

Exposure Response Plan for the Laboratories Handling *Pseudomonas*

Background Information *Pseudomonas*

Pseudomonas spp are gram-negative, aerobic bacteria that are non-spore forming, rod-shaped and motile by polar flagella. They are free-living bacteria, commonly found in soil and water. *Pseudomonas* spp includes species with both clinical and environmental implications. Important members of this genus include: *P. aeruginosa*, *P. fluorescens*, and *P. stutzeri*. *P. aeruginosa* is found on the skin of some healthy persons and has been isolated from the throat and stool of non-hospitalized persons. *P. aeruginosa* is one of the most common bacterial causes of health care–acquired infections. According to the CDC, the overall incidence of *P. aeruginosa* infections in U.S. hospitals averages about 0.4 % (4 per 1000 discharges.). *P. aeruginosa* is an opportunistic human pathogen. It is the cause of ear infections, especially in children, and of generalized skin rashes following exposure to inadequately chlorinated hot tubs or swimming pools. Eye infections have occasionally been reported in persons using extended-wear contact lenses. Serious *P. aeruginosa* infections usually occur in hospitalized patients and/or persons with weakened immune systems, particularly those with cystic fibrosis, extensive burns, cancer, or AIDS. Major virulence factors for *P. aeruginosa* are: adhesins, flagella, toxins, capsule, slime layers, protease enzymes and biofilm formation.

Host range: *Pseudomonas* spp infect humans, animals and plants.

Infectious dose: Unknown.

Diseases caused by *P. aeruginosa*: Urinary tract infections, respiratory system infections, dermatitis, soft tissue infections, bacteremia, bone and joint infections, gastrointestinal infections and meningitis.

Signs and Symptoms of *P. aeruginosa*: Vary according to infection site.

Modes of transmission:

Direct contact by inhalation of aerosols, aspiration of contaminated water (tap or distilled) and by exposure of wounds to contaminated materials. Indirectly by contact of mucous membranes with discharges from infected conjunctivae or infected respiratory secretions. *Pseudomonas* can be spread on the hands of healthcare workers or by equipment that is not properly cleaned after contamination.

Containment requirements: BSL2 for all activities involving suspected or known infectious specimens or cultures of *P. aeruginosa*. Major hazards in the laboratory are accidental parenteral inoculation, inhalation of infectious aerosols, accidental ingestion, or direct skin contact.

Exposure Incidents:

Laboratory acquired infections (LAI) have not been reported. However, this is an opportunistic pathogen and there is the possibility of severe to fatal infection in the immunocompromised.

Reporting Exposure Incidents:

Report all exposures to the Principal Investigator or lab supervisor and seek immediate medical evaluation. Whenever there is an accident involving *Pseudomonas* spp, the Biosafety Officer must be notified. Following the exposure and immediate actions stated above, faculty and staff should contact the Corvallis Clinic during business hours at 541-753-1785 or 1-866-209-7711 after business hours. Arrange for medical evaluation, diagnosis and treatment if needed. Student workers should be evaluated at Student Health Services as soon as possible by the Occupational Health Physician and contact OSU Occupational Medicine at 541-737-7566.

Pre-exposure Health Screening:

Prior to beginning work with *Pseudomonas* spp, the PI or an Employee Health Professional will inform each person of the risks s/he takes and of the symptoms s/he may experience following exposure. Individuals with compromised immune systems, diabetes, cancer are at higher risk of infection by *Pseudomonas* spp. and therefore it is recommended that these individuals self-identify with the Occupational Health Provider.

Before an Exposure Incident Occurs: A vaccine is not available yet.

After an Exposure Incident Occurs:**Immediate Action by Route of Exposure**

- Inhalation: If contaminated materials are aerosolized outside of primary containment and potentially inhaled, rinse mouth twice with clean water expelling the rinsate. Do not swallow.
- Needlestick, laceration or Animal Bite: Wash the area with soap and running water for at least 15 min. Do not apply bleach, alcohol or other disinfectant to the skin.
- Mucous membranes (eye, nose, mouth): If contaminated material is splashed or sprayed contaminating the eyes, nose or mouth: Flush the eyes for 10-15 minutes. Rinse mouth out with clean water and do not swallow.

Medical evaluation and follow-up: Following the exposure and immediate actions stated above, faculty and staff should contact the Corvallis Clinic during business hours at 541-753-1785 or 1-866-209-7711 after business hours. Arrange for medical evaluation, diagnosis and treatment if needed. Student workers should be evaluated at Student Health Services as soon as possible by the Occupational Health Physician and contact OSU Occupational Medicine at 541-737-7566.

Post-exposure prophylaxis: The healthcare provider will determine the course of treatment. *Pseudomonas* infections are generally treated with antibiotics. Note that *P. aeruginosa* is frequently resistant to many commonly used antibiotics. If an employee develops signs and symptoms associated

with *Pseudomonas* spp in the absence of an exposure incident, the PI and Biosafety Officer shall be notified immediately. Infection will not be considered laboratory-acquired until proven otherwise.