



APPENDIX C – Aerosol Transmissible Disease Program - Lab

Cal/OSHA's Aerosol Transmissible Diseases (ATD) Standard, in 8 CCR 5199, applies to laboratory operations when employees perform procedures capable of aerosolizing Airborne Transmissible Pathogens (ATPs-L).

- ◀ Organisms requiring BSL-3 controls
- ◀ Organisms specified in Appendix D of the ATD Standard.

At SFSU, laboratory operations are required to comply with subsections (a) and (f) of the ATD Standard, along with subsections (i) and (j) where Cal/OSHA's Respiratory Protection Standard (8 CCR 5199) is mentioned.

Laboratories in which employees have direct contact with cases or suspected cases of ATD or with potentially infected cadavers are required to comply with the full provisions of the ATD Standard.

Assessing Risk and Controls

The ATD requires that the institution's Biological Safety Officer performs risk assessments in accordance with methodology included in Section II of the BMBL for each agent covered by the Standard. For the purposes of ATD compliance, the campus biosafety programs coordinator serves as the Biological Safety Officer (BSO).

At SFSU, all uses of biohazardous materials must go through a biohazard use authorization process. The risk assessment is done by members of the University Biosafety Committee (BSC) in addition to the BSO.

At SFSU, use of biohazardous materials is limited to those requiring BSL-2 controls. BSL-3 and above are prohibited University owned or controlled properties or facilities. Because of this prohibition, Cal/OSHA's ATD Standard only covers those listed in Appendix D of that standard.

ATD Exposure Control/Biosafety Plan

The SFSU Biosafety Program Manual (aka Biosafety Plan in the ATD Standard) incorporates practices and procedures to minimize employee exposure to all biohazardous aerosols generated in laboratory operations, not just Aerosol Transmissible Pathogens (ATP-L).

- A. The person serving as the Biosafety Officer responsible for implementing the Biosafety Program is [Linda Vadura](#), EH&S, at 415.338.6892.



B. Job classifications in which all or some employees have occupational exposure:

Faculty researcher	Laboratory staff
Faculty instructor	Official Volunteer Employees
Student Employees	Technical Support or Operations Staff

Tasks and procedures in which employees have occupational exposure

- ◀ Preparing cultures and other materials for classroom use
- ◀ Handling and manipulating cells, bacteria, and culture for research use
- ◀ Pipetting, centrifuging, and sonicating biological materials for research use
- ◀ Handling and treating biohazardous waste
- ◀ Decontaminating and disinfecting surfaces and in contact with biohazardous material

C. ATPs-L known or reasonably expected to be present in laboratory materials (from Appendix D): *Salmonella* spp

Biosafety measures include using techniques to minimize the generation of aerosols and using a biosafety cabinet when using BSL-2 materials and BSL-2+ materials (BSL-2 controls plus ATD compliance).

- D. All materials containing ATPs-L will be treated as infectious material until verified that the pathogen has been deactivated or attenuated.
- E. Biosafety cabinets will be used to contain potentially infectious laboratory aerosols. When a biosafety cabinet cannot be used, centrifuges and other large equipment will be sealed or equipped with controls to prevent aerosols from escaping.
- F. Safe handling procedures have been established to minimize employee exposure to infectious agents. Sniffing in vitro cultures and other known unsafe practices are prohibited. Employees who work with biohazardous materials are required to complete an online course, "Working Safely with Biohazards" that reviews safe handling procedures.
- G. Effective decontamination and disinfection procedures are described in the Biosafety Program Manual and online training course, and further discussed by staff and faculty supervisors with their workers.
- H. Disposable gloves and lab coats are the minimum personal protective equipment required to work with biohazardous materials. Eye protection is required whenever a splash or aerosol hazard exists.
- I. Regular tasks and operations do not require respiratory protection. A NIOSH approved N95 respirator is an option when engineering controls, such as use of a biosafety cabinet, is not feasible. Use of respirators for non-routine tasks or operations that require respiratory protection as determined by the Biological Safety Officer, will comply with the



campus respirator program and 8 CCR 5199, Cal/OSHA Respiratory Protection Standard. If a more protective respirator is indicated, the work may not be done at SFSU.

- J. SFSU does not use BSL-3 materials. The *Salmonella* spp in use in SFSU laboratories will not result in uncontrolled releases of ATP-L requiring reporting to the local health officer.
- K. Medical services will be provided as needed for employees using organisms covered by the ATD Standard through a contracted licensed occupational medical services provider. All tests will be performed by an accredited laboratory.

