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Laboratory Self-Inspection Cheat Sheet

PURPOSE: This document serves as supplementary information to the existing Laboratory Self-Inspection Form. This document does not need to be read or printed in its entirety. This document serves as a reference tool for Laboratory Self-Inspections. For each inspection item, EHSO has provided the safety reason, how the lab can comply, and the regulatory source of the item. Links are provided to specific forms, pages, manuals, etc. Please contact EHSO (404-727-5922) if you have further questions or notice any broken links.

This is a long document. We **do not** recommend printing it.

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MANUALS, GUIDELINES AND REGULATORY SOURCE LINKS

Institutional document links can be found on the **EHSO website**:

- Manuals
  - SAF-310, Biosafety Manual
  - SAF-311, Bloodborne Pathogens Exposure Control Plan
  - SAF-351, Chemical Hygiene Plan
  - SAF-367, Laser Safety Program
  - RAD-030, Radiation Safety Manual
  - SAF-362, Electrical Safety Program
- Guidelines
  - Guidelines for the Consumption and Storage of Food and Beverages in Laboratory Areas
  - Guidelines for the Safe Use of Sharps
  - Guidelines for Chemical Waste Management in Laboratories
  - SAF-370, Personal Protective Equipment (PPE) Guidelines
- Regulatory Source Links:
  - 29 CFR 1910- Occupational Safety and Health Standards
  - NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules
  - CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition
  - Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, National Research Council
  - NFPA 45: Standard on Fire Protection for Laboratories Using Chemicals

	Item	What is the Safety Reason?	How Can I Comply?	Regulatory Sources	Institutional Document
GENERAL SAFETY **Administrative Controls**					
1.1	The external lab doors are posted with EHSO provided signage that reflects the hazards present in the lab and displays current emergency contact information.	The lab sign indicates hazards within the lab to both internal and external members including maintenance staff or first responders that may enter. Contact information is listed in case of equipment malfunction (ex. freezer failure or fire).	To request a new sign or update an existing sign, complete the Lab Signage Requirements Form and email it to labsign@emory.edu.	29 CFR 1910.1450(f)(1) 29 CFR 1910.1450 appendix A (A2) and (D8) 29CFR1910.1450 appendix D(7) 29 CFR 1910.1030	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-351, Chemical Hygiene Plan SAF-310, Biosafety Manual

1.2	All lab personnel have received training regarding workplace hazards, including applicable EHSO training courses.	While lab personnel are performing research, they will likely use instrumentation, materials, and reagents that have the potential to harm themselves, their co-workers and/or the environment. It is important to spend time outside of the research project learning the safety standards of the discipline and workplace to ensure everyone's good health and safety.	Click here to visit the EHSO Training site to see which courses are applicable to your work. Tip: Print the "All Learning" pages for the employees. Use EHSO's Training Tracking Sheet to track when trainings are due.	29CFR 1910.1030(g)(2)(i) - (v) 29 CFR 1910.1450(f) 29 CFR 1910.1200(b)(3)(iii) NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-351, Chemical Hygiene Plan SAF-310, Biosafety Manual
1.3	Personnel are subscribed to and have read the monthly Lab Rat Newsletter.	The Lab Rat Newsletter is EHSO's way of providing pertinent information directly to the research labs. Information such as important changes to regulations, safety tips, changes in communication/ contact information, fire extinguisher training, etc can all be found in the Lab Rat Newsletter.	To receive the newsletter, personnel need to be added to the PI's registration in BioRAFT. Old Lab Rat newsletter articles can also be found on the EHSO Blog.	29CFR1910.1450(f)(2)	SAF-351, Chemical Hygiene Plan

1.4	Personnel have received annual fire extinguisher training by either: (1) reading the Annual October Edition of the Lab Rat Newsletter or (2) attending hands-on training from the Emory Fire Safety Office.	Laboratories are filled with potential fire hazards; therefore, all laboratory personnel should know how to use a fire extinguisher in case a fire occurs in the laboratory.	October is Fire Safety Month! Each October, EHSO publishes Fire Safety training in the Lab Rat Newsletter. Old Lab Rat newsletter articles can also be found on the EHSO Blog. Otherwise, contact Emory's Fire Safety Office to schedule a hands-on training session.	29 CFR 1910.155(c)(14) 29 CFR 1910.157(g)(1) 29 CFR1910.157(g)(2) OSHA Letter of Interpretation	

1.5	Volunteers working in the lab have completed and submitted the EHSO Registration Form for Volunteers and have completed appropriate trainings.	The Volunteer in Research Lab Registration Form is important to verify training has been completed by any volunteers working in the lab. Volunteers are not Emory employees; therefore, their sponsor must request an Emory Learning Management System (ELMS) account (instructions) for them.	The Volunteer in Research Lab Registration Form should be completed for adult volunteers (i.e., persons 18 years of age or older) who want to participate in activities in research laboratories and who are not enrolled in an Emory University or Oxford College regular catalog course or degree program; or not employed by Emory University as a full-time or part-time employee.		Emory University Volunteer Policy

1.6	Minors working in the lab have completed and submitted the EHSO Registration Form for Minors. They have completed hazard specific safety training including Lab Safety Awareness Training from EHSO as well as any other safety training required by EHSO, IACUC, Department of Animal Resources (DAR) or the Yerkes National Primate Research Center (Yerkes).	The Minors Participating in Research Labs Form is important to verify training and immunization requirements have been completed by any volunteers under the age of 18 working in the lab. Their sponsor must request an Emory Learning Management System (ELMS) account (instructions) for them.	The Minors Participating in Research Labs Registration Form should be completed for volunteers under the age of 18 who want to participate in activities in research laboratories and who are not enrolled in an Emory University or Oxford College regular catalog course or degree program; or not employed by Emory University as a full-time or part-time employee.		Emory University IACUC, Minors in Laboratories Emory University Policy and Procedure on Minors in Laboratories

Housekeeping/ Work Practices					
1.7	Lab equipment is decontaminated on a routine basis in addition to any of the following instances: • After spills, splashes, or other potential contamination • Before repair, maintenance, or removal from the lab Tip: Use the Equipment Hazard Tag before removing equipment from the lab.	Equipment used in laboratories may become contaminated with biological, chemical or radioactive materials. While individuals in these environments may be protected from potential hazardous exposures through safety controls and administrative practices, anyone receiving such equipment expects that the equipment is clean and decontaminated. When removing equipment, decontamination is required.	When disinfecting: -Wear appropriate PPE. At a minimum, this is a lab coat, gloves, and glasses. For biological: Use the correct disinfectant and ensure appropriate contact time. Fully remove disinfectant. For chemical: contact EHSO for help. For radiological: If you are comfortable, you can clean your own radiological contamination. Clean with an all-purpose cleaner and place contaminated paper towels in dry radioactive waste containers.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition 29 CFR 1910.1030 (d)(2)(xiv) 29 CFR 1910.1450	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-310, Biosafety Manual SAF-351, Chemical Hygiene Plan

1.8	Aerosol cans are stored away from heat and ignition sources.	Aerosol cans contain flammable material. When the aerosol can comes into contact with heat or an ignition source, a fire can result.	Click here to view a video showing how aerosol cans react when they encounter a heat source – fire. Be aware of heat and ignition sources in the lab. Such sources can be Bunsen burners, hot plates, matches, etc.	29 CFR 1910.106(B)(6) 29 CFR 1910.1450 appendix A 29 CFR 1910.106 (e)(2)(iv)(c)	SAF-351, Chemical Hygiene Plan
1.9	There is a sink available for washing hands and supplied with soap and paper towels. If sink is unavailable, hand sanitizer is used as a temporary mode of hand sanitation and personnel wash their hands with soap and water afterwards at the nearest sink.	Persons must have the ability to sanitize their hands after removing gloves and before leaving the laboratory. If someone has an exposure, lab personnel should wash at the closest sink for 15 minutes with soap and water.	If a sink is available, ensure there is an adequate amount of paper towels and hand soap available. If there is no sink, hand sanitizer should be available as a temporary mode of hand sanitation.	29 CFR 1910.1030(d)(2)(iii-iv) CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section III, pp.25 NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules, Appendix K (II)(C)/ Appendix G (II)(A)(1)(h) 29 CFR 1910.141(b)(1)(i)	SAF-351, Chemical Hygiene Plan SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan

1.10	Persons wash their hands after working with potentially hazardous materials and before leaving the lab.	This is important to prevent the release of hazardous materials to the environment and exposure to co-workers, others in the vicinity, or yourself. Handwashing prevents cross contamination and accidental ingestion of hazardous materials.	After working with potentially hazardous materials and before leaving the lab, lab personnel should sanitize their hands with soap and water. Be sure to periodically check the supply level of paper towels and soap at sinks designated for handwashing.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section III, pp. 25 NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules Appendix K (II)(C)/ Appendix G (II)(A)(1)(h)	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan
1.11	Sinks are free of foreign objects that could cause drain stoppage.	If the drain is blocked, liquid cannot be flushed down the sink. An accumulation of small items (i.e., pipette tips, cover slips, etc.) being disposed of down the drain can cause the sink to clog. If left unnoticed, liquid that would normally flush out is unable to causing the sink to overflow. This could cause a lab flood or other safety hazard (slip, fall, electrical), leading to expensive repair costs.	Check your sink routinely to ensure that the sink is free of items that could cause it to clog. Use drain covers to prevent small items from entering the drain.	29 CFR1910.22(a)(2)	

