

AEROSOL TRANSMISSIBLE DISEASE BIOSAFETY PLAN

Principal Investigator: _____

Department: _____ Date: _____

I. EXPOSURE DETERMINATION:

A. The following organisms and viruses are covered. We recognize that there is a high degree of variability in infectivity of these organisms and viruses. Check the organism(s) or viruses used in your laboratory:

Adenovirus	Helicobacter pylori ⁴	Parvovirus B19
Arboviruses ¹	Hemorrhagic fever viruses ⁵	Prions ⁸
Arenaviruses ²	Hendra virus	Rabies virus ⁹
Bacillus anthracis ³	Hepatitis B Virus	Retroviruses ¹⁰
Blastomyces dermatitidis	Hepatitis C Virus	Rickettsia akari
Bordetella pertussis	Hepatitis D virus	Rickettsia australis
Brucella abortus	Herpes Simplex Virus 1	Rickettsia conorii
Brucella canis	Herpes Simplex Virus 2	Rickettsia japonicum
Brucella maris	Herpesvirus simiae (B-virus)	Rickettsia prowazekii
Brucella melitensis	Histoplasma capsulatum	Rickettsia rickettsii
Brucella suis	Human Herpesvirus 6A	Rickettsia siberica
Burkholderia mallei	Human Herpesvirus 6B	Rickettsia typhi
Burkholderia pseudomallei	Human Herpesvirus 7	Rickettsia tsutsugamushi
Chlamydia pneumoniae	Human Herpesvirus 8	Rift Valley fever virus
Chlamydia psittaci	Influenza Viruses ⁶	Rubella Virus
Chlamydia trachomatis	Junin virus	Sabia virus
Clostridium botulinum	Kyasanur forest disease virus	Salmonella species
Coccidioides immitis	Lassa fever virus	Salmonella typhi
Coccidioides posadasii	Legionella pneumophila	SARS coronavirus
Corynebacterium diphtheriae	Lymphocytic Choriomeningitis Virus	Shigella species
Coxiella burnetti	Machupo virus	Streptococcus species, group A
Crimean-Congo haemorrhagic fever virus	Marburg virus	Tick-borne encephalitis viruses ¹¹
Cytomegalovirus (human)	Measles Virus	Vaccinia Virus
Eastern equine encephalomyelitis virus	Monkeypox virus	Varicella-Zoster Virus
Ebola virus	Mumps Virus	Variola major (Smallpox virus)
Epstein-Barr virus	Mycobacterium tuberculosis complex ⁷	Variola minor (Alastrim)
Escherichia coli (shiga toxin producing)	Mycobacterium species	Venezuelan equine encephalitis virus
Flexal virus	Mycoplasma pneumoniae	West Nile Virus
Francisella tularensis	Neisseria gonorrhoeae	Western equine encephalitis virus
Guanarito virus	Neisseria meningitides	Yersinia pestis
Haemophilus influenzae	Nipah virus	
Hantaviruses	Omsk hemorrhagic fever virus	

B. Identify the personnel working with Aerosol Transmissible Disease pathogens (ATP):

Name(s)	Job Classification	ATP's Used

C. Identify the tasks and procedures and the mitigation measures used to reduce risk of exposure to aerosol transmissible disease pathogens:

Procedure	ATP's Used	Engineering Controls ¹¹	Personal Protective Equipment ¹²	Work Practice Controls
Animal Handling				
Centrifugation				
Dissections or necropsy				
Electroporation				
Flow Cytometry				
Handling infected organisms or tissues				
Homogenization				
Infection of animals by gavage				
Infection of animals by inhalation				
Injection				
Lyophilization				
Pipetting				
Pouring				
Pumping culture in closed system				
Sample collection				
Shaking culture				
Sharps use				
Sonication				
Streak plating				
Trapping or handling wild animals				
Trituration				
Vortexing				
Other (specify):				

