

### **Biosafety Basics**

Biohazardous materials are infectious agents or other biological materials that present a risk or potential risk to the health of humans, animals or the environment. ***The AMCF can image nearly all RG1/BSL1 and RG2/BSL2 samples. Simply let us know your sample specific details in advance of imaging so we can plan appropriately.***

### **Biohazardous Materials Include:**

- organisms and viruses infectious to humans, animals or plants (e.g. parasites, viruses, bacteria, fungi, prions, rickettsia) cultured human and animal cells
- certain types of recombinant and/or synthetic DNA
- biologically active agents that may cause disease in other living organisms or cause significant impact to the environment or community. (i.e. toxins, allergens, venoms)

## **SOP for imaging BSL2 (standard) live samples in AMCF\***

\* Most, if not all, standard (not plus) cells/samples are anticipated to be appropriately covered by the following SOP. Since BSL2 encompasses very diverse cells lines and pathogens, biosafety will be asked to review alignment with individual IBC protocols.

1. You MUST get approval to image BSL2 level samples BEFORE bringing them to the facility. Researchers must share relevant (safety) sections of their active IBC protocol. Approval must be provided before conducting BSL2 imaging studies in the AMCF.
2. Samples must be fully prepared in your laboratory before bringing them to the facility.
3. Culture dishes must be sealed with parafilm to minimize the risk of spills on the microscopes. Minimum essential media volumes should be used to reduce risk of spillage (i.e. 2ml for 35mm dish, 4ml for 60mm dish). The outside of the dish must be wiped with an appropriate disinfectant that is effective against the agent per IBC protocol.
4. Slides are not recommended. If completely necessary, slides should be sealed with coverslips and rubber cement. If nail polish is used, it must be COMPLETELY dry before imaging. Nail polish will damage an objective if it hardens on it.
4. Carry samples to the AMCF in a closed secondary container with absorbent materials in the bottom. Clean the outside of the container before bringing the AMCF. BSL2 signage must be placed in entryway to individual imaging rooms prior to starting imaging/upon entry with BSL2 samples. See below, blank templates are available upon request. Multiple dates may be entered onto the same form if other parameters have not changed.
5. Use gloves when moving the dish onto the stage. REMOVE gloves before touching the microscope or computer. Gloves may be placed in the biohazard container. Additional gloves are available in each imaging area.
6. After imaging, the samples must be removed from the microscope and the microscope stage should be wiped down with tissue soaked in 70% ethanol (or another disinfectant that is effective against the agent). Any spills must be cleaned immediately with an appropriate disinfectant that is effective against the agent and appropriate/non damaging to AMCF instrumentation. Contact the AMCF staff immediately if there is a spill.
7. All samples must be taken back to the researcher's lab for disposal. All waste, excluding gloves, must be returned to the researcher's laboratory for proper disposal.
8. Wash hands with soap when completed.

**Instrument:**

**Date Posted:**

# BSL-2



## BIOHAZARD

### Admittance to Authorized Personnel Only

**Biological Agent(s):**

**Special Procedures,  
Personal Protective  
Equipment (PPE)  
or Precautions for  
Entry/Exit:**

**During Imaging:** 1) Only designated researchers may enter the imaging area.  
2)

**After Imaging:** 1) Decontamination Procedure =

2) Spill Procedure =

Contacts 1) PI, 2) Authorized Researchers		Emergency Contacts	
Name	Campus Phone, email	Name	Campus Phone, email
1)	1)	1)	1)
2)	2)	2) Heather Jensen-Smith	2) 402-559-4673, heather.jensensmith@unmc.edu

**UNMC Polies and Procedures:**

[Policies & Procedures | IBC | University of Nebraska Medical Center \(unmc.edu\)](#)

[UNMC Biosafety Manual](#)