1.12	No water-reactive compounds are stored under sinks. Cleaning products (i.e., 70% ethanol, bleach, dishwashing detergent) are the only chemicals that should be stored under sinks.	This item is to prevent an unwanted chemical reaction in the event of a leak under the sink.	Remove any water-reactive chemicals (alkali metals, anhydrides, carbides, peroxides, etc.) from underneath the sink and place in a separate area with other, compatible chemicals.	NFPA 45 Chapter 9 (9.2.3.3) EPA-600/2-80-076	SAF-351, Chemical Hygiene Plan
1.13	Food/drink/cosmetics are not present in the lab.	This is to protect the lab personnel. Food, drink, cosmetics, etc. can become contaminated when in the lab. If lab personnel eat, drink or apply, contaminated material, they may become ill. Lotions that do not contain mineral oil and/or petrolatum products are acceptable for lab use. Lotions that do contain these can degrade gloves. Contact EHSO for questions regarding lotion suitability.	Remove any food, drink, and/or cosmetics from the lab. Even empty containers could be interpreted as food or drink items.	29CFR 1910.1030(d)(2)(ix) 29CFR 1910.1450 Appendix A(E)(1)(d) OSHA August 1993 Letter of Interpretation	Guidelines for the Consumption and Storage of Food and Beverages in Laboratory Areas SAF-351, Chemical Hygiene Plan SAF-311, Bloodborne Pathogens Exposure Control Plan

1.14	Lab is free from trip hazards (examples: equipment on floor, cardboard boxes, electrical cords, etc.).	This is important to prevent a fall or injury.	Remove any items that may pose a trip hazard. Redirect the path of electrical cords that cross the floor or use floor cord protector strips. Slide unused cardboard boxes under bench-tops or place on overhead shelves. Review additional guidance from EHSO here.	29CFR 1910.22(a)(1)	
1.15	Hazardous reagents and samples are labeled and stored upright in appropriate containers in refrigerators and freezers.	Labeling hazardous reagents/samples protects and informs other lab personnel when they come into contact with the reagents/samples. Hazardous reagents/samples should be stored upright to prevent a spill. If there is a spill, having the container labeled will inform lab personnel on how to correctly and safely clean up the spill.	Label all reagents, solutions, stocks, etc. with the appropriate name of the contents and hazard. Store containers upright in refrigerators and freezers. Use racks or boxes to organize small containers.	29CFR 1910.1030(d)(2)(xiii) 29CFR 1910.1450(h)(1)(i) 29CFR 1910.1200(f)(6)	SAF-351, Chemical Hygiene Plan SAF-311, Bloodborne Pathogens Exposure Control Plan

1.16	Lab doors are not propped open. Lab doors are self-closing and have locks in accordance with the institutional policies.	The building is designed to maintain negative directional air flow from the corridor to the lab spaces. When the doors are left open, the building's ability to do this is compromised.	Do not prop open any lab doors. If you feel your lab door does not close/lock according to institutional policy, contact EHSO or Campus Services.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section VI pp. 110 29CFR 1910.1450 Appendix A(4) ANSI Z9.5 4.4-4.6, 6.1	SAF-310, Biosafety Manual SAF-351, Chemical Hygiene Plan
1.17	Animal and plants not associated with the work being performed are not present in the lab.	When animals and plants that are not associated with the research are present in the lab, they could potentially be exposed to the hazards present in the lab.	Remove any animals or plants that are not associated with the work being performed in the lab.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules	
1.18	Airflow is negative to the corridor. To test: Crack open an exterior door and hold a Kimwipe or paper towel to the door. If the air blows the wipe towards the inside of the lab, then the airflow is negative. If it blows the Kimwipe outside of the lab, the airflow is positive.	The building is designed to maintain negative directional air flow from the corridor to the lab spaces. Thus, if something hazardous is released within the lab, it is contained inside the lab and not distributed throughout the entire building.	Periodically, test for directional airflow. Contact your building liaison if your lab is experiencing positive airflow.	29CFR 1910.1030(e)(4)(vi) CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition ANSI Z9.5 NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan

1.19	Electrical cords are appropriate and well maintained including: (a) no 3-pin to 2-pin adapters (b) no damage or fraying (c) no overloaded electrical outlets (d) no daisy-chaining of electrical cords (e) no extended use of power strips or extension cords.	Improper use of electrical cords can cause a fire or electrical hazard. Use of damaged or frayed cords deems the interior electrical wires vulnerable to a splash/spill causing a fire or electrical hazard. Overloading outlets can cause surrounding areas to lose power or an electrical reaction posing a fire hazard.	Use appropriate plugs for each outlet. If a different outlet is needed, contact FM to rewire a new outlet. Contact FM or an electrician to replace damaged or frayed wires. Relieve overloaded outlets from a few cords and find a new outlet, use an extension cord, or surge protector.	29CFR1910.334(a)(2)(ii) 29CFR1910.334(a)(3)(iii) 29CFR 1910.304(b)(4) 29CFR 1926.416(e)(1) 29 CFR 1910.301	SAF-362, Electrical Safety Program
Sharps					
1.20	Unprotected sharps are not present in the lab (examples: razor blades, scalpels, needles, Pasteur pipettes).	Researchers should employ work practices that prevent accidental injury and reduce the risk of an exposure incident.	Labs can use materials around the work area to protect sharp edges. As a method of good practice, the edges of sharp objects (needles, razor blades, scalpels) should be covered when the items are not in use.	29CFR1910.1030(d)(2)(i) CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-310, Biosafety Manual Guidelines for the Safe Use of Sharps

1.21	Needles are not bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal unless in an EHSO-approved procedure and protocol.	To prevent accidental injury, the needle should be placed directly into the sharps container immediately following use.	Review the EHSO Guidelines for the Safe Use of Sharps portrayal of the "one-handed" technique.	29 CFR 1910.1030(d)(2)(vii)	Guidelines for the Safe Use of Sharps SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-310, Biosafety Manual
1.22	Reusable sharps (i.e. scalpels, surgical scissors, etc.) are placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.	Reusable sharps should be placed in a hard walled container (preferably containing the appropriate disinfectant) to minimize injury during storage. The dishwasher/autoclave should be used as a method of decontamination to prevent handling of individual sharps devices.	Review the EHSO Guidelines for the Safe Use of Sharps. Since the containers will also be reused, each container will need to be decontaminated on a routine basis. Recommendations for sterilants and disinfectants can be found here.	29 CFR 1910.1030(d)(2)(viii) CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-310, Biosafety Manual

1.23	Disposable sharps are disposed of in a sharps disposal container and the containers are no greater than ¾ full. The sharps container lid is either kept shut or designed to prevent the contents from spilling.	To prevent occupational injuries from contaminated sharps, these items (scalpels, syringes) should be immediately discarded into a nearby sharps container. The sharps container should be discarded when it is no greater than ¾ full to prevent overfilling. The contents must not be able to spill out of the container in order to prevent accidental exposure.	Place sharps containers as close to the point of use as possible. Workers should not have to walk to deposit sharp objects into the sharps container. The sharps container must be replaced once it is 3/4ths full to prevent overfilling.	29 CFR 1910.1030(d)(4)(iii)(A)(2)(i) CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-310, Biosafety Manual Guidelines for the Safe Use of Sharps
1.24	Broken glass containers with plastic liners are available and the containers are no greater than ¾ full. Tip: Rinsed out amber glass bottles that are intact can be recycled.	Broken glass containers are designated for the disposal of non-contaminated broken glass. This practice of using the broken glass container to dispose of non-contaminated broken glass helps to segregated contaminated and non-contaminated broken glass.	Purchase a “Glass Box” or “Broken Glass Box” from a Lab Safety Supply Vendor. The Glass Box should be lined with a plastic liner. Once it is 3/4ths full, the Glass Box should be closed, taped, and placed outside of the lab. It will be removed by housekeeping/ custodial staff.	29 CFR1910.1030(d)(4)(ii)(D) 29 CFR 1910.1450	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-351, Chemical Hygiene Plan

	Item	What is the Safety Reason?	How Can I Comply?	Regulatory Sources	Institutional Document
CHEMICAL SAFETY					
			Engineering Controls		
2.1	All Chemical Fume Hoods (CFHs) have been certified within the last 12 months and the certification label is attached and initialed by the certifier.	CFHs must be certified annually to ensure that they are functioning properly, and that they are maintaining a flow rate of 80-120 linear feet per minute with the sash being raised at 18 inches.	EHSO coordinates CFH certification. There is no action required by researchers unless it is observed that the CFH is not functioning properly, or has not been certified within past 12 months. If that is the case, contact EHSO.	29 CFR 1910.1450(e)(3)(ii); 29 CFR 1910.1450 (e)(3)(iii) NFPA 45 Chapter 7.14.1 ANSI/AIHA 29.5-2003 SEFA 1.2-2002	SAF-351, Chemical Hygiene Plan
2.2	The CFH is not overcrowded with equipment, storage containers, etc.	Overcrowding of the CFH can interfere with the airflow inside the hood. It can also make it difficult to work inside, increasing the potential for spills, accidents, etc.	Avoid storing materials (broken equipment, surplus chemicals, large containers, etc.) inside the CFH where possible.	29 CFR 1910.1450(e)(3)(ii); 29 CFR 1910.1450(e)(3)(iii) 29 CFR 1910.141(a)(4)(ii) ANSI Z9.5 (1992) 5.5 NFPA 45 Chapter 8.2.2.1	SAF-351, Chemical Hygiene Plan

2.3	CFH work surfaces are clean and free of obvious chemical residue.	Chemical residues have the potential to cross contaminate other work materials and can potentially create unwanted chemical reactions in the event of a spill. Also, having clean work surfaces is a good chemical hygiene practice.	Decontaminate work surfaces after experiments are complete.	29 CFR 1910.1450 (e) (3) (viii) (A-D) 29 CFR 1910.141(a)(4)(ii) ANSI Z9.5 (1992) 4.13.2	SAF-351, Chemical Hygiene Plan
2.4	CFH sash is not propped open with lab equipment and alarm is not muted.	If the sash of the CFH is propped open, it is indicative of the sash being broken. The sash must be able to stay open without having to be propped open. The CFH alarm is an indicator of improper airflow inside the hood. The alarm must be enabled in order to alert the user that there is an issue with airflow.	If the sash of the CFH is being propped open, a work order must be submitted to Campus Services to have it repaired. If the CFH is equipped with an alarm, ensure that it is enabled.	29 CFR 1910.1450 (e)(3)(ii); 29 CFR 1910.1450 (e)(3)(iii) ANSI Z9.5 (1992) 5.5(f) NFPA 45 Chapter 7.8.7	SAF-351, Chemical Hygiene Plan