II. METHODS OF COMPLIANCE:

- A. Engineering controls** shall be used to eliminate or minimize exposure. Consult the Biohazardous Use Authorization (BUA) section 11 for Exposure Control Plans for each agent to find the Engineering Controls required. Biological safety cabinets are typically required for open manipulations. Case by case exceptions may be allowed by the Institutional Biosafety Committee when supported by a risk assessment. In some cases where biosafety cabinets are not practical, respirators may be required. To reduce percutaneous exposures, researchers should consider the use of engineered sharps protection devices. In addition to these agent specific controls, standard laboratory features include, but are not limited to: eyewash station, self-closing doors, cleanable floors and walls (carpets and rugs are not permitted), non-porous furniture, and a hand washing sink.
- B. Personal Protective Equipment** shall be used to eliminate or minimize exposure after engineering controls are used. The minimum PPE required is laboratory coat, safety glasses and disposable gloves. Consult the Biohazardous Use Authorization (BUA) for Exposure Control Plans for each agent to find the Personal Protective Equipment required. A respirator may be required based on the risk assessment for the agent and the operations planned. The use of respirators requires medical clearance, training and fit testing. Contact the Occupational Health Nurse (858) 534-8225 to obtain medical clearance forms.
- C.** Overtly contaminated surfaces must be decontaminated as soon as feasible. **Disinfectants** used must have a current CAL-EPA registration for use as a disinfectant. Consult the Biohazardous Use Authorization (BUA) for Exposure Control Plans for each agent to find recommended disinfectants.
- D.** UCSD's Biohazard Use Authorization (BUA) system provides a **risk assessment (section 7)** and **exposure control plans (section 11)** for all infectious agents. The exposure control plans list the symptoms of disease, modes of transmission, and emergency procedures. All authorized users can access the BUA on which they are listed. This application fulfills the requirement for **communication of biological hazards**. Additionally, the BUA system emails users the ECP's as an attachment when the authorization is approved or renewed. BUA provides a recordkeeping function in the Reviews section. This section will be used to record information on the annual update of the individual Biosafety Plans.
- E.** All incoming materials containing ATPs-L are to be treated as containing the virulent or wild-type pathogen, until procedures have been conducted at the laboratory to verify that a pathogen has been deactivated or attenuated.
- F. Improvements** to the Biosafety Plan come as part of the Approval and Renewal process of the Biohazardous Use Authorization. Best management practices are incorporated into the Exposure Control Plans. Incidents involving exposure to ATP's are investigated by the Biosafety Division. This investigation may lead to improvements in operations. Employees are encouraged to refine their Biosafety Plan as new information, techniques and safety equipment become available.
- G. Training** is required at the time of initial assignment to tasks where occupational exposure may take place and annually thereafter, not to exceed 12 months from the previous training. When changes, such as introduction of new engineering or work practice controls, modification of tasks or procedures or institution of new tasks or procedures, affect the employee's occupational exposure or control measures. The additional training may be limited to addressing the new exposures or control measures.
- H. General Work Practice Controls**
1. Personnel **wash their hands** frequently while working with biohazardous agents, and immediately after removing gloves.
 2. **Sniffing or smelling** of cultures is strictly prohibited.
 3. **Mouth pipetting** or mouth suctioning is strictly prohibited.
 4. **Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses** are prohibited in work areas. Never put anything (pen, pencil, pipette, etc.) into your mouth while working in the laboratory.

5. **Food and drink are not stored** in refrigerators, freezers, shelves, cabinets, bench tops, ovens, or microwaves where aerosol transmissible disease pathogens are kept or may be present.
6. **Used needles and other sharps** are not sheared, bent, broken, recapped, or re-sheathed by hand. Used needles are not removed from disposable syringes. Contaminated sharps are placed immediately in a puncture-resistant and labeled sharps container.
7. **Leak-resistant containers** are used during the collection, handling, processing, storage, transport, or shipping of aerosol transmissible disease pathogens. The containers are appropriately labeled or color-coded and are closed prior to transport. If outside contamination could occur, the primary container is placed in a second container, which prevents leakage.
8. Engineering controls are examined and maintained on a regular schedule to ensure their effectiveness. Biological safety cabinets (BSC's) are checked for proper functioning each time they are used. The biosafety cabinet must be certified annually and the inspection record posted on the biosafety cabinet.
9. All equipment is examined prior to servicing or shipping and is decontaminated as necessary. Contact Environment, Health and Safety (EH&S) for clearance of all equipment used for handling, processing, or storage of aerosol transmissible pathogens.
10. Broken glassware is not picked up directly with the hands. It must be cleaned using mechanical means, such as a brush and dustpan, tongs, or forceps.
11. All regulated waste shall either be incinerated or decontaminated by a method such as autoclaving. Biomedical waste is handled according to the standards of good laboratory practice and the UCSD biohazardous and medical waste guidelines, which are in compliance with state law.
12. All personal protective equipment (PPE) must be inspected, cleaned, or replaced as needed in order to maintain its effectiveness. This will be done at no cost to laboratory personnel. At no time will workers be expected to take home any PPE, including lab coats, for laundering or cleaning.
13. Vacuum lines are protected with liquid disinfectant traps and HEPA filters. The filters must be routinely checked monthly, and maintained or replaced as necessary.
14. All uncontrolled releases are immediately contained and cleaned by properly trained staff. For any spills outside of the biosafety cabinet, contact EH&S at (858) 534-4357 or 911 from a La Jolla campus phone. Any uncontrolled releases or accidents that result in exposure are immediately reported to the principal investigator (PI) or his or her designee. An incident report must be completed per instructions at the following website <http://blink.ucsd.edu/safety/occupational/reporting.html>.