**Risk Group and Biosafety Level Basics:****Risk Group 1 Agents/ Biosafety Level 1: Minimum Safety Practices**

- *Lab access is limited to personnel approved to work on the project.*
- *Personnel remove gloves and wash hands after handling potentially hazardous materials and before leaving the lab.*
- *Eating, drinking, smoking, handling contact lenses, applying cosmetics, and storing food for human consumption is not permitted in laboratory areas.*
- *Mouth pipetting is prohibited; mechanical pipetting devices must be used.*
- *Policies for the safe handling of sharps, such as needles, scalpels, pipettes, and broken glassware must be developed and implemented.*
- *Safe handling of sharps: Careful management of needles and other sharps are of primary importance. Needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal.*
- *Safe handling of sharps: Used disposable needles and syringes must be carefully placed in conveniently located puncture-resistant containers used for sharps disposal.*
- *Safe handling of sharps: Non-disposable sharps must be placed in a hard walled container for transport to a processing area for decontamination, preferably by autoclaving.*
- *Safe handling of sharps: Broken glassware must not be handled directly. Instead, it must be removed using a brush and dustpan, tongs, or forceps. Plastic ware should be substituted for glassware whenever possible.*
- *Perform all procedures to minimize the creation of splashes and/or aerosols.*
- *Decontaminate work surfaces after completion of work and after any spill or splash of potentially infectious material with appropriate disinfectant.*
- *Decontaminate all cultures, stocks, and other potentially infectious materials before disposal using an effective method.*
- *Materials to be decontaminated outside of the immediate laboratory must be placed in a durable, leak proof container and secured for transport.*
- *Materials to be removed from the facility for decontamination must be packed in accordance with applicable local, state, and federal regulations.*
- *A sign incorporating the universal biohazard symbol must be posted at the entrance to the laboratory when infectious agents are present. The sign may include the name of the agent(s) in use, and the name and phone number of the laboratory supervisor or other responsible personnel. Agent information should be posted in accordance with the institutional policy.*
- *An effective integrated pest management program is required in the laboratory.*
- *The laboratory supervisor must ensure that laboratory personnel receive appropriate training regarding their duties and potential hazards, the necessary precautions to prevent exposures, and exposure evaluation procedures. Personnel must receive annual updates or additional training when procedural or policy changes occur.*
- *Minimum PPE (personal protective equipment): lab coats, gowns, or uniforms are recommended to prevent contamination of personal clothing. Protective clothing should not leave the laboratory and should be disposed of, or a method should be in place to launder reusable lab coats on site or contract with a company that will handle laboratory clothing.*
- *Minimum PPE (personal protective equipment): Gloves should be worn when working in the laboratory. Change gloves as needed and dispose of all gloves and wash hands before leaving the laboratory.*

- *Minimum PPE (personal protective equipment): Eye / face protection is required when there is a risk for splash or creation of aerosols. Personnel who wear contact lenses should also wear eye protection while working in the laboratory.*

**Risk Group 2 Agents/ Biosafety Level 2: Minimum Safety Practices**

- *Personnel will be provided medical surveillance, as appropriate, and offered available immunizations for agents that are present in the lab.*
- *A laboratory-specific biosafety manual must be prepared by the laboratory supervisor and adopted as policy. All personnel must be trained and the manual must be available at all times.*
- *Personnel must demonstrate proficiency in required microbiological practices before they are allowed to access/ work with RG2 agents.*
- *Potentially infectious materials must be placed in a durable, leak-proof container during collection, handling, processing, storage or transport within a facility. A lid that seals closed must be in place prior to storage or transport.*
- *Biosafety Cabinets should be used to work with RG 2 agents whenever possible.*
- *Laboratory equipment should be routinely decontaminated, as well as, after potential contamination and prior to being repaired, maintained or removed from the laboratory.*
- *Accidents, spills and other incidents must be reported to the laboratory manager and the IBC committee.*
- *Personal Protective Equipment (PPE) that is used in the laboratory must be disposed of or decontaminated before leaving the containment laboratory.*

**The keys to working safely with biohazardous materials are:**

- Discuss the RISK GROUP of your sample *prior* to imaging in the AMCF.
  - Risk groups (RGs) indicate specific hazards associated with particular bacteria, virus, or other biohazards. RGs are based on an agent's ability to infect and cause disease, severity of disease, and availability of preventative and effective treatments.
- Ensuring that Training Requirements have been met prior to beginning work with biohazardous materials
- Ensuring that any required equipment has been certified and is in proper working order
- Ensuring that any required PPE is available and that laboratory personnel are trained in its proper use and care
- Posting Biosafety Signs in appropriate locations throughout the lab and especially at any entrance to the lab
- Understanding what Risk Groups and Biosafety Levels are and the differences between them