



INTRODUCTION TO BIOSAFETY

Program of Requirements

Biosafety Curriculum for Undergraduate and Graduate Students

Example POR (emphasis on “Example”; i.e. almost any aspect of this could change and it would still be a valid POR)

1. Program Overview

- a. The mission of Scientific Research Institute is to perform research on diseases affecting human and animal health which may lead to effective therapeutics, cures, or preventative measures.
 - i. This specific project will support the vaccine development team currently working to pilot a vaccine against Crimean-Congo Hemorrhagic Fever Virus (CCHFV) using a newly developed animal model utilizing humanized mice.
 - ii. A *Mycobacterium tuberculosis* research group at the institution would also like to be able to use the space for aerosol infections of their new mouse model of Tuberculosis.
- b. This construction project will develop the following spaces inside an already constructed facility (The Jenner-Einstein Research Complex) located at the Research Rectangle Parkway in Anytown, USA:
 - i. A combination A/BSL-3 with at least 2,500 ft² of functional work space
 1. supporting at least 4 workers operating simultaneously
 2. supporting at least 1 microisolator rack of purpose-bred research animals (mice or rats)
 - ii. A BSL-2 in support of the BSL-3 with at least 5,000 ft² of functional work space:
 1. supporting at least 6 workers operating simultaneously
 2. Supporting at least 2 microisolator racks of purpose-bred research animals (mice or rats)

2. Project specifications

- a. The high containment facility should be compliant with the BMBL, 5th edition.
 - i. It should have the following architectural features:
 1. an anteroom with sufficient space for PPE - PAPRs expected to be the PPE most commonly worn in the facility
 2. seamless walls, floors, and ceilings - surfaces should be an epoxy coat, vaporized hydrogen peroxide expected to be the gas decontamination agent used in facility
 3. integral coved floors
 4. non-absorbent (i.e. plastic or stainless steel) casework
 5. hands-free sink with an eyewash attachment
 - ii. It should have the following mechanical features:
 1. access to an autoclave large enough to accept the animal racks when necessary (pass-through autoclave is preferable) (brand and model no.)
 2. redundant supply and exhaust fans (n+1) with controls and airflow

3. airflow monitored and by differential pressure readings and controlled through mechanical controllers via the Building Automation System
- iii. It should have the following electrical features:
 1. HVAC and fire strobe and audible alarms
 2. Public Address (PA) system
 3. Hands-free telephones
 4. Data connections for the campus intranet
 5. Differential pressure monitors at each doorway
- iv. It should have the following equipment:
 1. at least 4 biosafety cabinets (brand and model no's)
 2. at least 1 microisolator rack with integral HEPA filters and water supply system (brand and model no.)
 3. at least 1 cage changing station (brand and model no.)
 4. a Glascol full body infection chamber (model no.)
 5. at least 1 stack incubator with access to dedicated CO₂ per BSC (4 total) (brand and model no.)
 6. at least 1 shaking incubator per BSC (4 total)
 7. at least 2 -80C freezers (brand and model no.)
 8. at least 1 -20C freezer (brand and model no.)
 9. at least 1 4C refrigerator (brand and model no.)
 10. at least 1 confocal microscope (brand and model no.)
- b. The low containment facility should also be compliant with the BMBL5
 - i. It should have the following architectural features:
 1. chemically-resistant, phenolic-resin topped lab benches
 2. at least one BSC or dedicated Tissue Culture room for every 4 bays of bench space
 - ii. Equipment for the BSL-2 is already purchased and will be provided by the PI's. They include:
 1. Four -80C freezers
 2. Four -20C freezers
 3. Four 4C refrigerators
 4. Several stir plates
 5. Two microwaves (15 Amp)
 6. Two gel imaging stations
 7. Equipment for three gel preparation and running stations
 8. Equipment for two PCR stations
 9. An HPLC machine
 10. A flow cytometer (not for use with infectious substances)
 11. Two benchtop autoclaves for sterilizing surgical equipment and media