2.5	Tubes, hoses, and cables are routed through transfer/access ports or other openings that will not inhibit proper sash closure and operation.	When tubes and hoses are routed through the front of the CFH, they interfere with the complete closure of the sash. This can create a hazard in the event that the sash needs to be completely closed (i.e., fire, violent chemical reaction, smoke).	Avoid routing cables and hoses through the front side of the fume hood other than through a designed access port.	NFPA 45 Chapter 7.3.3(3) ANSI Z9.5 (1992) 5.5(f)	
2.6	Vented storage areas under the CFH are free of spilled chemicals. The walls in the vented storage areas under the CFH are intact.	Spilled chemicals left unattended in vented areas of the CFH evaporate, creating potentially hazardous vapors. The walls of these storage areas must remain intact to prevent the accumulation of chemical vapors. Chemical vapors are vented out of the cabinet.	Small chemical spills in these areas should be immediately cleaned by lab personnel, when discovered. Instructions to clean small spills can be found in the “Just in Time” flipchart located on the inside of the lab. If personnel are not comfortable cleaning small chemical spills, contact the EHSO Spill Team for assistance.	SEFA 1.2-2002 29 CFR 1910.1450	SAF-351, Chemical Hygiene Plan
General Chemical Storage					

2.7	An inventory listing all chemicals stored in the lab is available.	Chemical inventories are necessary to ensure employees are aware of the hazards present in their work area, encourage management of purchased reagents and materials and provide helpful information to Emergency Responders during emergencies.	Labs can make a list of each purchased chemical by using an excel file, chemical tracking software, or use the Chemical Inventory functionality in BioRAFT (highly recommended). Labs also have the option of using the Chemical Inventory function of BioRAFT. Chemical inventories can be sent to csp@emory.edu and incorporated into a lab's BioRAFT profile. Update the chemical inventory upon purchase of chemicals and discarding chemical stock as waste. Be sure to include Chemical Name and location within the lab. Volumes are not necessary.	Prudent Practices pg 66 EPCRA 311-312 OSHA 3084 29 CFR 1910.1450	SAF-351, Chemical Hygiene Plan

2.8	Chemical containers are in good condition. For example, lids are not cracked and crystals are not forming on the inside or outside of the container.	Chemical containers need to be able to contain the chemicals that are inside. If the containers are not in good condition, unwanted reactions or unexpected chemical spills could occur.	On occasion, examine chemical stock bottles to ensure that there are no cracks in the containers or the caps/lids. Also, inspect the stock bottles for the formation of crystals inside the bottles or around the caps/lids.	29 CFR 1910.1450 (f)(4)(i)(A) OSHA 3084	SAF-351, Chemical Hygiene Plan
2.9	Legacy / obsolete chemicals (inherited, unused for 10+ years, or off spec) are collected and given to EHSO for disposal.	Legacy chemicals can be toxic to individuals and the environment. A legacy or obsolete chemical is a chemical that is no longer usable in the lab.	Contact EHSO at chemwaste@emory.edu to have bottles of concern removed and disposed of safely. Visit the EHSO Chemical Management Campaign for more information: http://www.ehso.emory.edu/waste/waste-chemical.html	40 CFR 262.208(b): 40 CFR 262.208; 40 CFR 262.206	Guidelines for Chemical Waste Management in Laboratories

2.10	All chemical containers (including stock bottles, solutions, and beakers) are labeled legibly with: a) the full chemical name in English as indicated on the stock bottle (Example: Ethanol - not ETOH) b) the specific hazard (Example: Ethanol - flammable).	Chemical containers must be labeled so that the contents of the container can be identified as well as any associated hazard. Labeling chemical containers in English, as opposed to another language or chemical structures ensures that anyone (including laypersons) can identify the contents of the container.	Ensure that all stock bottles and working containers are labeled (in English) with the full chemical name, and if hazardous (flammable, toxic, carcinogenic, etc.), the associated hazard. For working stock containers with hazardous materials in them, each associated hazard should be present on label.	29 CFR 1910.1200 29 CFR 1910.1450	SAF-351, Chemical Hygiene Plan
2.11	Chemicals are stored by compatibility: a) flammables and oxidizers are separated; b) mineral and organic acids are separated c) bases are stored in a separate cabinet from acids. Examples of mineral acids (Hydrochloric Acid, Sulfuric Acid); Examples of organic acids (Acetic Acid, Trifluoroacetic Acid)	The storing of incompatible chemicals in the same cabinet or area can cause unwanted chemical reactions when combined (example – broken bottles, spilled chemicals, etc.).	Separate all flammables and oxidizers by storing them in different locations; separate all acids from bases by storing them in different locations; store all mineral acids separately from organic acids (if stored in the same cabinet, use secondary containment to separate). Refer to the Chemical Compatibility Chart if you are unsure.	29 CFR 1910.1450 NFPA 45 Chapter 9 (9.2.3.3) NFPA 45 Chapter 8 Storage (8.2.4.2)	SAF-351, Chemical Hygiene Plan Chemical Compatibility Chart

2.12	Liquid corrosives are stored: a) in a corrosives cabinet b) and have secondary containment. Examples of secondary containment for liquid corrosives are Nalgene or Polypropylene containers.	Corrosive materials can cause the destruction of various materials, including wood, plastic, and human skin. Liquid corrosives must be stored in secondary containment so that in the event that the primary container is broken, the liquid can stay contained and not spread to areas where it can cause damage.	Store containers of liquid corrosives inside an appropriate corrosives cabinet with a polypropylene liner. Containers should also be stored in secondary, polypropylene containers inside of the cabinet. If liquid corrosives are incompatible, store in separate secondary containment.	NFPA 45 Chapter 8 (8.2.2.2) 29 CFR 1910.1450	SAF-351, Chemical Hygiene Plan
2.13	Flammables are: a) stored in an approved flammable liquids cabinet, b) or volume stored outside the cabinet does not exceed 16 L/100 ft^2 of lab space.	Flammables must be stored in cabinets that help to protect the material from fire. In the event of a fire, the flammable liquids cabinet will contain and protect the flammable material from the fire.	Labs should utilize the flammable liquid storage areas under their CFHs. If space under the fume hood is inadequate, consider purchasing an additional flammable liquid cabinet. Cost can be distributed among multiple labs if cabinet is shared with/used by other laboratories.	40 CFR 1910.106(d)(3)(i); 1926.152(b) 29 CFR 1910.1450 NFPA 45 Chapter 8 (8.2.2.2):	SAF-351, Chemical Hygiene Plan

2.14	Hazardous chemicals are stored: a) on bench tops, shelves or cabinets. b) on the floor in secondary containers and in such a way that they do not pose a trip hazard.	When hazardous chemicals are stored, it must be in a manner that the chemicals are contained inside their appropriate containers. If they are stored on unstable surfaces or on the floor, they could fall or pose a trip hazard which can ultimately lead to a chemical spill.	Store all chemicals on stable bench tops, shelves, or cabinets. If space is an issue and chemicals must be stored on the floor, store them in compatible secondary containment that is adequate to prevent inadvertently kicking and breaking containers.	29 CFR 1910.1450	SAF-351, Chemical Hygiene Plan
2.15	Hazardous chemicals are stored in such a way as to prevent release to the environment by being: a) tightly capped at all times except when in use; b) and stored away from drains and sinks. Examples of secondary containment for liquid corrosives are Nalgene® or Polypropylene containers.	Some hazardous chemicals produce hazardous vapors. Leaving these chemical containers uncapped may lead to employee overexposure to the chemical(s). When this occurs inside a CFH, the hazardous vapors escape to the outdoor environment. Hazardous chemicals must be kept away from drains to prevent discharge to the sanitary sewer in the event of a spill.	Ensure that hazardous chemicals containers are always capped tightly (unless in use) to prevent the release of hazardous vapor. Also, ensure that hazardous chemicals are not stored near sink drains.	40 CFR 262.104 (h) 29 CFR 1910.1450 NFPA 45 9.2.3.1 NFPA 400 6.1.3.1 – 6.1.3.5 NFPA 45 8.2.2.3:	SAF-351, Chemical Hygiene Plan

2.16	Flammable or volatile liquids are stored in a flammable storage refrigerator when refrigeration required.	Flammable vapors can build up within a standard refrigerator over time, which may lead to a fire hazard if the vapor comes into contact with an ignition source within the unit. The ignition source could be a spark from a moving mechanical part, such as the fan, the switch that turns the light on and off, or the thermostat turning on and off. Standard refrigerators are not designed to prevent flammable vapors from coming into contact with these potential ignition sources.	Ensure that flammable /volatile liquids are not stored in refrigerators unless required. When required, store flammable liquids in an approved flammable liquids refrigerator.	NFPA 45 12.2.2 29 CFR 1910.1450 (2)(l)	SAF-351, Chemical Hygiene Plan

