PSDS
PATHOGEN SAFETY DATA SHEET

Staphylococcus aureus

CHARACTERISTICS

Synonym or Cross Reference	MRSA (methicillin-resistant Staphylococcus aureus), MSSA (methicillin-susceptive Staphylococcus aureus), VISA (vancomycin-intermediate Staphylococcus aureus), hVISA (heteroresistant vancomycin-intermediate Staphylococcus aureus), VRSA (vancomycin-resistant Staphylococcus aureus), staph infection, staphylococcus infection, impetigo, toxic shock syndrome.
Disease	Opportunistic pathogen that causes food poisoning, toxic shock syndrome (TSS), and necrotizing fasciitis (rare) in immunocompromised individuals. Scalded skin syndrome.
Morphology	Gram-positive, catalase positive cocci. ~0.5-1.5 µm in diam., nonmotile, non-spore-forming, facultative anaerobes (with exception of S. aureus anaerobius) that usually form in clusters. Many strains produce staphylococcal enterotoxins, the superantigen toxic shock syndrome toxin (TSST-1), and exfoliative toxins.
Zoonosis	Yes, through direct or indirect contact with an infected animal.

RISK GROUP & CONTAINMENT REQUIREMENTS

ABSL-2	For all procedures utilizing infected animals.
BSL-2/BSL-2+	Perform all procedures in a BSC unless otherwise approved and stated in lab-specific manual. Raise containment level to BSL-2+ if oncogenic trangenes 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	Trauma of cutaneous barrier, parenteral inoculation, direct implantation of medical devices (i.e. indwelling catheters and IVs), ingestion of infected material, and contact with aerosols. Direct contact with open cuts and lesions of skin.
Sources	Samples described in IBC protocol. Blood, abscesses, aerosols, faeces, and urine.
Lab Acquired Infections (LAIs)	29 reported cases up to 1973 with 1 death. Most common cause of laboratory infection was accidental self-exposure via the mucous membranes by touching contaminated hands to face or eyes.

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	Carcasses and organs (up to 42 days), floors (less than 7 days), glass (46 hours), sunlight (17 hours), UV (7 hours), meat products (60 days), coins (up to 7 days), skin (30 minutes to 38 days) (citation needed). Depending on colony size, S. aureus can survive on fabrics from days to months.

HEALTH HAZARDS

Host Range	Humans, wild and domestic animals, including cows
Incubation Period	Onset of symptoms after consuming contaminated food is usually 30 minutes to 8 hours.
Infectious Dose	Varies depending on the strain. At least 100,000 organisms in humans.
Modes of Transmission	Ingestion of food containing enterotoxins. Person-to-person transmission occurs through contact with a purulent lesion or with a carrier.
Signs and Symptoms	Rapid onset of nausea, vomiting, abdominal pain, cramps, and diarrhea. Animal bites can result in local infections, cellulitis, erythema, tenderness, mild fever, adenopathy, and lymphangitis (rarely). Signs of skin conditions include exfoliative toxins include blisters, skin loss, pimples, furuncles, impetigo, folliculitis, abscesses, poor temperature control, fluid loss, and secondary infection.

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	Elimination of nasal carriage by using topical mupirocin also eliminates hand carriage.
Surveillance	Monitor for signs of food poisoning when ingestion occurs and skin inflammation. Isolate organism from wound, blood, CSF, or urine. Toxic shock syndrome can be diagnosed clinically and isolation of S. aureus strain, TSST-1, or enterotoxins B or C; achieved using ELISA, reverse passive latex agglutination, or PCR. Scalded skin syndrome can be diagnosed clinically, with presence of Nikolsky's sign and identification of S. aureus retrieved from the infection site.
Treatment	Incision and drainage for localized skin infections; antibiotic therapy for severe infections; Many strains resistant to antibiotics; Sensitivity must be determined.
USC Requirements	Immediately report any exposures to Environmental Health & Safety.
Vaccines	None available

REFERENCES

BMBL
http://tiny.cc/cdc-bmbl

CDC
https://www.cdc.gov/

NIH Guidelines
http://tiny.cc/nih-bio-secure

Canadian PSDS
http://tiny.cc/canada-gov-psds

Montana State U Biosafety Program
http://tiny.cc/msu-psds

Virginia State U Biosafety Program
http://tiny.cc/vt-psds