Biohazardous materials or pathogens that may require employee medical surveillance or immunizations will be identified as part of the Biohazard Use Authorization process (as described in the Biosafety Program Manual).

There are no immunizations currently available for *Salmonella* spp. and no applicable public health guidelines for laboratory use.

Research and teaching activities at SFSU do not involve the use of materials containing *M. Tuberculosis* so surveillance for latent TB (LTB1) is not necessary or provided.

Appendix D of §5199: Aerosol Transmissible Pathogens – Laboratory (Mandatory)

Appendix D of the ATD Standard contains a list of agents that, when reasonably anticipated to be present, require a laboratory to comply with Section 5199 for laboratory operations by performing a risk assessment and establishing a biosafety plan that includes appropriate control measures as identified in the standard. Below is an excerpt from Appendix D. [ATD Standard Appendix D](#)

Adenovirus (in clinical specimens and in cultures or other materials derived from clinical specimens)

Arboviruses, unless identified individually elsewhere in this list (large quantities or high concentrations* of arboviruses for which CDC recommends BSL-2, e.g., dengue virus; potentially infectious clinical materials, infected tissue cultures, animals, or arthropods involving arboviruses for which CDC recommends BSL-3 or higher, e.g., Japanese encephalitis, West Nile virus, Yellow Fever)

Arenaviruses (large quantities or high concentrations of arenaviruses for which CDC recommends BSL-2, e.g., Pichinde virus; potentially infectious clinical materials, infected tissue cultures, animals, or arthropods involving arenaviruses for which CDC recommends BSL-3 or higher, e.g., Flexal virus)

Bacillus anthracis (activities with high potential for aerosol production**, large quantities or high concentrations, screening environmental samples from *b. anthracis* -contaminated locations)

Blastomyces dermatitidis (sporulating mold-form cultures, processing environmental materials known or likely to contain infectious conidia)

Bordetella pertussis (aerosol generation, or large quantities or high concentrations)



Brucella abortus, *B. canis*, *B. "maris"*, *B. melitensis*, *B. suis* (cultures, experimental animal studies, products of conception containing or believed to contain pathogenic *Brucella* spp.)

Burkholderia mallei, *B. pseudomallei* (potential for aerosol or droplet exposure, handling infected animals, large quantities or high concentrations)

Cercopithecine herpesvirus (see Herpesvirus simiae)

Chlamydia pneumoniae (activities with high potential for droplet or aerosol production, large quantities or high concentrations)

Chlamydia psittaci (activities with high potential for droplet or aerosol production, large quantities or high concentrations, non-avian strains, infected caged birds, necropsy of infected birds and diagnostic examination of tissues or cultures known to contain or be potentially infected with *C. psittaci* strains of avian origin)

Chlamydia trachomatis (activities with high potential for droplet or aerosol production, large quantities or high concentrations, cultures of lymphogranuloma venereum (LGV) serovars, specimens known or likely to contain *C. trachomatis*)

Clostridium botulinum (activities with high potential for aerosol or droplet production, large quantities or high concentrations)

Coccidioides immitis, *C. posadasii* (sporulating cultures, processing environmental materials known or likely to contain infectious arthroconidia, experimental animal studies involving exposure by the intranasal or pulmonary route)

Corynebacterium diphtheriae

Coxiella burnetti (inoculation, incubation, and harvesting of embryonated eggs or cell cultures; experimental animal studies, animal studies with infected arthropods, necropsy of infected animals, handling infected tissues)

Crimean-Congo haemorrhagic fever virus

Cytomegalovirus, human (viral production, purification, or concentration)

Eastern equine encephalomyelitis virus (EEEV) (clinical materials, infectious cultures, infected animals or arthropods)

Ebola virus

Epstein-Barr virus (viral production, purification, or concentration)

Escherichia coli, shiga toxin-producing only (aerosol generation or high splash potential)

Flexal virus

Francisella tularensis (suspect cultures—including preparatory work for automated identification systems, experimental animal studies, necropsy of infected animals, high concentrations of reduced-virulence strains)

Guanarito virus

Haemophilus influenzae, type b



Hantaviruses (serum or tissue from potentially infected rodents, potentially infected tissues, large quantities or high concentrations, cell cultures, experimental rodent studies)

Helicobacter pylori (homogenizing or vortexing gastric specimens)

Hemorrhagic fever -- specimens from cases thought to be due to dengue or yellow fever viruses or which originate from areas in which communicable hemorrhagic fever are reasonably anticipated to be present