Special Chemical Hazards					
2.17	Written lab procedures are in place for Special Chemical Hazards (highly toxic substances, acetyl cholinesterase inhibitors, pyrophoric compounds, shock sensitive compounds, water reactive compounds, mutagens, teratogens, carcinogens, and unstable compounds).	Chemicals that are particularly hazardous may require more stringent methods for storage and handling including: additional personal protective equipment, special decontamination procedures, and waste disposal procedures. These procedures and methods need to be documented and available for lab personnel for guidance and training.	Make written lab procedures for special chemical hazards available for all lab personnel, and ensure that all personnel have been trained on them. Use the Written Lab Procedures for Chemicals with Special Hazards template for writing your SOP:	29 CFR 1910.1450	SAF-351, Chemical Hygiene Plan
2.18	Compounds identified as Special Chemical Hazards are: a) stored securely in compatibility groups, separate from general storage b) handled according to the lab's written procedures.	The storing of incompatible chemicals in the same cabinet or area can cause unwanted chemical reactions when combined (example – broken bottles, spilled chemicals, etc.).	Ensure that all of your special chemical hazards are separated by compatibility groups. Refer to the chemical's Safety Data Sheet.	29 CFR 1910.1450	SAF-351, Chemical Hygiene Plan

2.19	Peroxide-forming chemicals are: a) labeled with the date received and the expiration date. b) Expired containers of peroxide-forming chemicals are immediately disposed of properly through EHSO.	Some chemicals have the potential to form explosive peroxides once they are opened. They need to be labeled with the date received and the expiration date in order to know the appropriate disposal date.	Peroxide forming chemicals should be disposed of through EHSO within 6 months of opening. Write the received date on chemical containers. Move older chemicals to the front of shelves so they are used first.	NFPA 45 Chapter 9 "Prudent Practices in the Laboratory" Section 5.D.1 29CFR1910.1450	SAF-351, Chemical Hygiene Plan
2.20	The PI **or** his/ her designee for each lab has completed a Lab Formaldehyde Questionnaire. This includes multiple explanations for each **procedure** using formaldehyde, if necessary.	Formaldehyde is a carcinogenic chemical. The evaluation form needs to be submitted to determine whether formaldehyde monitoring is warranted for the individuals who use it.	Complete the Formaldehyde Evaluation Form here. Industrial Hygiene will contact you to schedule monitoring as necessary.	29CFR1910.1048 (d)	

2.21	a) Alternatives to mercury are used, or if mercury-containing device is still in use, it is intact and not leaking. b) Mercury leaks or spills are reported to EHSO immediately. Tip: Mercury thermometers will have silver liquid in them. Alcohol thermometers will usually have a red or blue liquid in them.	Mercury is a neurotoxic chemical. Devices containing mercury should be handled with care to ensure the mercury is contained. If mercury begins to leak from the device, then EHSO should be contacted.	Utilize alcohol or kerosene thermometers as alternatives to mercury thermometers. If a mercury containing device begins to leak, then place the device in a secondary container. Dispose of the device through EHSO, by using the online waste collection form available at ehso.emory.edu.	40 CFR 273.4 (b)(3) 40CFR 273.33 (c)	Guidelines for Chemical Waste Management in Laboratories
2.22	Unused mercury containing devices (thermometers, thermostats, etc.) are disposed of through EHSO.	Mercury is a neurotoxic chemical. If alternatives are available, they should be substituted and given to EHSO for disposal.	Unused or unwanted mercury thermometers and other mercury containing devices can be disposed through EHSO, by using the online waste collection form available at ehso.emory.edu.	40 CFR 273.4 (c)(2) 40CFR273.4(a); (b)(1)-(b)(3); (c)(1)-(c)(2) 40CFR273.33(c)(1)-(c)(6)	Guidelines for Chemical Waste Management in Laboratories
DEA Controlled Substances *Note: For more details regarding this section, review the controlled substances page from the Office of Compliance* http://compliance.emory.edu/controlled-substances/index.html					

2.23	Federal DEA and State Georgia Board of Pharmacy Licenses are available.	Researchers that possess controlled substances must be licensed through Federal and State agencies.	Visit the DEA's website for more information on how to become a DEA registrant.	21 CFR 1301.11 (a) O.C.G.A. 16-13-35 (a)	See link above.
2.24	DEA-regulated items are secured in a locked container.	Controlled substances must be secured to ensure the drugs are used for their intended purpose.	Submit a work order to Campus Services and have a lock installed on a cabinet or purchase a safe or lock box from a commercial vendor. The key to the cabinet, lock box, or safe should be kept in a secure location.	21 CFR 1301.75 (a)	
2.25	Lab maintains proper recordkeeping of DEA controlled substances (including stock, usage, and disposal).	These substances have a high potential for abuse; on-hand quantities must monitored properly to insure that the inventory is accurate. To prevent regulatory fines and other severe consequences, researchers must ensure that inventory logs remain current.	Utilize a manual tracking system (such as a log book or spreadsheet) to document the inventory of DEA controlled substances.	21 CFR 1304.03 (a)	

2.26	Expired or unwanted controlled substances are disposed of through an authorized reverse distributor.	Controlled substances cannot be disposed of through EHSO. Controlled substances must be surrendered to an authorized reverse distributor.	Drugs must be labeled "Expired – Do Not Use" or "Unwanted – Do Not Use.		Emory's Research Use of Controlled Substances Policy
Compressed Gas Cylinders					
2.27	Compressed Gas Cylinders are: a) Tagged as "empty" or "full" when not in use b) Labeled as to their contents c) Stored upright and secured to a stationary surface by a chain link or strap that is approximately two thirds up the cylinder d) Capped when not in use and have a pressure regulator when in use	Gas cylinders must be secured to prevent them from tipping. When gas cylinders tip over, the valve could be broken, creating a "rocket" with the potential to cause injury, death, and damage to property. Gas cylinders should be tagged as full or empty to ensure that empty containers are returned to the vendor.	Read more about securing gas cylinders here. Click here to view an insightful demonstration of what can go wrong when a gas cylinder is not properly secured.	Compressed Gas Association Pamphlets (C-6-1968 and C-8-1962) CGA P-1 2008 (Chapter 5) 5.2.1; 5.2.3; 5.5; 5.8.2; 5.8.4 -- 5.2.1 NFPA 45 Chapter 10 - 10.1.5.1 NFPA 55 - Compressed Gases Chapter 7 - 7.1.10.2 29CFR1910.101(a) OSHA Letter of Interpretation - May 23, 2008	SAF-351, Chemical Hygiene Plan
2.28	Lecture bottles have been replaced with appropriate gas cylinders as appropriate.	Lecture bottles cannot be returned to the gas supplier. They become difficult and expensive to de-valve when it is necessary to dispose of them.	Utilize gas cylinders instead of lecture bottles to reduce disposal costs.	Compressed Gas Association Pamphlets (C-6-1968 and C-8-1962)	SAF-351, Chemical Hygiene Plan

Chemical Waste *Note: For more details regarding this section, review the Chemical Waste Disposal in Laboratories document at* http://www.ehso.emory.edu/content-guidelines/GuidelinesforChemicalWasteDisposal.pdf					
2.29	● The final destination for chemical waste (including non-DEA controlled pharmaceutical waste) is EHSO. ● Chemicals are not poured down the drain or discarded in regular trash or biohazard waste.	Chemical waste, if discarded into the incorrect waste stream, can ultimately contaminate water sources, landfills, or the air due to improper disposal.	Dispose of all chemical waste through EHSO, by using the online waste collection form available at ehso.emory.edu. Note: Refer to Guidelines for Chemical Waste Management in Laboratories for details. To request a pickup, use the online waste collection form available at ehso.emory.edu	40 CFR 262.208 40 CFR 262.206 40 CFR 261.2	SAF-351, Chemical Hygiene Plan

2.30	a) All chemical waste is stored either in EHSO provided chemical waste containers with completed EHSO Chemical Waste Labels, b) or in alternative compatible waste containers with completed EHSO Chemical Waste Labels.	Chemical waste must be identified from all other materials using the EHSO Chemical Waste label.	Waste labels can be printed from the EHSO website. Labs can also contact their Building Liaison for EHSO Chemical Waste Labels.	40 CFR 262.105 (b) (9) 40 CFR 262.210 40 CFR 262.206 40 CFR 262.34(a)	SAF-351, Chemical Hygiene Plan
2.31	Chemical wastes are compatible with their containers and are stored by compatibility. For example, acid waste is not stored with alkaline waste.	Chemical wastes must be protected from ignition or reaction. Ignition or reaction can come from incompatible material, such as incompatible waste. Chemical wastes must be stored by compatibility in proper containers (able to contain the waste materials without degradation of the container).	Labs can submit a request to obtain containers for liquid waste, dry waste, or caustic wastes using the online waste collection form available at ehso.emory.edu. Information about different containers can be found here.	40 CFR 265.172 40 CFR 265.177 40 CFR 264.17 40 CFR 265, Subpart 1	SAF-351, Chemical Hygiene Plan

2.32	All chemical waste containers are stored securely by: a) Being closed except when in use. b) Being in secondary containers when near sinks or drains.	Keeping containers securely closed will prevent accidental chemical spills.	Unless adding waste to the container, screw the cap tightly onto the threaded bottleneck after each use. If using a device, such as an Eco Funnel System, make sure that the ring is tighten around the threaded bottleneck and the lid is snapped in place.	40 CFR 265.173 (a) 40 CFR 265.173 (b)	SAF-351, Chemical Hygiene Plan
2.33	All empty non-P-listed chemical containers are triple rinsed (rinsate disposed of down the drain), labels defaced, and caps removed prior to disposal via regular trash or recycling.	Non P-listed chemical containers must be triple rinsed to remove any hazardous chemical residue.	Place a small amount of water into the empty bottle. Swirl the water around the inside of the container and pour down the drain. Repeat this step three times. Then, deface the label and remove the cap. Once triple rinsed, recycled or dispose of the container via the regular trash or recycling bin. Tip: Most buildings have amber bottle recycling at their loading dock or in their service areas.	40 CFR 261.7	Guidelines for Chemical Waste Management in Laboratories

