**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)

**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 it's 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

**UNMC Polies and Procedures:**

[Policies & Procedures | IBC | University of Nebraska Medical Center (unmc.edu)](https://www.unmc.edu/ibc/policies-procedures/index.html)

**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 PLUS***

* *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.*