Listeria monocytogenes

Risk Group: *2*

Health Hazards

Listeria monocytogenes is a Gram positive bacterium and human pathogen that causes listeriosis. Listeriosis is a serious disease with symptoms ranging from a mild flu-like febrile illness, gastroenteritis, to the more severe inflammation of the central nervous system (meningitis). The case fatality rate for listeriosis is around 20%. *L. monocytogenes* is particularly severe for those in immune suppressed states, such as pregnant women, neonates, individuals with diabetes, and those receiving immunosuppressive drugs. Listeriosis can result in spontaneous abortion of fetuses and complications including death in neonates.

Laboratory hazards include accidental autoinoculation and exposures to contaminated or infected tissues and cultures. Great care must be undertaken when working with these materials.

Modes of Transmission

The most common mode of transmission is through ingestion of contaminated food or through direct contact with diseased farm animals or animal tissues during birthing or butchering processes. *L. monocytogenes* can also be transmitted from mother to fetus transplacentally, potentially leading to complications including spontaneous abortion.

Administrative Controls

- Biosafety level 2 facilities and practices must be in place.
- Access to the laboratory shall be restricted, doors must remain closed during experimentation
- Signs and labels incorporating the biohazard symbol must be posted at the entrance of the laboratory where the agent is being used and on any equipment that may be used to manipulate the agent.
- ALL laboratory personnel must be advised of the hazards of the agent
- ALL laboratory personnel must be trained in the proper handling, use and disposal prior to working with the agent
- Proper personal protective equipment (PPE) must be made available.
- All laboratory personnel must remove lab coats, discard gloves in the proper biological waste container and wash hands before exiting the lab.

- Work that may result in the creation of aerosols (any force imparted on a fluid) of contaminated liquids must be performed in a biological safety cabinet (BSC).
- To avoid accidental autoinoculation, the use of sharps should be limited only to circumstances when alternatives are not available. When sharps must be used, safer sharps practices must be exercised.

Engineering Controls

- All ***Listeria monocytogenes*** work must be performed in a BSL-2 laboratory and requires an annually **Certified Class II BSC.** If circumstances require an exception, contact the Biosafety Officer.

- **NO** open-bench work!
- **Biohazard Sharps Containers** shall be available to dispose of sharps waste, including broken glass, needles, blades, etc.
- **Centrifugation** must be performed in closed containers and using **sealed rotors or safety cups** to minimize the risk of aerosol generation. Samples must be placed into and/or removed from cups within a BSC.

- **Vacuum:** all vacuum lines must be **fitted with a HEPA filter** and a **vacuum flask**, containing the appropriate disinfectant in a volume sufficient to provide the recommended final concentration for that disinfectant when the flask is near full. At the end of the work session, aspirate a small volume of concentrated disinfectant through the vacuum tubing, into the vacuum flask. The vacuum flask must sit for a minimum time of 30 minutes prior to drain disposal.

- **Vortexing:** must be done in BSC.

- **Pipetting:** Aerosol resistant (filtered) tips must be used when pipetting.

- **Sharps (ONE-TIME USE):** All sharps should be immediately disposed of in to a sharps container (located within the BSC).

Personal Protective Equipment (PPE)

The following PPE must be worn at **ALL** times when handling ***Listeria monocytogenes***

Gloves

Lab coat

Safety goggles / glasses

Disinfection

A regular decontamination schedule of surfaces and equipment must be established.

- **Disinfectants:** 10% Sodium Hypochlorite (1:10 dilution 5.25% strength household bleach, such as Clorox)
- **Contact time:** 30 minutes before cleanup

Disposal

Liquid waste may be treated by autoclaving or with exposing to bleach (final concentration volume 10%) for 30 minutes or longer before disposing into the sink.

Solid biohazardous waste, such as culture vials, plates, plastic tubes, etc., are disposed of into an autoclave bag, autoclaved for 60 minutes at 121°C under 15lbs psi of steam pressure, sealed, and labeled, and placed in a biohazardous box-bag unit for pickup by EH&S.

Sharps waste, such as broken glass, pasteur pipets, razor blades, and needles, are disposed of into an approved biohazard sharps containers, autoclaved for 60 minutes, placed in a box-bag unit for pickup by EH&S.

Practices for Animal Injections

Great care must be taken when handling tissues and materials from experimentally infected animals. Procedures that may produce aerosols or involves high concentrations or large volumes of *L. monocytogenes* must be conducted in a biosafety cabinet when possible. Work with large animals will require added precautions as determined by the Institutional Animal Care and Use Committee (IACUC).

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Spills and Exposure Procedures

See pages 5-7 of the Laboratory Biosafety Manual

Medical Surveillance

All laboratory personnel must be advised by the PI on the health hazards of ***Listeria monocytogenes*** prior to starting work within the laboratory. Personnel must be made aware of the signs and symptoms of infection. In the event of an exposure or potential exposure, personnel must seek medical attention. The medical treatment provider may require continued self-monitoring of symptoms or further testing, such as serology.
Laboratory personnel must be aware of the symptoms of listeriosis and should monitor for them.

First Aid/Treatment

Medical treatment for listeriosis includes a course of antibiotics for 2 to 4 weeks.

Agent: *Listeria monocytogenes* Training Record

I have reviewed and understand the risks associated working with *Listeria monocytogenes*. I understand that my signature below indicates I agree to comply and work safely with the said agent.

Lab Personnel	Training Date	Signature