2.34	All empty P-listed chemical containers are given to EHSO for disposal.	P-listed chemicals are considered to be extremely toxic to the environment. Any residue from P-listed chemicals must be treated as hazardous waste.	Label all P-Listed chemicals to remind lab members that chemical container is considered hazardous waste and must be disposed of via EHSO, or check the P-List prior to disposal of any chemical container. Tip: Use your CAS number to check the P-list. Common P-listed chemicals on Emory's campus include Sodium Azide, Potassium Cyanide, Sodium Cyanide and Acrolein.	40 CFR 261.33(e)	Guidelines for Chemical Waste Management in Laboratories

	Item	What is the Safety Reason?	How Can I Comply?	Regulatory Sources	Institutional Document
BIOLOGICAL SAFETY **Administrative Controls**					
3.1	Lab has current and accurate Biosafety Protocol approval for all research activities involving biohazard materials.	This ensures that we meet the requirements for protocol review under the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules. It allows EHSO and members of the Institutional Biosafety Committee and Research Health and Safety Committee to conduct risk assessments for research involving biological/infectious materials.	Contact biosafe@emory.edu. Tip: Keep approval letters in Lab Safety Binder. You do not need to keep paper copies of your approved protocols.	NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules Biosafety in Microbiological and Biomedical Laboratories 5th Edition, pg 19	SAF-310, Biosafety Manual

3.2	Lab has biosafety SOPs. SOPs are stored in the Lab Safety Binder and have been signed by those working in the lab as a method of documenting lab-specific biosafety training. The biosafety SOP is reviewed annually and updated as needed.	EHSO provided Biosafety Training is limited to an overall view of safety and, due to the breadth of research conducted at Emory, cannot feasibly encompass all laboratory-specific training needs. By writing and training on laboratory-specific Biosafety SOPs, PIs and lab managers can ensure that everyone working in their lab understands the risks associated with their research and know how to work with specific agents safely.	Use the Biosafety SOP Template to create your lab's biosafety SOPs. We have also posted a Biosafety SOP Example to help you write your lab's first Biosafety SOPs.	NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition; Section IV, Laboratory Biosafety Level Criteria pg. 61	Lab Rat Newsletter: Biosafety SOP Template Example
3.3	Labs that process clinical samples from humans and provide information for the diagnosis, prevention, and/or treatment of any disease for the purpose of a health assessment possess a CLIA certificate.	CLIA stands for Clinical Laboratory Improvement Amendments. The CLIA program exists to ensure quality laboratory testing. The Centers for Medicare and Medicaid Services regulates all laboratory testing (except research) performed on humans in the United States through CLIA.	Clinical labs should visit the Centers for Medicare and Medicaid Services website to apply for and maintain CLIA certification.	Clinical Laboratory Improvement Amendments: 42 CFR 493	

3.4	All individuals involved in the transportation/ shipping of hazardous materials other than biomedical waste (e.g., dry ice, infectious substances, or biological substances) have taken Shipping Training for Infectious and Biological Substances within the past 2 years and are certified to ship these materials. Training applies to employees and supervisors that prepare, verify or sign shipping papers (i.e., shipping declarations, airway bill), prepare packages for couriers, and/or transport packages to pick-up/drop-off location).	The training of individuals participating in the transportation of hazardous materials ensures that the materials move in a safe and secure manner to their intended destination without releases to the environment.	Shipping training is offered in a classroom setting every other month. The registration form is available through ELMS.	Department of Transportation Hazardous Materials Regulations: 49 CFR 172.700, 173.1, 175.200, 177.800 IATA Dangerous Goods Regulations 1.3.2. (a)-(e) Citation for Shipping Training	

3.5	A copy of the signed Shipping Training certificate(s) is stored in the lab safety binder. In the event that the lab is visited by a Department of Transportation or Federal Aviation Administration Inspector, they will request these as forms of training documentation.	Per 49 CFR 172.704(d) and IATA 1.5.5 a record of training (the certificate) must be retained on file and be made available upon request by national authorities.	All individuals trained by EHSO are provided a certificate at the end of the course. If you lose your certificate, you can print new one by going to the ELMS.	Department of Transportation Hazardous Materials Regulations: 49 CFR 172.704 IATA Dangerous Goods Regulations	

Engineering Controls					
3.6	All active Biological Safety Cabinets (BSCs) have been certified within the last 12 months by an Emory approved vendor, and the certification label is attached and initialed by the certifier.	Annual certification ensures that the BSC is operating properly so that it can adequately protect the user, product/sample and environment.	View instructions for placing a purchase order in Emory Express to have your BSC certified here.	NSF International, Biosafety Cabinetry: Design, Construction, Performance, and Field Certification Standard: NSF 49-2014 Annex F CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A 29 CFR 1910.1030	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-310, Biosafety Manual

3.7	BSCs that have failed certification or have not been certified within the last 12 months are tagged out of service and are not in use.	Using failed or non-certified BSCs puts you at risk of laboratory acquired infections, environmental contamination of infectious diseases, and product/sample contamination.	If you see a BSC with an "Out of Service" sticker or a notice that the BSC has failed certification, do not use it. To have a failed BSC repaired and recertified, place a purchase order through Emory Express. View instructions for placing a purchase orders in Emory Express for BSC maintenance here.	NSF International, Biosafety Cabinetry: Design, Construction, Performance, and Field Certification Standard: NSF 49-2014 CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A	SAF-310, Biosafety Manual
3.8	Bunsen burners and/or open flames are not used in the BSC. Flammable gas is not used or connected to the BSC gas lines (example: natural gas).	Most BSCs on campus recirculate air within the cabinet (Class II, Type A1, A2, and B2). If flammable gases are used in these types of equipment, overtime, the gas becomes more concentrated until it reaches an explosive level. Open flames and Bunsen burners should not be used in BSCs because they create turbulence that disrupts the pattern of HEPA-filtered air being supplied to the work surface. This results in a loss of personnel, product and environmental protection.	Do not have your BSC connected to flammable gas. If you notice that it is connected to flammable gas, place a work order through Campus Services to have the line disconnected. Instead of using Bunsen burners in BSCs, consider electronic alternatives such as bacto-incinerators or microincinerators. An example of a microincinerator may be found here.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A NSF International, Biosafety Cabinetry: Design, Construction, Performance, and Field Certification Standard: NSF 49-2014	

3.9	Intake and rear grilles are clear of obstructions.	When the front and/or rear grills of the BSC are blocked: ● Contaminated room air may blow across your work surface (contaminating your sample); and/or ● Contaminated cabinet air may blow towards you and contaminate the lab or expose you. Keeping the grills clear is essential to maintaining product, personal and environmental protection.	Plan your work before you start experiments in the BSC so you use only necessary equipment and materials to reduce overcrowding. Disinfect and remove supplies from the BSC when you are finished with your experiment. Do not store materials in the BSC. Tip: Watch this video on Biosafety Cabinet Airflow	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A	
3.10	No items are stored on top of the BSC.	Items can easily fall into the cabinet and damage the HEPA filters or fall off the cabinet and harm you. HEPA filters are essential to the proper, safe functioning of the BSC, are fragile and are expensive to replace.	Find alternative locations for items originally stored on top of your BSC.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A	

3.11	The BSC sash is functioning properly, set at an appropriate height, and not cracked. Sash is not propped open with lab equipment and alarm is not muted.	The BSC sash helps protect the worker from splashes of hazardous material. If it is cracked or not set at the appropriate height, the worker may not be protected. A broken sash propped open with lab supplies or other support device is a hazard to individuals working in the cabinet. If the support device falls out, the sash could slam shut, injuring the person working with their hands in the cabinet.	If the sash of your BSC is broken, place a purchase order through Emory Express to have it repaired. View instructions for placing a purchase orders in Emory Express for BSC maintenance. Keep your sash alarm unmuted so that you ensure you are working at the appropriate level.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A NSF International, Biosafety Cabinetry: Design, Construction, Performance, and Field Certification Standard: NSF 49-2014	SAF-310, Biosafety Manual

3.12	All active laminar flow hoods/clean benches have been certified within the last 12 months by an Emory approved vendor and the certification label is attached and initialed by the certifier. Laminar flow hoods/clean benches that have failed certification or have not been certified within the last 12 months are tagged out of service and are not in use.	Laminar flow hoods/clean benches use HEPA filtered, laminar airflow to maintain a clean work space. Annual certification ensures that the equipment is properly functioning.	View instructions for placing a purchase order in Emory Express to have your laminar flow hood/clean bench certified here.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan
3.13	Laminar flow hoods/clean benches are not used for work with biohazard material or other hazardous material.	Laminar flow hoods/clean benches blow air straight out to the worker or towards the work surface. Thus, air that has been in contact with the sample or product is not treated before it comes in contact with the user. Watch this video on the difference between BSC and laminar flow hood/clean bench airflow patterns.	Use a BSC when you need to work with biological hazards. Use a CFH when you need to work with hazardous chemicals. Laminar flow hoods/clean benches may be used when working with non-hazardous materials.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Appendix A Prudent Practices, *9.C.3.5 Clean Benches or Laminar Flow Hoods*	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan

General Biosafety					
3.14	All procedures involving the manipulation of infectious materials that may generate aerosols are conducted within a BSC or other physical containment devices.	BSCs use HEPA filtered air to protect the worker from aerosols that are generated during experimental procedures. Common procedures that are likely to generate aerosols include: pipetting, vortexing, centrifuging, sonicating, etc.	Move small centrifuges and vortex mixers into your BSC when you need to use them for work with biological hazards. When pipetting biohazard material, do so carefully inside a BSC.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section IV OSHA's Bloodborne Pathogen Standard: 29 CFR 1910.1030(e)(2)(iii)(A)	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan
3.15	Lab equipment and containers used to store or manipulate biohazard materials are labeled with biohazard labels where appropriate (i.e., refrigerators, incubators, centrifuges).	Biohazard labels are used to communicate risk and the specific hazard to people working or visiting your lab space.	Request extra biohazard stickers by sending an email to your designated building liaison. Stickers can be purchased for the lab from vendors (see example here).	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section IV OSHA's Bloodborne 29 CFR 1910.1030(g)(1)(i)(A) OSHA's Specification for Accident Prevention Signs and Tags: 29 CFR 1910.145(e)(4), (f)(8)(i)	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan

