

CSD BIOHAZARD and BIOSAFETY PROGRAM rev 2

Purpose and Scope

As part of its goal to provide a safe and healthful workplace, the Chemical Sciences Division (CSD) is implementing this procedure related to the hazards associated with the use, handling and storage of biological materials. This procedure applies to all CSD facilities, work locations, employees, affiliates, guests and visitors where biological materials are used and/or stored.

CSDs Bio-safety Commitments:

- CSD is committed to providing a safe workplace and healthy work environment for all its staff, affiliates, guests and visitors.
- The CSD Biosafety Program will be posted on the CSD website with all pertaining related information.
- CSD will adhere to all applicable regulations (i.e. OSHA, etc) and procedures in the most stringent way and follow all good practice guidelines developed in this field.
- CSD does not allow nor conduct any work with biomaterial that would require special bio-containment - this leaves level 1 biohazards which require BioSafety Level 1 facilities and procedures and only under strict adherence to the guidelines and procedures set forth here.
- No biological materials will be cultured at CSD, all material will be destroyed after use.
- Only minimum feasible quantities will be handled, only small amounts will be kept.
- Biomaterial will be kept in appropriate, tightly sealed containers.
- CSD has a designated Bio Safety Officer as long as Biomaterial is handled in the lab.
- CSD has a Biosafety Council as long as biomaterial is handled in more than program area.
- Any work with Biomaterial must undergo prior Bio-Safety Review, which will be documented.
- Prior to bringing any or any new biomaterial to CSD, full disclosure and risk analysis need to be provided to ASR - Area Safety Representative, DDD - Deputy Division Director, PL - Program Leads, CSD BSC – Bio Safety Council, informed consent required.
- Person handling and being exposed to Biomaterial must have current Biosafety Training.
- Prescribed PPE will be worn when handling bio-material or when working in space/lab where bio-material is handled.
- Labs must be properly labeled 'BIOHAZARD' with info re hazard.
- Activities must be confined as much as possible to flow hoods.
- Work is only permitted in 'Closed Systems'!!
- Flow Hoods need to be equipped with HEPA filter.

- Bio-samples and extra bio-material will be destroyed after use.
- All workspace will be thoroughly cleaned/decontaminated daily if and after biomaterial has been handled.
- The CSD Biosafety Program will be reviewed annually and submitted to SECO for review.

Specific Terminology

Biosafety officer – CSD member with appropriate training

BioSafety Council – delegates from each program area if more than one program area works with biomaterial

Bio-safety advisor, external – appropriately trained and credentialed microbiologist

Biosafety audits/reviews will be conducted annually

Biomaterial inventory will be kept current

Responsibilities

1. Lab/Division Director has the overall responsibility
2. CSD Division Director has delegated operational oversight to his Deputy Div. Dir. Eric Williams
3. Program Leads are responsible to keep BSC advised of any planned new activities, that all appropriate persons are trained, and when any change in hazards or risks can be foreseen or are actually occurring
4. Scientist is responsible that all provisions of the CSD BioSafety Program are implemented and adhered too.

BioSafety Council

ASR - ex officio

DDD - ex officio

CAP - Karl Froyd

ACCP – Joshua Schwarz

and Dr. Noah Fierer, Ecology and Evolutionary Biology Department, CU Boulder, external biosafety advisor. One of his research foci is microbial life in the atmosphere

A. Laboratory Practices

1. All personnel must wash their hands after they handle viable materials after removing gloves, and before leaving the laboratory.
2. Eating, drinking, handling contact lenses, and applying cosmetics is forbidden in the laboratory.

3. Mouth pipetting is prohibited and only mechanical pipetting devices are used.
4. All procedures are performed to minimize the creation of splashes or aerosols.
5. Work surfaces are decontaminated with disinfectant when work is completed at the end of the day and after any spill of viable material.
6. All contaminated material, stocks, glassware, plastic ware and other biologically contaminated waste are autoclaved or decontaminated with a suitable disinfectant.
7. Materials to be decontaminated outside of the laboratory are placed in a durable, leak-proof container and closed for transport from the laboratory.
8. Insect and rodent control procedures are in effect.

B. Personal Protective Equipment

1. Protective laboratory coats/aprons are worn while in the laboratory and left in the laboratory after use. These coats are never taken from the laboratory without prior autoclaving or disinfection.
2. Suitable disposable gloves (e.g., latex, nitrile, vinyl) must be worn.
3. Goggles are available and used when required.

C. Laboratory Facilities

1. The laboratory has a sink for hand washing.
2. The laboratory is designed so that it can be easily cleaned and decontaminated. (Carpets and rugs are not appropriate)
3. Bench tops are impervious to water and resistant to moderate heat, acids, alkalis, organic solvents and chemicals used to decontaminate the work surface.
4. The laboratory furniture is sturdy with surrounding spaces accessible for cleaning.
5. If the laboratory has windows that are open, they are fitted with fly screens.
6. Sharps are discarded in a puncture-resistant sharps disposal container.
7. A fire extinguisher and first aid supplies are easily accessible within the laboratory
8. An eyewash facility is easily accessible within the laboratory.

D. Training

All personnel, whether Federal staff, affiliates, guests or visitors need to be trained when handling or when present in lab where biomaterial is handled. Training will be provided by lab.

Resources:

CU Boulder, Department of Environmental Health and Safety
<http://www.colorado.edu/ehs/>
and references within

<http://www.colorado.edu/ehs/research/biological.html>
<http://www.cdc.gov/biosafety/>
<http://www.cdc.gov/biosafety/publications/bmb15/>
<http://oba.od.nih.gov/oba/>

Appendix:

Standard Practices and Training

The first principle of containment is strict adherence to good microbiological practices. Consequently, all personnel directly or indirectly involved in experiments using biomaterial shall receive adequate instruction. At a minimum, these instructions include training in aseptic techniques and in the biology of the organisms used in the experiments so that the potential biohazards can be understood and appreciated.

