

CHARACTERISTICS	
Synonym or Cross Reference	Salmonellosis. Serotype Typhi - Typhoid fever, Enteric fever, Typhus abdominalis. Serotype Choleraesuis - Salmonella septicaemia, hog cholera, hog typhoid, salmonellosis. Serotype Paratyphi - Enteric fever, Paratyphoid fever, Paratyphi type A, B, & C. Paratyphoid A, B, & C.
Disease	Can cause gastroenteritis, bacteremia, enteric fever, and an asymptomatic carrier state.
Morphology	2610 serotypes: Typhi, Paratyphi, Enteriditis, Typhimurium and Choleraesuis are well-known. 3 surface antigens: flagellar “H” antigen, oligosaccharide “O” antigen, and polysaccharide “Vi” antigen (Typhi and Paratyphi serotypes). Gram negative, motile, and non-sporing rod (0.7-1.5 by 2.0-5.0 µm) facultative anaerobes.
Zoonosis	Yes. Transmission between animals and humans occur when humans are in contact with infective animals and their feces.

RISK GROUP & CONTAINMENT REQUIREMENTS	
ABSL-2	For all procedures utilizing infected animals.
BSL-2/BSL-2+	Work in a BSC unless otherwise approved and stated in lab-specific manual. Raise containment level to BSL-2+ if oncogenic transgenes are used.
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	Salmonella enterica: Accidental parenteral inoculation and ingestion. The risk associated with aerosol exposure is not yet known.
Sources	Salmonella enterica found in blood, urine, feces, food and feed and environmental materials. Serotype Typhi found in blood, urine, feces, and bile.
Lab Acquired Infections (LAIs)	258 cases, 20 deaths due to typhoid fever; 48 cases of salmonellosis reported until 1976. 64 cases, 2 deaths due to Salmonella spp. infections reported 1979 - 2004, most of them associated with S. Typhi.

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	Unknown

HEALTH HAZARDS	
Host Range	Non-typhoidal salmonellosis: domestic and wild animals such as cattle, swine, poultry, wild birds, and pets (particularly reptiles) as well as flies. Salmonella Typhi: humans.
Incubation Period	Non-typhoidal salmonellosis: 5 to 72 hours; depends on inoculum size. Typhoid fever: 3 and 60 days, although most infections occur 7-14 days after contamination; depends on inoculum size, host susceptibility, and bacterial strain.
Infectious Dose	Varies with serotype. Non-typhoidal salmonellosis: ~ 103 bacilli. Enteric fever: ~ 105 bacilli by ingestion.
Modes of Transmission	Consuming contaminated food/water, contact with infected feces, contact with infective animals, animal feed, or humans. Higher risk foods: meat, poultry, milk products, and egg products.
Signs and Symptoms	Symptoms associated with gastroenteritis, bacteremia, enteric fever.

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 for at-risk individuals (e.g., neonates and the immunocompromised). Clean water supplies, sanitation, and treatment of carriers prevent spread of enteric fever in endemic areas.
Surveillance	Monitor for symptoms. Confirm diagnosis by serotyping from stool or blood.
Treatment	Bacteremia: Ciproflaxin, co-trimoxazole, ampicillin, or cephalosporins. Enteric fever: Chloramphenicol. Ampicillin, trimethoprim-sulfonamid, cephalosporins, ciproflaxin, and norflaxacin are also used. Gastrotenteritis: fluid and electrolyte replacement, control of nausea and vomiting.
USC Requirements	Immediately report any exposures to Environmental Health & Safety.
Vaccines	Three vaccines (2 parenteral and 1 oral) are currently available in the US for those working with serotype Typhi in a laboratory setting and for travellers who are going to spend extended periods of time in endemic areas. Currently, there is no vaccine to prevent non-typhoidal salmonellosis.

REFERENCES	
BMBL http://tiny.cc/cdc-bmb1	Canadian PSDS http://tiny.cc/canada-gov-psds
CDC https://www.cdc.gov/	Montana State U Biosafety Program http://tiny.cc/msu-psds
NIH Guidelines http://tiny.cc/nih-bio-secure	Virginia State U Biosafety Program http://tiny.cc/vt-psds