3.16	Secondary containment (i.e., centrifuge safety cups, buckets, sealed rotors) is available and used when centrifuging biohazard samples.	Using centrifuge safety cups or sealed rotors protects the user from being exposed to infectious aerosols in case a spill occurs during the centrifuge cycle. Always load and unload safety buckets and rotors inside a BSC to insure that you are protected from any produced aerosols.	If you don't have centrifuge safety buckets or means to seal your rotors, contact the centrifuge manufacturer.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Section II 29 CFR 1910.1030(e)(2)(iii)(A)	SAF-310, Biosafety Manual
3.17	Centrifuges have door interlocks (mechanism to keep lid closed during operation or shut the motor off when the lid is opened).	Interlocks are important because they prevent the operator from opening the lid while contents are spinning or shut the motor off when the lid is opened. This prevents occupational injuries (i.e., broken or caught fingers) and releases of aerosols or spills.	Only purchase centrifuges that are fitted with interlocks. Surplus centrifuges that do not have interlocks.	OSHA's April 14, 1993 Letter of Interpretation OSHA's Machinery and Machine Guarding Standard: 29 CFR 1910.212(a)(1), (a)(2), and (a)(3) OSHA's April 20, 1993 Letter of Interpretation OSHA's April 15, 1993 Letter of Interpretation	SAF-311, Bloodborne Pathogens Exposure Control Plan EHSO Biosafety Training Lab Rat Newsletter: Cleaning Up Biological Spills

3.18	Lab has adequately stocked biological spill kit in the lab area.	Lab staff should be properly equipped to clean up spills involving biological and infectious material. Keeping a fully stocked spill kit in your lab area prepares lab staff for future spills.	Labs can build their own spill kit with items commonly found in their lab and are not expected to purchase kits from lab supply vendors. Click here to read a Lab Rat article about cleaning biological spills.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Section IV 29 CFR 1910.1030 OSHA's Hazard Communication Standard Brief	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-310, Biosafety Manual
3.19	Mechanical pipetting devices are used. Mouth pipetting is prohibited.	When you pipette by mouth you are greatly increasing your risk of a gastrointestinal exposure versus if you pipet with a mechanical device.	Never pipette by mouth. Use pipet-aids or bulbs instead.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Section IV 29 CFR 1910.1030	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan
3.20	Biological and biohazard samples are placed in a durable, leak proof container during collection, handling, processing, storage, or transport within a facility.	To ensure that biological and infectious samples do not release into the environment/community or cause laboratory acquired infections.	Use tubes or containers that can be closed (ex: screw caps). Place tubes in secondary, leak-proof containers when transporting them within your facility. Use appropriate biological waste containers to collect waste.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section IV 29 CFR 1910.1030	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan

Biological Waste					
3.21	All biohazard waste is collected for decontamination prior to disposal. Examples of biohazard waste include: recombinant or synthetic nucleic acids, cultures, plates, transgenic animals/plants/arthropods, and sharps.	Biohazard or Biomedical waste must be collected and separated from other wastes generated in the laboratory to ensure proper decontamination in order to prevent release to the environment.	Biohazard waste can be collected in reusable containers or Stericycle boxes. Sharps must be collected and placed inside the sharps container. Once it is 3/4th full, the sharps container must be placed inside the Stericycle box. **Sharps must not be autoclaved and thrown into regular trash.** Go here for information on how to set up a Stericycle account.	Georgia's Environmental Protection Division (EPD) Rules: 391-3-4-15 Biomedical Waste amendment EPD Rules 391-3-4-.15 (2) (b) and (C) 29 CFR 1910.1030(d)(4)(iii)(c) 29 CFR 1910.1030(e)(2)(ii)(H) 29 CFR 1910.1030-(d)(4)(iii)(B)(1)(iii); 1910.1030(d)(4)(iii)(C)-Standard Interpretation-2009-06-02-2009	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan
3.22	Untreated biohazard waste is not poured down the drain, discarded in the regular trash, or mixed with chemical waste.	To protect the environment and the water supply, liquid biomedical waste must be treated prior to disposal into the sanitary sewer.	Add concentrated bleach to the liquid or semifluid waste. The amount of bleach added should be equal to 10% of the volume of the collected waste. Allow the bleach to remain in contact with the waste for at least 30 minutes. Treated liquid waste can be disposed of down the drain.	Georgia's Environmental Protection Division (EPD) Rules: 391-3-4-15 Biomedical Waste amended CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	

3.23	Vacuum lines are protected with liquid disinfectant traps, and traps are labeled as biohazard waste (with either the text or a biohazard label).	We need to be careful to not contaminate the building vacuum lines. The disinfectant overflow traps help us prevent vacuum contamination. They should be labeled so that everyone knows the hazard associated with the container.	If you need biohazard labels for your disinfectant traps, request them from your building liaison. Add a chemical disinfectant to the overflow vacuum flasks (ex: bleach). Tip: For work potentially contaminated with BBPs, OSHA requires that the vacuum lines be protected by HEPA filters that are checked and maintained routinely.	CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition Page 38 BSL 2 Lab facilities Page 322 shows how to set-up liquid disinfectant traps to protect vacuum lines. 29 CFR 1910.1030 (d) (4) (iii) [B] 29 CFR 1910.1030 (e)(2)(ii)(I) Special Practice	SAF-311, Bloodborne Pathogens Exposure Control Plan

3.24	Solid, non-sharps biological waste is collected in a durable, leak-proof biological waste container (i.e., Stericycle box, trash can) that is lined with a plastic bag. Biological waste container and plastic bag are both labeled with the biohazard symbol and the word "Biohazard."	Biohazard or biomedical waste must be collected and separated from other wastes generated in the laboratory to ensure proper decontamination in order to prevent release to the environment. Waste containers must have the strength to prevent ripping, tearing, or bursting during normal circumstances of use. For effective hazard communication, biohazard waste must be identified by the universal biohazard symbol.	Labs can use Stericycle boxes or purchase “flip-top” trash cans for storing/collecting biohazard waste. Stericycle boxes and other containers used to collect biohazard waste must be lined with a bag labeled with the universal biohazard symbol.	Georgia’s Environmental Protection Division (EPD) Rules: 391-3-4-15 Biomedical Waste amended CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	
3.25	Biohazard waste containers are closed except when adding waste.	Biohazard waste containers must be closed to minimize exposure to lab personnel. Biohazard waste containers must also prevent leakage or release of the contents during storage, handling, and transport.	Labs can purchase lids specifically designed to fit the Stericycle box. The lids are available through Emory’s Stericycle Representative in plastic or metal construction.	Georgia’s Environmental Protection Division (EPD) Rules: 391-3-4-15 Biomedical Waste amended CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	

3.26	Biohazard waste is sent for disposal through Stericycle. Stericycle boxes are packed, sealed, and stored properly outside the lab on the day of pick-up.	Untreated biohazard waste must not be disposed of in the landfill or general waste streams because infectious materials in the waste could lead to environmental contamination. Labs are strongly recommended to dispose of biohazard waste through Stericycle.	Go here for information on how to set up a Stericycle account. Go here to watch a video on how to pack biomedical waste for Stericycle disposal.	Georgia's Environmental Protection Division (EPD) Rules: 391-3-4-15 Biomedical Waste amended CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	
3.27	Infectious Waste Manifests from Stericycle are maintained for documentation and tracking. The Department of Transportation can come for unannounced inspections and verify these manifests for the previous three years.	Each time a Stericycle box is scanned, the Stericycle driver generates a receipt. The receipt serves documentation that a lab legally transferred the biohazardous waste to waste collector. If inspected by DOT, the lab must be able to prove that biohazardous waste generated was transferred to Stericycle.	Labs can choose the best method for maintain the waste manifests. Since the ink may fad over time, it may be best to have an electronic copy of the manifests. Tip: Storage examples include: scanning the waste manifests onto one of the lab's computers, using envelopes to store receipts, and taping the waste manifests to pages and keeping in a book or the Lab Safety Binder.	Department of Transportation Hazardous Materials Regulations: 49 CFR 172.205 Environmental Protection Agency's Hazardous Waste Generators Standard: 40 CFR 262, 40 CFR 263.22 CDC/NIH: Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	

	Item	What is the Safety Reason?	How Can I Comply?	Regulatory Sources	Institutional Document
RADIATION SAFETY					
			All Radioactive Labs		
4.1	Lab has current permit and authorization for ordering, working with, and/or storing radioactive materials.	The ability to know where and when radioactive material (RAM) is present provides awareness to create a safer environment for the public. Principal Investigators (PI) are required to submit an application for a permit in order to possess RAM. Applications require 4-6 weeks to process. Compliance ensures that Emory University meets the requirements for the RAM License issued by GA DNR/NRC. Permits identify authorized inventory, personnel and areas of use. The permit process requires radioactive postings that identify areas where RAM may be present.	All labs possessing or planning to obtain RAM must apply for an authorization permit.	Georgia DNR 391-3-17-.02(10)	RAD-030, Radiation Safety Manual

4.15	"Caution Radioactive Materials" and "Restricted Area" signs are posted at the lab entrance and on the lab bench/areas/equipment where radioactive material is used.	Posting a sign warns and prevents people from entering areas where RAM may be present.	RAM Areas should be identified and marked when the PI's permit is issued. If you have additional areas or changes to the designated lab areas you must submit an amendment form.	Georgia DNR 391-3-17-.03(12)(b)	RAD-030, Radiation Safety Manual
Inactive Rad Labs					
4.35	Geiger meters have been tagged out of service by EHSO.	Geiger meters for inactive labs to do not require annual calibration. By tagging your meter out of service, EHSO is ensuring its efficacy in the future. EHSO will remove the batteries which can corrode.	Let your building liaison know if your Geiger meter needs to be tagged out of service.		