The following are Biosafety Level 3 practices and depending on the agent may be required when containment level is BSL-2+ or ABSL-2+:

1. All open manipulations involving potentially infectious materials must be conducted in a biological safety cabinet; no work with these materials shall be conducted on the open bench.
2. If laboratory coats or gowns do not have tight-fitting cuffs, sleeve covers or equivalent measures must be used to prevent bare skin exposure.
3. Respirators are used to minimize potential exposure when handling organisms or viruses outside the biosafety cabinet.

III. MEDICAL SERVICES, VACCINATION, POST-EXPOSURE EVALUATION AND FOLLOW-UP

The UCSD Center for Occupational Environmental Medicine (COEM) will provide appropriate required medical services.

A. **Vaccination** is available for the following ATP's:

Bordetella pertussis	Neisseria Meningitides
Corynebacterium diphtheriae	Rabies Virus
Hepatitis B Virus	Rubella Virus
Influenza Virus	Streptococcus pneumoniae
Measles Virus	Vaccinia Virus
Mumps Virus	Varicella-Zoster Virus

A healthcare professional will discuss the benefits and risks of the vaccination. The vaccine must be provided at no cost to the employee. The employee must sign a form to document their intention to either accept or decline the vaccination.

To receive your vaccination/consultation, contact the Center for Occupational & Environmental Medicine (COEM) to make an appointment:

- **COEM – Campus – (858)657-1600, 8899 University Center Lane, Suite 160, San Diego, CA 92122** ([PDF map](#))
Note: The Nobel Shuttle comes within about 2 blocks from the clinic - corner of Lebon and Nobel.
Monday–Friday, 8 a.m. – 4:30 p.m.
- **COEM – Hillcrest – (619)471-9210, 330 Lewis Street, Suite 100, San Diego, CA 92103** ([map](#))
Monday–Friday, 8 a.m. – 4:30 p.m.

B. **Annual tuberculosis (TB) medical screening** is provided to all employees with potential for occupational exposure in accordance with applicable public health guidelines. Employees identified with serology conversion will be referred to a health care provider knowledgeable about TB evaluation to conduct necessary diagnostic tests and determine appropriate treatment options, with the employee's consent. If the source of the infection can be identified, any available diagnostic testing results including drug susceptibility patterns relating to the source will be provided to the health care provider conducting the medical evaluation. The health care provider will be requested to determine if an employee is a TB case or suspected case, notify the employee and local health officer, consult with the local health officer, provide infection control recommendations related to employee activity in the workplace, make recommendations regarding precautionary removal due to suspect active disease and provide a written opinion as required by CAL/OSHA Aerosol Transmissible Pathogens Standard. TB conversions will be recorded in accordance with California Occupational Injury/Illness Recordkeeping requirements. TB conversions related to occupational exposure will be investigated to determine the circumstances of the conversion, and correct any deficiencies found during the investigation. The investigation will be documented in accordance with the CAL/OSHA Aerosol Transmissible Pathogens Standard requirements.

C. An **exposure incident** is a significant exposure to an aerosol containing an ATD pathogen without the benefit of applicable exposure control measures required by the agent specific Exposure Control Plan. If this happens, you have the right to medical evaluation and treatment. Post-exposure services will be furnished to you at no cost in accordance with the Aerosol Transmissible Disease Standard. Prompt medical attention is important and may reduce the risk of serious health consequences after an exposure incident. The medical evaluation is confidential.

If you would like the medical evaluation to be provided by a health care provider other than the employer (UCSD), call Risk Management at (858) 822-2979 for campus-funded employees or (619) 543-7877 for UCSD Healthcare-funded employees.

