

CHARACTERISTICS

Synonym or Cross Reference	Citrobacter amalonaticus, Citrobacter braakii, Citrobacter farmeri, Citrobacter freundii, Citrobacter koseri, Citrobacter sedlakii, Citrobacter werkmanii, Citrobacter Youngae, Ballerup group, Bethesda group, Bethesda-Ballerup group
Disease	Urinary tract infections, blood stream infections, intra abdominal sepsis, brain abscesses, and pneumonia and other neonatal infection Footnote 6, such as meningitis, neonatal sepsis, joint infection or general bacteremia
Morphology	Citrobacter spp., of the Enterobacteriaceae family, are gram-negative, facultative anaerobic bacteria that appear as rods or coccobacilli at 0.3-1 µm in diameter and 0.6-6 µm long
Zoonosis	None

RISK GROUP & CONTAINMENT REQUIREMENTS

ABSL-2	For all procedures utilizing infected animals.
BSL-2/BSL-2+	For all procedures involving suspected or known infectious specimen or cultures, work in a BSC unless otherwise approved and stated in lab-specific manual.
Risk Group 2	Agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available.

LABORATORY HAZARDS

Primary Hazards	Ingestion and accidental parenteral inoculation.
Sources	Samples described in IBC protocol. Human feces, brain abscesses, cerebral fluids, laboratory mice, eye, urine, intestines, umbilicus, skins pustules, hands, environmental sources (soil, water).
Lab Acquired Infections (LAIs)	None reported to date.

PERSONAL PROTECTIVE EQUIPMENT

Additional Precautions	Additional PPE may be required depending on lab-specific SOPs and IBC Protocol.
Minimum PPE Requirements	Lab coat, disposable gloves, safety glasses, closed toed shoes, long pants.

SPILL PROCEDURES

Large	Immediately notify all lab personnel and clear the area. Remove any contaminated PPE/clothing before exiting the lab. Lock all entry doors, post warning signage, and deny entry. Call DPS (213-740-4321) and ask to notify EH&S. Inform the PI and/or Lab Manager/Supervisor as soon as possible.
Small	Notify all lab personnel lab. Remove contaminated PPE and don new PPE. Cover spill area with absorbent material and add fresh 1:10 bleach:water. Allow 20 minutes (or as directed) contact time. After 20 minutes, clean up and dispose of materials.

VIABILITY

Disinfection	Use 10 % dilution of household bleach (minimum 0.3% sodium hypochlorite) for 20 to 30 minutes, or an acceptable time approved by IBC and EH&S.
Survival Outside Host	Survives well in water; can survive for a few hours on dry surfaces.

HEALTH HAZARDS

Host Range	Human and animals and aquatic organisms (catfish)
Incubation Period	In neonates disease can develop within a few hours of birth to 42 days after delivery
Infectious Dose	Approximately 10^7 CFU/mL
Modes of Transmission	Person-to-person transmission is more prevalent (e.g., direct contact with hospital staff members), mother to child transmission or through ingestion of environmental sources (fecal-oral route)
Signs and Symptoms	Burning sensation during urination, a more frequent urge to urinate, foul-smelling urine, blood in the urine. Other symptoms include high-grade fever, vomiting, seizures, and more.

EXPOSURE PROCEDURES

Medical Follow-up	Visit USC’s designated healthcare provider. Bring a copy of this PSDS.
Mucous Membrane	Flush eyes for 5-10 minutes at eyewash station.
Other Exposures	Immediately wash affected area with soap and water for 15 minutes.
Reporting	Immediately report incident to supervisor, notify EH&S, and complete Manager’s Report.

MEDICAL PRECAUTIONS/TREATMENT

Prophylaxis	Antibiotics such as amoxicillin and a beta-lactamase inhibitor
Surveillance	Monitor for symptoms of infection.
Treatment	Administer proper drug therapy. Eliminating predisposing factors such as administration of antibiotics, steroids, and immunosuppressants; humidity, local maceration, vaginal pH, removal of infected catheter can help in resolving infections
USC Requirements	Immediately report any exposures to Environmental Health & Safety.
Vaccines	None available

REFERENCES

BMBL http://tiny.cc/cdc-bmb1	Canadian PSDS http://tiny.cc/canada-aspergls-psds
CDC https://www.cdc.gov/	NIH Guidelines http://tiny.cc/ni-h-bio-secure
Virginia Tech http://tiny.cc/vt-psds	ScienceDirect http://tiny.cc/scidirect-citrobacter