Active Rad Labs					
4.3	Radioisotopes in use are listed on authorization permit.	The RAM permitting process is issued based on protocol submission which requests the use of radioisotopes. The use of radioisotopes not listed on the PI's permit is a failure to comply. The list of radioisotopes assists in establishing standards of protection against radiation for anyone that may come in contact. Using unauthorized isotopes could put the PI's permit and Emory University's license in jeopardy.	Only order isotopes approved on RAM permit issued to the PI. If additional isotopes are desired complete the amendment form.	Georgia DNR 391-3-17-.02(10)	RAD-030, Radiation Safety Manual

4.4	Personnel working with radioactive materials are identified on PI's authorization permit.	All lab personnel must be listed on PI's permit and complete training for safe handling and usage practices of RAM. Training assists the user in general safety and awareness. Additionally, knowledge of trained colleagues who can assist promotes safe practices.	Complete initial training as required to become authorized lab personnel. Renew additional training requirements prior to expiration. EHS-Assist lists authorized lab personnel with training dates. Submit amendments when lab workers are added or deleted to the PI's permit in a timely manner. Committee II amendments are required to remove or add workers to the PI's permit.	Georgia DNR 391-3-17-.02(10)	RAD-030, Radiation Safety Manual

4.5	All personnel listed on the radiation safety permit are up-to-date on their EHSO required Radiation Safety Training.	Training requirements will educate the RAM user on proper handling and usage instructions for safer working conditions.	Maintain and complete training courses as required prior to expiration dates. All authorized lab personnel can be found in EHS-Assist. To become an authorized lab personnel you must be listed on the PI's permit which is done by completing two initial training modules (part one is online and part two is a classroom session). Thereafter, a three Year Refresher Training, found online is required.	Georgia DNR 391-0-17-.02(10)(b)(3)(iii)	RAD-030, Radiation Safety Manual
4.6	The EHS Assist database reflects current inventory of radioactive materials stock vials, including record of volumes withdrawn from each stock vial.	Labs must maintain track of all RAM to prevent possible loss, theft or unauthorized use. Tracking of RAM inventory provides exposure data that helps comply with as low as reasonably achievable (ALARA) guidelines.	Lab must enter RAM usage in EHS-Assist on the actual day of use or enter it on the RAM Usage Log. RAM Usage Logs must be updated in EHS-Assist by Friday of each week. EH&S Assistant How To Guide	Georgia DNR 391-0-17-.02(10)(b)(3)	RAD-030, Radiation Safety Manual

4.7	The EHS Assist database reflects current inventory of radioactive waste containers, including record of activity discarded into each waste container.	Labs must maintain the record of all inventory disposed of in RAM waste containers. Proper disposal documentation complies with the Emory License agreement. Emory must maintain locations of all RAM in its possession to decrease unnecessary exposure.	Enter usage data on a weekly basis as required to make sure all inventory is present and accounted for. Lab must enter RAM usage in EHS-Assist on the actual day of use or document on the RAM Usage Log. RAM Usage Logs must be updated in EHS-Assist by Friday of each week. EH&S Assistant How To Guide	Georgia DNR 391-0-17-.02(10)(b)(3)	RAD-030, Radiation Safety Manual
4.8	Personnel know where to access their EHSO provided Radiation Safety Binder. Contamination surveys from previous three years are accessible for unscheduled inspection.	Labs must provide contamination surveys to demonstrate that all work areas are free of RAM contamination. External auditors can review records for the previous three years.	Make sure all personnel with authorization to use RAM know where the EHSO provided Radiation Safety Binder is stored and are knowledgeable to the location of the survey documentation.	Georgia DNR 391-0-17-.02(10)(b)(3)	RAD-030, Radiation Safety Manual
4.9	Area Geiger meter surveys and swipe tests are performed during the work weeks that radioactive materials are used.	Contamination must be found and identified so that it does not spread or result in unnecessary exposure to humans the public.	Complete and document Geiger meter surveys and swipe test results as required and store in Radiation Safety binder. Training covers Geiger Meter operations and swipe test instructions.	Georgia DNR 391-3-17-.03(8)	RAD-030, Radiation Safety Manual

4.10	Documentation of Geiger meter surveys includes the Geiger meter's model, serial number and calibration due date, date of the survey, and the initials of the person who performed the survey. The results are recorded in units of mR/hr and include a background reading.	Calibration ensures that the Geiger meter is working properly. The document is evidence that the contamination survey was completed and communicates the results to fellow lab workers.	Provide complete Geiger meter operability check information on weekly contamination surveys.	Georgia DNR 391-3-17-.03(14)(c)	RAD-030, Radiation Safety Manual
4.11	Documentation of swipe tests include a list or map of areas surveyed, model and manufacturer of counter used, date of test, and the initials of the individual who performed the test. The results are either recorded in units of dpm or in cpm with counter efficiency and include a background reading.	The purpose of documenting is to show that the activity was completed. Completing the contamination survey will determine the presence of RAM contamination in undesired areas, thereby reducing your exposure to RAM contamination.	Labs must print out liquid scintillation count (LSC) data and complete information on weekly surveys. Surveys are maintained for 3 years in the Radiation Safety binder.	Georgia DNR 391-3-17-.03(8) and (14)	RAD-030, Radiation Safety Manual

4.12	If removable contamination is found, lab attempts decontamination of contaminated areas. Lab repeats the contamination survey and documents the clean-up effort.	Cleaning RAM contamination will reduce exposure from RAM contamination in undesired areas.	The area shall be cleaned, resurveyed and documented to verify that the contamination is removed. Use a commercial cleanser and absorbent paper toweling to clean the area thoroughly. Dispose contaminated items in the RAM waste container for dry waste. Repeat the contamination survey until the area is free of contamination and document in Radiation Safety binder. If the lab is unable to remove the contamination, contact the building liaison for assistance.	Georgia DNR 391-3-17-.03(8)	RAD-030, Radiation Safety Manual

4.13	Acquisition of radioactive materials has not occurred without prior approval from EHSO. Radioactive shipments are either ordered through Emory Express and delivered by EHSO or labs complete and submit the Non-Emory Express RAM Acquisition Form to receive approval for any other type of acquisition (i.e. transferring radioactive materials between institutions or PI's, receiving direct shipments).	All orders of RAM must be approved by EHSO for safety. The Radiation Safety Officer is required to have an accurate accounting of all RAM on campus. It is important to make sure that Emory does not exceed license limits and that individuals are not unnecessarily exposed to radiation. Proper acquisition allows for inventory control within prescribed limits.	Ordering Radioactive Material (RAM) Guidelines	Georgia DNR 391-3-17-.02(10)(b)(3)(iii)(I)	RAD-030, Radiation Safety Manual
4.14	No unauthorized removal of radioactive material from a facility has occurred. All transport of radioactive materials between facilities is conducted by EHSO.	Department of transportation (DOT) training is required to transport RAM. The training educates the driver on proper transport procedures and the prevention of contamination to vehicles and property if an accident occurs.	If you need to transport between buildings, contact your building liaison. If the rooms inside the building are on your permit, you may transport the material yourself.	20 Georgia DNR 391-3-17-.03(11)(a) 49 CFR 172.704 49 CFR 177.801	RAD-030, Radiation Safety Manual

4.15	"Caution Radioactive Materials" and "Restricted Area" signs are posted at the lab entrance and on the lab bench/areas/equipment where radioactive material is used.	Posting a sign warns people entering areas where RAM may be present.	RAM areas should be identified and marked when the PI's permit is issued. If you have additional areas or changes to the designated lab areas you must contact your building liaison.	Georgia DNR 391-3-17-.03(12)(b)	RAD-030, Radiation Safety Manual
General Radiation Safety					
4.16	Use and storage of radioactive materials takes place in the authorized area.	Authorized areas are identified on the PI's permit to minimize where RAM is used. These areas undergo surveys to identify any potential contamination. Unauthorized areas should not be used as they have not been previously identified and could be missed on weekly survey.	Only use radioactive materials in approved areas as posted according to permit.	Georgia DNR 391-3-17-.03(11)	RAD-030, Radiation Safety Manual
4.17	Shielding is present and appropriate for type of radiation. Shielding reduces dose rate to 2 mR/hr or less at 30 cm from source or surface.	Shielding, used correctly, will prevent unnecessary or excessive exposure to radiation in areas where RAM is stored.	Use appropriate shielding for areas that reach the 2mR/hr limit.	Georgia DNR 391-3-17-.03(4)(b)	RAD-030, Radiation Safety Manual

4.18	CFH or glove box is used as required under permit conditions.	Use of certain isotopes may require a CFH or glove box to protect the worker from potential exposure.	Use CFH or glove box as required for the isotope in use and indicated under your permit conditions.	Georgia DNR 391-3-17-.03(10)	RAD-030, Radiation Safety Manual
4.19	Geiger meters have received an operability check within last year and are in good operating condition or marked out of service by EHSO.	Geiger meters must be calibrated annually and working properly to ensure the detection of radiation.	Check calibration sticker on Geiger meter to verify it has been calibrated annually as required. Battery checks should be conducted at each use. Contact your building liaison if you have an issue with the Geiger meter or if it is in need of calibration.	Georgia DNR 391-3-17-.03(14)(C)(1)	RAD-030, Radiation Safety Manual
4.20	Liquid scintillation fluid is non-hazardous (i.e., biodegradable, high flash point, or non-flammable). Examples of non-hazardous liquid scintillation fluid include Ecoscint (National Diagnostics), Opti-Fluor, (Perkin Elmer), Ultima Gold (Perkin Elmer), Scintiverse BD (Fisher) and ScintiSafe (Fisher).	Flammable liquid scintillation fluid exposes lab workers to unnecessary fire risks and potentially creates mixed waste for disposal.	All liquid scintillation fluid should be checked to make sure that it is non-flammable.	40 CFR 262.27 40 CFR 265.75(h)-(i)	RAD-030, Radiation Safety Manual