Any research group working with agents that are known or potential biohazards shall have an emergency plan that describes the procedures to be followed if an accident contaminates personnel or the environment. The Principal Investigator shall ensure that everyone in the laboratory is familiar with both the potential hazards of the work and the emergency plan.

Physical Containment Levels

The objective of physical containment is to confine organisms and to reduce the potential for exposure of the laboratory worker, persons outside of the laboratory, and the environment to such organisms. Physical containment is achieved through the use of laboratory practices, containment equipment, and special laboratory design. Emphasis is placed on primary means of physical containment that are provided by laboratory practices and containment equipment. Special laboratory design provides a secondary means of protection against the accidental release of organisms outside the laboratory or to the environment. Special laboratory design is used primarily in facilities in which experiments of moderate to high potential hazard are performed.

Combinations of laboratory practices, containment equipment, and special laboratory design can be made to achieve different levels of physical containment. There are four levels of physical containment, which are designated as BL1, BL2, BL3, and BL4. It should be emphasized that the descriptions and assignments of physical containment detailed below are based on existing approaches to containment of pathogenic organisms. The National Cancer Institute describes three levels for research on oncogenic viruses that roughly correspond to NIH BL2, BL3, and BL4 levels. Currently, CSD conducts research that requires BL1 physical containment only. Therefore, only the descriptions and assignments of physical containment for BL1 are detailed below.

It is recognized that several different combinations of laboratory practices, containment equipment, and special laboratory design may be appropriate for containment of specific research activities. The selection of alternative methods of primary containment is dependent, however, on the level of biological containment provided by the host-vector system used in the experiment. Consideration will be given to other combinations that achieve an equivalent level of containment.

Biosafety Level 1 (BL1)

BL1 Standard Microbiological Practices

Access to the laboratory is limited or restricted at the discretion of the Principal Investigator when experiments are in progress.

Work surfaces are decontaminated at least once a day and after work with infectious materials is finished, and after any spill of viable material is cleaned with disinfectants that are effective against the agents of concern.

All contaminated liquid or solid wastes are decontaminated before disposal in accordance with the UCB "[B_i_o_l_o_g_i_c_a_l_L_a_b_o_r_a_t_o_r_y_W_a_s_t_e_M_a_n_a_g_e_m_e_n_t-D_i_s_p_o_s_a_l_P_o_l_i_c_y_a_n_d_P_r_o_c_e_d_u_r_e](http://ehs.colorado.edu/Download/EHSBiowaste.pdf)".

<http://ehs.colorado.edu/Download/EHSBiowaste.pdf>

Mechanical pipetting devices are used; mouth pipetting is prohibited.

Policies for the safe handling of sharps are instituted. Needles should not be bent, sheared, replaced in the needle sheath or guard, or removed from the syringe following use. The needle and syringe should be promptly placed in a puncture-resistant container and decontaminated, preferably autoclaved, and in accordance with the UCB "[B_i_o_l_o_g_i_c_a_l_L_a_b_o_r_a_t_o_r_y_W_a_s_t_e_M_a_n_a_g_e_m_e_n_t-D_i_s_p_o_s_a_l_P_o_l_i_c_y_a_n_d_P_r_o_c_e_d_u_r_e](http://ehs.colorado.edu/Download/EHSBiowaste.pdf)". <http://ehs.colorado.edu/Download/EHSBiowaste.pdf>

Eating, drinking, smoking, and applying cosmetics are not permitted in the work area. Food may be stored in cabinets or refrigerators designated and used for this purpose only. According to Environmental Health and Safety (EH&S) Laboratory Guidelines, no preparation, storage or consumption of food or drink is permitted in the lab.

Persons must wash their hands:

- (i) after handling materials involving organisms containing rDNA molecules and animals
- (ii) before exiting the laboratory

All procedures are performed carefully to minimize the creation of splashes or aerosols.

In the interest of good personal hygiene, facilities (e.g., hand washing sink, shower, and changing room) and protective clothing (e.g., uniforms, laboratory coats) shall be provided that are appropriate for the risk of exposure to viable organisms.

A biohazard sign must be posted at the entrance to the laboratory whenever infectious agents are present. The sign must include the name of the agent(s) in use and the name and the phone number of the investigator. Please see last page of this document for an example of an appropriate biohazard notification sign.

BL1 Special Practices

Contaminated materials that are to be decontaminated at a site away from the laboratory are placed in a durable leak-proof container that is closed before being removed from the laboratory.

An insect and rodent control program is in effect.

BL1 Containment Equipment

Special containment equipment is generally not required for manipulations of agents assigned to BL1.

Gloves must be worn if the skin on the hands is broken or if a rash is present. Protective eyewear must be worn for conduct of procedures in which splashes of microorganisms or other hazardous materials is anticipated.

BL1 Laboratory Facilities

Laboratories should have doors for access control.

The laboratory is designed so that it can be easily cleaned. Carpets and rugs in laboratories are not appropriate.

Bench tops are impervious to water and resistant to acids, alkalis, organic solvents, and moderate heat.

Laboratory furniture is sturdy. Spaces between benches, cabinets, and equipment are accessible for cleaning.

Each laboratory contains a sink for hand washing. Foot, knee, or automatically operated sinks are recommended.

If the laboratory has windows that open, they are fitted with fly screens.