Hendra virus

Hepatitis B, C, and D viruses (activities with high potential for droplet or aerosol generation, large quantities or high concentrations of infectious materials)

Herpes simplex virus 1 and 2

Herpesvirus simiae (B-virus) (consider for any material suspected to contain virus, mandatory for any material known to contain virus, propagation for diagnosis, cultures)

Histoplasma capsulatum (sporulating mold-form cultures, propagating environmental materials known or likely to contain infectious conidia)

Human herpesviruses 6A, 6B, 7, and 8 (viral production, purification, or concentration)

Influenza virus, non-contemporary human (H2N2) strains, 1918 influenza strain, highly pathogenic avian influenza (HPAI) (large animals infected with 1918 strain and animals infected with HPAI strains in ABSL-3 facilities, loose-housed animals infected with HPAI strains in BSL-3-Ag facilities)

Influenza virus, H5N1 - human, avian

Junin virus

Kyasanur forest disease virus

Lassa fever virus

Legionella pneumophila, other legionella-like agents (aerosol generation, large quantities or high concentrations)

Lymphocytic choriomeningitis virus (LCMV) (field isolates and clinical materials from human cases, activities with high potential for aerosol generation, large quantities or high concentrations, strains lethal to nonhuman primates, infected transplantable tumors, infected hamsters)

Machupo virus

Marburg virus

Measles virus

Monkeypox virus (experimentally or naturally infected animals)

Mumps virus

Mycobacterium tuberculosis complex (*M. africanum*, *M. bovis*, *M. caprae*, *M. microti*, *M. pinnipedii*, *M. tuberculosis*) (aerosol-generating activities with clinical specimens, cultures, experimental animal studies with infected nonhuman primates)



Mycobacteria spp. other than those in the *M. tuberculosis* complex and *M. leprae* (aerosol generation)

Mycoplasma pneumoniae

Neisseria gonorrhoeae (large quantities or high concentrations, consider for aerosol or droplet generation)

Neisseria meningitidis (activities with high potential for droplet or aerosol production, large quantities or high concentrations)

Nipah virus

Omsk hemorrhagic fever virus

Parvovirus B19

Prions (bovine spongiform encephalopathy prions, only when supported by a risk assessment)

Rabies virus, and related lyssaviruses (activities with high potential for droplet or aerosol production, large quantities or high concentrations)

Retroviruses, including Human and Simian Immunodeficiency viruses (HIV and SIV) (activities with high potential for aerosol or droplet production, large quantities or high concentrations)

Rickettsia prowazekii, *Orientia (Rickettsia) tsutsuagmushi*, *R. typhi (R. mooseri)*, Spotted Fever Group agents (*R. akari*, *R. australis*, *R. conorii*, *R. japonicum*, *R. rickettsii*, and *R. siberica*) (known or potentially infectious materials; inoculation, incubation, and harvesting of embryonated eggs or cell cultures; experimental animal studies with infected arthropods)

Rift valley fever virus (RVFV)

Rubella virus

Sabia virus

***Salmonella* spp. other than *S. typhi* (aerosol generation or high splash potential)**

Salmonella typhi (activities with significant potential for aerosol generation, large quantities)

SARS coronavirus (untreated specimens, cell cultures, experimental animal studies)

Shigella spp. (aerosol generation or high splash potential)

Streptococcus spp., group A

Tick-borne encephalitis viruses (Central European tick-borne encephalitis, Far Eastern tick-borne encephalitis, Russian spring and summer encephalitis)

Vaccinia virus

Varicella zoster virus

Variola major virus (Smallpox virus)

Variola minor virus (Alastrim)

Venezuelan equine encephalitis virus (VEEV) (clinical materials, infectious cultures, infected animals or arthropods)



West Nile virus (WNV) (dissection of field-collected dead birds, cultures, experimental animal and vector studies)

Western equine encephalitis virus (WEEV) (clinical materials, infectious cultures, infected animals or arthropods)

Yersinia pestis (antibiotic resistant strains, activities with high potential for droplet or aerosol production, large quantities or high concentrations, infected arthropods, potentially infected animals)

* 'Large quantities or high concentrations' refers to volumes or concentrations considerably in excess of those typically used for identification and typing activities. A risk assessment must be performed to determine if the quantity or concentration to be used carries an increased risk, and would therefore require aerosol control.

** 'activities with high potential for aerosol generation' include centrifugation