IV. BIOSAFETY DIVISION

Campus biosafety officers review risk assessments in Biohazard Use Authorizations and construction plans for the renovation of laboratories using ATP's. Plans for new construction and renovation are routed first to the campus Fire Marshal. Plans involving laboratory space are then routed to the Research Safety Manager. Plans that involve tissue culture rooms are routed to the Biosafety Division for review. Campus Biosafety Officers/Specialists are:

Seth Mullen, Biosafety Officer
Environment, Health and Safety
University of California, San Diego
858-534-0353

Susan Mayo, Associate Biosafety Officer
Environment, Health and Safety
University of California, San Diego
858-534-5366

Sheryl Major, High Containment Officer
Environment, Health and Safety
University of California, San Diego
858-822-2493

For more information about the CAL/OSHA Aerosol Transmissible Pathogens Standard or for assistance in compliance, please contact your supervisor, your PI, or email EH&S Biosafety at ehsbio@ucsd.edu.

V. BIOLOGICAL SPILLS AND UNCONTROLLED RELEASES

The UC San Diego Emergency Guide is widely distributed in laboratory facilities and available online: <http://blink.ucsd.edu/safety/emergencies/preparedness/guide.html>.

If a spill is judged to be too large or dangerous for laboratory staff to safely clean up, the person on the scene will call for UCSD EH&S Spill Response at (858) 534-4357. The UCSD Police Dispatcher will alert the EH&S HazMat team. Team members on the HazMat team are medically cleared, trained and fit tested to wear self-contained breathing apparatus. Respiratory protection may be needed to clean up a spill or release of ATD pathogens.

An incident report must be completed per instructions <http://blink.ucsd.edu/safety/occupational/reporting.html>. Spills or uncontrolled releases of ATD pathogens outside of biosafety cabinets will be reported to the local health officer.

VI. LABORATORY AUDITS

Research Assistance Program specialists audit labs for safety and compliance twice per year. Audit results help researchers and Environment, Health & Safety (EH&S) identify and correct problems to maintain a safe work area and regulatory compliance.

Biosafety level 3 laboratories are audited by the Biosafety Division personnel annually.

The laboratory safety audit scoring system assigns 1, 4, or 16 points to violations, depending on severity. Points double for repeat violations.

The audit score is the total number of violation points. A laboratory with three 4-point violations would receive a score of 12 points. The goal for all laboratories is zero points.

Principal investigator (PI) must respond in writing within 10 working days of receiving an EH&S audit report, describing actions taken by the lab to correct violations noted during the inspection.

Footnotes to Aerosol Transmissible Pathogens (Section I, A, C):

- 1 Unless identified elsewhere on this list, large quantities or high concentrations of arboviruses which require BSL-2 containment (e.g. dengue virus); potentially infectious clinical materials, infected tissue cultures, animals, or arthropods involving arboviruses which require BSL-3 or higher containment (e.g. Japanese encephalitis)
- 2 Unless identified elsewhere on this list, large quantities or high concentrations of arenaviruses which require BSL-2 containment (e.g. Pichinde virus); potentially infectious clinical materials, infected tissue cultures, animals, or arthropods involving arenaviruses which require BSL-3 or higher containment (e.g. Flexal virus)
- 3 Activities with high potential for aerosol production, large quantities or high concentrations, screening environmental samples from b. anthracis contaminated locations. NOTE: attenuated strains are exempt but must be confirmed by independent testing.
- 4 This bacteria falls under the standard if procedures include homogenizing or vortexing gastric specimens.
- 5 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.
- 6 Non-contemporary human (H2N2) strains, 1918 influenza strain, highly pathogenic avian influenza (HPAI). This would also include large animals infected with either 1918 strain or HPAI strains in ABSL-3 facilities, and loose-housed animals infected with HPAI strains in BSL-3-Ag facilities.
- 7 This would include *Mycobacterium africanum*, *M. bovis*, *M. caprae*, *M. microti*, *M. pinnipedii*, and *M. tuberculosis*. Also included are aerosol generating activities with clinical specimens, all culturing, and experimental animal studies with infected non-human primates.
- 8 Bovine spongiform encephalopathy prions, only when supported by a risk assessment.
- 9 This includes rabies related lyssaviruses (Australian bat lyssavirus, Duvenhage virus, European bat lyssavirus, Lagos bat virus, Mokola virus).
- 10 This includes Human Immunodeficiency Virus and Simian Immunodeficiency Virus which are used in activities which have a high potential for aerosol or droplet production, large quantities, or high concentrations.
- 11 This includes Central European tick-borne encephalitis, Far Eastern tick-borne encephalitis, Russian spring and summer encephalitis.
- 12 Engineering controls include autoclaves, biosafety cabinets, closed centrifuge rotors, centrifuge safety cups, engineered sharps protection devices, sharps containers, and biosafety level (BSL) 2 facilities.
- 13 You may write BSL-2 to indicate laboratory coat, safety glasses and disposable examination gloves.

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