puncture) ☒ Vertical Transmission (pregnancy)</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*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).*

**Health Hazards**

**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. loss of sensation, ataxia)
- ☒ 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](#)
- ☒ Other: Attenuated strains of *E. coli* may pose a risk to immunocompromised individuals.

**Immunizations**
- ☒ Available ☒ Not Available

**Prophylaxis**
- ☐ Not applicable

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

**Agent Viability**

<table>
<thead>
<tr>
<th>Disinfection</th>
<th>Survival Outside Host</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒ 1:10 Bleach Dilution ☒ 70% Ethanol ☒ Other:</td>
<td>☒ Undetectable after 6 weeks in fecal material; undetectable after 2 months in soil. Survives well in foods: up to 50 min in butter; 10 days in cream; survives well in hamburger meat; does not survive long in slurry systems (innoculum of 10^8 cfu/mL became undetectable after 9 days).</td>
</tr>
</tbody>
</table>

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**Biological Agent Reference Sheet (BARS)**

**Agent: Non-Pathogenic *Escherichia coli***

**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 incubator, liquid cultures)
- ☒ Equipment contamination
- ☒ Exposed skin/uncovered wounds

**Laboratory Acquired Infection History**
- Four reported cases of laboratory infections with *E. coli* since 1981.

**Laboratory Handling Guidelines**

<table>
<thead>
<tr>
<th>Laboratory Biosafety Level (BSL)</th>
<th>Attenuated Strain Alternatives</th>
<th>Training</th>
<th>Lab Engineering Controls</th>
<th>Personal Protective Equipment (PPE)</th>
<th>Waste Management</th>
<th>Shipping Guidance</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒ BSL-1</td>
<td>☒ Not available.</td>
<td>☒ EHS Laboratory Safety Training (CULearn #2555)</td>
<td>☒ Benchtop</td>
<td>☒ Eye protection</td>
<td>☒ Landfill</td>
<td>☒ Regulated Medical Waste (RMW)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>☒ EHS Bloodborne Pathogens Training (CULearn #1070)</td>
<td>☒ Biosafety Cabinet</td>
<td>☒ Single gloves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>☒ Lab-specific protocol training</td>
<td>☒ Chemical Fume Hood</td>
<td>☒ Snap front lab coat with cinch cuffs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Animal Vivarium Guidance**

<table>
<thead>
<tr>
<th>Animal Housing Biosafety Level (ABSL)</th>
<th>Animal Biosecurity Concerns</th>
<th>Perform Inoculations</th>
<th>Change Cages</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒ ABSL-1 ☒ ABSL-2</td>
<td>☒ Yes, experimental animals are housed separately</td>
<td>☒ Benchtop ☒ Cage Changing Station</td>
<td>☒ Benchtop ☒ Cage Changing Station</td>
</tr>
<tr>
<td></td>
<td>☒ No</td>
<td>☒ Information not available</td>
<td></td>
</tr>
</tbody>
</table>

**Effective Date**
- Non-Pathogenic *E. coli* Effective 23 October 2017

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**EHS/Biosafety Page 1**
**Exposure and Spill Procedures**

<table>
<thead>
<tr>
<th>Mucous Membranes</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Exposures</td>
<td>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.</td>
</tr>
<tr>
<td>Small Spills</td>
<td>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.</td>
</tr>
<tr>
<td>Large Spills</td>
<td>Request assistance from the EHS Spill Team. Call 911 from a campus phone or 607-255-1111 from a mobile phone.</td>
</tr>
<tr>
<td>Incident Reporting</td>
<td>Immediately report the incident to supervisor and complete the EHS online injury/illness report as soon as possible.</td>
</tr>
</tbody>
</table>

**Medical Follow Up**

- **During Business Hours**: Cornell Health 607-255-5155 (24-hour phone consultation line)
- **After Hours Care**: Cornell Health 24-hour phone consultation line or local urgent care as listed on above webpage.
- **Emergencies**: Call 911 from a campus phone or 607-255-1111 from a mobile phone.

**Biosafety Level 1 Containment Requirements Summary**

**Personal Hygiene**
- Remove PPE and wash hands 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.

**Hygiene and Housekeeping**
- Keep work areas clean and uncluttered to reduce the chance for cross-contamination and inadvertent exposure to biohazards.
- To avoid ingestion of contaminated material, use a mechanical pipetting device, keep food out of refrigerators and microwaves in work areas, eat, drink, or apply cosmetics only in designated “clean” areas.
- Wear a lab coat and tie back long hair.
- Wear protective eyewear (marked ANSI Z87.1+ D3) during procedures in which splashes of microorganisms or other hazardous materials is anticipated.
- Wear the appropriate glove for the hazard. Usually a type of nitrile glove is recommended for working with biological material, check glove chemical compatibility chart.
- Avoid reusing disposable gloves.
- As required, wear eyewear or face shield approved for UV light (ANSI Z87.1 with UV certification) or other rays that could damage eyes. Contact Cornell EHS for a specific recommendation.
- Wear protective eyewear (marked ANSI Z87.1+ D3) during procedures in which splashes of microorganisms or other hazardous materials is anticipated.

**Special Considerations**

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

**References**

2. *E. coli* genotyping of host strains: [http://wiki.chem.virginia.edu/ColumbusLab/images/0/03/E_coli_host_strains_genotypes.pdf](http://wiki.chem.virginia.edu/ColumbusLab/images/0/03/E_coli_host_strains_genotypes.pdf)
4. FAQ for Experiments Exempt from the NIH Guidelines: [http://osp.od.nih.gov/sites/default/files/Experiments_that_are_Exempt_from_the_NIH_Guidelines.pdf](http://osp.od.nih.gov/sites/default/files/Experiments_that_are_Exempt_from_the_NIH_Guidelines.pdf)

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