Streptococcal sp.

Risk Group: *2*

Health Hazards

Streptococcal sp. are Gram positive bacteria within the Firmicutes phylum. There are numerous groups of *Streptococcal sp*. which are categorized using the Lancefield grouping system based on serotype classifications. Of medical importance, the most notable groups are A and B which include *S. pneumoniae, S. pyogenes, S. mutans* and *S. agalactiae*.

Streptococcal sp. are etiological agents that cause a wide variety of symptoms and diseases including pink eye, sore throat, scarlet fever, rheumatic fever, necrotizing fasciitis, impetigo, meningitis and pneumonia. Some infections result in permanent damage to tissues of the heart, central nervous system and joints.

Personnel must have knowledge of the specific *Streptococcal sp.* present in the lab.

Modes of Transmission

Streptococcal sp. are spread via respiratory droplets or exposure of the mucous membranes with contaminated objects. In a laboratory setting, *Streptococcal sp*. may be spread via inhalation of infectious aerosols, indirect contact of mucous membranes with contaminated surfaces or objects, direct contact with mucous from an infected person or accidental inoculation via sharps injury.

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.

- 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).
- All laboratory personnel must remove lab coats, discard gloves in the proper biological waste container and wash hands before exiting the lab.
- 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 ***Streptococcal sp.*** 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 ***Streptococcal sp.***

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 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 EHS.

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 EHS.

Practices of Animal Injections

Procedures that may produce aerosols, involves high concentrations or large volumes of *Streptococcal sp.* 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).

Spill and Exposure Procedures

See pages 5-7of the Laboratory Biosafety Manual

Medical Surveillance

All laboratory personnel must be advised by the PI on the health hazards of the ***Streptococcal sp.*** 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.

First Aid/Treatment

Antibiotic treatment with appropriate antibiotics for the particular *Streptococcus sp.* is necessary. Penicillin, macrolides, or lincosamides are effective against *S. pyogenes*. Special attention to the choice of antibiotics for *S. pneumoniae* must be taken into consideration as some antibiotics can enhance the harmful effects of the disease. Prophylaxis and immunizations for some *Streptococcal sp*. diseases are available and may be considered after consultation with a medical doctor.

Agent: *Streptococcal sp.* Training Record

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

Lab Personnel	Training Date	Signature