Tufts University / Tufts Medical Center

Exposure Response Plan for Laboratory Handling of *Salmonella typhimurium*

**Background information:** *Salmonella typhimurium* is a gram negative rod; motile, aerobic and facultative anaerobic. There are over 2000 serotypes capable of causing disease (acute gastroenteritis) Salmonellosis. Outside the lab disease usually results from foodborne infection/intoxication.

*Acute infectious disease* with sudden onset of abdominal pain, diarrhea, nausea and vomiting; dehydration may be severe in infants and elderly; deaths are uncommon except in very young or very old or debilitated/immunocompromised; morbidity may be high; may progress to more serious septicemia, includes focal infections, abscesses, endocarditis, pneumonia; may also cause typhoid like enteric fever; some cases develop reactive arthritis (Reiter's syndrome) which may become chronic.

*Exposure Incident:* There have been 48 reported laboratory infections with *Salmonella* spp. Source of infection includes contact with feces, blood, urine, food, feed and environmental materials. The exposure routes are ingestion and parenteral inoculation. The importance of aerosol exposure not known.

*Reporting Exposure Incidents:* Report all exposures to the Principal Investigator/Lab Supervisor and seek immediate medical evaluation. If help is needed with injuries or clean up, members of the University will contact the police at 6-6911 and members of the Medical Center will contact Security at 6-5100. Whenever there is an accident involving *S. typhimurium* the Biosafety Officer must be notified.

**Pre-exposure Health Screening:**

Employees must be given a copy of this information at the initiation of work in laboratories in which *Salmonella typhimurium* is present. Workers with concerns about pre-existing medical conditions should make an appointment with Occupational Health to discuss with physician. Immunization is not available at this time.

**Before an Exposure Incident Occurs:**

Immunization for *S. typhimurium* is not available at this time.

**After an exposure incident occurs: immediate action by route of exposure**

Mucous membranes (eye, mouth): If contaminated material is ingested or splashed, wash mouth out with water; do not swallow. Use emergency eyewash for eyes and a flush for 15 minutes.
Parenteral Inoculation: Wash the area with soap and running water. Do not apply bleach, alcohol or other disinfectant to the skin.

Inhalation: importance of aerosol exposure not known

Contact with intact skin and clothing: Remove contaminated clothing using gloves and place objects in autoclave bags. Clothing is autoclaved and then laundered. Wash skin with soap and water.

**After an Exposure Incident Occurs: Medical Evaluation and Follow-up:**

Following immediate actions, contact the TMC Employee Health Clinic (Boston), TCSVM Occupational Medical Clinic (Grafton) or the Mt. Auburn Occupational Health Services (Medford) and arrange for medical diagnosis and treatment.

If you develop diarrhea, fever and/or abdominal cramping within 12 to 72 hours following potential contact with the agent in the laboratory, assume that that you have salmonellosis.

Notify the Principal Investigator.

Notify your physician that you work with Salmonella and arrange for a stool specimen or anal swab to be taken. This specimen will be sent to the clinical laboratory and possibly the MDPH Laboratory to determine strain of Salmonella.

Speciation of non-typhoidal Salmonella species is performed at the Massachusetts State Lab with information available to the treating physician within 3-4 days

If non-typhoidal salmonella is identified, then the case will be reported to the Boston Public Health Commission as a laboratory-acquired disease.

If *S. typhimurium* infection is suspected or identified through laboratory procedures from laboratory workers, this will be treated as a potential failure of biosafety measures. The PI must be informed immediately. The PI must inform the Biosafety Officer within 72 hours of diagnosis. The BSO will complete a formal re-evaluation of laboratory safety procedures to determine the possible event that may have lead to this exposure.

**Signs and Symptoms of Salmonellosis:**

Symptoms of salmonellosis include diarrhea, fever, and abdominal cramps. They develop 12 to 72 hours after infection, and the illness usually lasts 4 to 7 days. Most people recover without treatment. But diarrhea and dehydration may be so severe that it is necessary to go to the hospital. Older adults, infants, and those with impaired immune systems are at highest risk.

If you only have diarrhea, you usually recover completely, although it may be several months before your bowel habits are entirely normal. A small number of people who are
infected with salmonellosis develop Reiter's syndrome, a disease that can last for months or years and can lead to chronic arthritis.

**Post-exposure Prophylaxis:**
There is currently no post exposure pre-symptom prophylaxis for salmonellosis. For entercolitis, rehydration and electrolyte therapy may be required. Hospitalization may be required in severe cases. For enteric fever or septicemia: antibiotic therapy is not often used. The Health Care Provider will verify current information and recommended diagnostic and treatment modalities.

Massachusetts Department of Public Health classifies salmonellosis as a reportable disease. In accordance with Massachusetts regulation, any clinical laboratory identifying an infection caused by *Salmonella* species may be reported to the Massachusetts Department of Public Health in accordance with disease-reporting regulations.

If an employee develops signs and symptoms associated with *Salmonella* exposure in the absence of an exposure incident and appropriate travel history, the PI and Biosafety Officer shall be notified immediately. The infection will be considered laboratory-acquired until proven otherwise.