4.21	Radioactive material is secured against unauthorized access or removal. Methods include locking unattended laboratories, locking refrigerators or freezers in unrestricted areas or for shared refrigerators or freezers, securing in a lock box attached to the refrigerator or freezer.	All RAM must be kept secured from unauthorized personnel to reduce and prevent hazards associated with unnecessary exposure.	Acquire lock boxes from laboratory safety suppliers. Secure all RAM from loss and/or theft by storing it in locked equipment, a lock box or lab freezer, refrigerator or lock box. Document any and all inventory changes as they occur.	Georgia DNR 391-3-17-.03(11)	RAD-030, Radiation Safety Manual

Radioactive Waste					
4.22	The final destination for radioactive waste is EHSO.	EHSO ensures that RAM waste is disposed of properly. Proper disposal keeps RAM contamination out of the general waste stream. Labs should submit "Waste Pick-Up" requests when the waste is ready for disposal. Frequent turnover of waste prevents the RAM from creating radiation exposure to humans, unnecessarily. Best management practice is to dispose of waste containers as a project is completed or the isotope vial is empty.	Collect RAM waste in designated containers as required and properly prepare all containers to be collected by EHSO. All RAM waste must have EHS Assist Pick-Up Requests submitted for collections to occur. EH&S Assistant How To Guide	Georgia DNR 391-3-17-.06(5)(a)(1)(i)(VI)	RAD-030, Radiation Safety Manual

4.23	All radioactive waste is stored in EHSO provided radioactive waste containers.	Waste containers are provided by EHSO and properly marked for radioactive waste only. The intent is to reduce radioactive material from being improperly disposed in general waste streams.	Use EHSO approved waste containers. New containers can be requested in two ways. 1) Contact Environmental Compliance through chemwaste@emory.edu for new containers. 2) Complete the Waste Pick-up request in EHS-Assist and request additional containers for future use.	Georgia DNR 391-3-17-.06(7)(a)-(b)	RAD-030, Radiation Safety Manual
4.24	Radioactive waste is segregated by isotope and waste type (Dry, Liquid, or Liquid Scintillation Vial).	Waste streams should be segregated so they can be properly disposed of by EHSO. Mixing waste creates hazards for disposal and results in improper or poor shielding practices.	Segregate waste into properly designated containers by isotope and waste stream. Example: three waste containers should be used for H-3, one for H-3 liquid, one for H-3 dry and one for H-3 LSV (Liquid Scintillation Vials).	Georgia DNR 391-3-17-.03 (4)(b)	RAD-030, Radiation Safety Manual
4.25	Radioactive waste containers are labeled with a provided EHSO Radioactive Waste Label complete with PI's name, isotope, and EHS Assist Container number.	Labels provide waste details and create awareness for the container contents. Identification of contents helps provide information for proper disposal practices.	Complete attached waste labels as required. Waste labels are important to identify the isotope and waste type in waste containers (liquid, dry, LSV) during the collection process.	Georgia DNR 391-3-17-.03(12)(d)(1)	RAD-030, Radiation Safety Manual

4.26	All radioactive trefoils on vials or other containers are defaced prior to disposal into the radioactive waste container.	Defacing of vial/containers provides verification that the contents have been used and the contents are properly disposed of by EHSO.	Use a permanent marker to deface vials and other containers with radioactive trefoils.	Georgia DNR 391-3-17-.03(12)(d)(2)	RAD-030, Radiation Safety Manual
4.27	Radioactive waste is properly prepared for pick-up.	Completing the gold card identifies the isotope and dose rate from container contents. This provides safety information needed to transport the waste and protect waste collectors during transportation.	Complete gold radioactive cards on waste containers and print “Waste Pick-up” request report from EH&S-Assist. Follow the instructions included in the “Waste Pick-Up” report for details. Labs are encouraged to keep a copy of pick-up requests for records. EH&S Assistant How To Guide	Georgia DNR 391-3-17.06(5)(a)(1)(II) 49 CFR 172.101 Appendix A, Table 2	RAD-030, Radiation Safety Manual
4.28	Radioactive waste is not disposed of via sewer without authorization and documentation. Sewer disposal is not in excess of authorized limits.	Water, pipes and sinks do not become unnecessarily contaminated if proper disposal methods are used. Proper disposal complies with the criteria in the Emory License agreement.	Collect all RAM liquid in designated containers. Do not dispose of any liquids down the drain without prior approval from EHSO.	Georgia DNR 391-3-17-.03(13)(1)(iii)	RAD-030, Radiation Safety Manual

4.29	Labels (e.g., white I, yellow II) on shipping boxes used for receiving radioactive materials are defaced prior to disposal through housekeeping.	The defacing practice notifies housekeeping that the contents have been removed from shipping containers and that the box can be disposed into the general waste stream.	After removing RAM from the shipping container, deface all radioactive trefoils on the shipping container and dispose the container in general waste.	Georgia DNR 391-3-17-.03(12)(d)(2)	RAD-030, Radiation Safety Manual
Dosimetry					
4.30	Personal dosimetry badges and control badges are stored away from radioactive materials.	Safety benefits are negated due to inaccurate data from badges that are stored incorrectly.	Properly store dosimetry badges away from sources of radiation. Wear badges as required when working on RAM projects. Control badges must be stored away from sources of radiation at all times to have correct background exposure data. Examples for safe storage include: desk drawers and /or lead pigs.	Georgia DNR 391-3-.03(1)(a) Landauer Luxel Service Guide, pp. 10	RAD-030, Radiation Safety Manual

4.31	Personnel wear badges properly when handling radioactive material.	Dosimetry badges monitor the exposure to RAM. If the badge is worn improperly the exposure levels will not be properly reported. The goal is to track exposure to verify if levels of exposure should exceed acceptable levels. To assess your safety, accurate exposure readings are necessary and they are achieved by wearing the badges correctly.	How to wear dosimetry: Whole Body Badge: Collar to waist for whole body badge. Ring Badge: Dominant hand with label facing toward source of radiation for ring badges.	Georgia DNR 391-3-17-.03(8)(a)(4) Landauer Luxel Service Guide, pp. 7	RAD-030, Radiation Safety Manual
4.32	Labs contact EHSO to be issued an air sampler prior to conducting an experiment with 1mCi or more of Iodine.	Utilizing an air sampler enables EHSO to provide exposure measurements of hazardous volatile compounds. Monitoring provides data so that proper precautions can be taken for a safe working environment.	Contact your building liaison to have an air sampler issued for testing.	Georgia DNR 391-3-17-.03(10)(d)(iii)(II)	RAD-030, Radiation Safety Manual

4.33	Personnel conducting experiments with 1 mCi or more of I-125 or I-131 or more than 8 mCi of H-3 in past year have contacted EHSO to schedule a bioassay.	Lab workers need to be properly evaluated and monitored for uptake when using high levels of these isotopes to ensure that lab personnel are not being over exposed to radiation.	Contact your designated building liaison to schedule a bioassay.	Georgia DNR 391-3-17-.03(5)(1)(d)(iv)(2) 391-3-17-.03(10)(d)(1)(iii)(II)	RAD-030, Radiation Safety Manual
4.34	Personnel radioactive exposure records are stored in the lab's Radiation Safety Binder.	Employees need to have information regarding their exposure readings so they can take proper precautions to reduce them.	Store all radiation exposure records in the Radiation Safety binder.	Georgia DNR 391-3-17-.03(14)(g)	Radiation Safety Manual

	Item	What is the Safety Reason?	How Can I Comply?	Regulatory Sources	Institutional Document
LASER SAFETY **Administrative Controls for Class 3B & Class 4 Lasers**					
5.1	All laser operators (including operators of confocal microscopes) have been trained on the SOPs specific to the operation of the laser equipment in the lab. Written SOPs are available for the operation of: • Class 3B lasers • Class 4 Lasers	All personnel who operate Class 3B or Class 4 lasers must be familiar with the appropriate method(s) of operating the equipment to avoid injuries to themselves or others.	Conduct training exercises with all operators under the direct supervision of the PI or lab manager prior to independent use. Make written standard operating procedures and user manuals available to all laser operators. A Laser Standard Operating Procedures Template is available at ehso.emory.edu. All laser operators should sign a document stating that they understand the SOPs.	ANSI Z136.1 – 2014, section 4.4.1 and 5.5 ANSI Z136.1 - 2014, 1.3.1. General. ANSI Z136.1 - 2014, 1.3.2 ANSI Z136.1 - 2014, 4.4.3. ANSI Z136.1 - 2014, Appendix A. Prudent Practices in the Laboratory	SAF-367, Laser Safety Program

5.2	The presence of Class 3B and Class 4 lasers is indicated on the external lab signage.	Individuals entering the laser work area must be informed that lasers, that have the potential to cause injury, are inside.	Register all Class 3B and Class 4 laser devices with EHSO. When completing your Lab Signage requirements form for external lab signage, indicate the presence of Class 3B and/or Class 4 lasers. To request a new sign or an update to an existing sign, complete the Lab Signage Requirements Form and email it to labsign@emory.edu.	ANSI Z136.1 – 2014, 4.6 ANSI Z136.1 - 2014, Appendix A.	SAF-367, Laser Safety Program
5.3	A laser “warning” indicator (i.e. flashing lights, signs, etc.) is visible outside of the lab when the laser(s) is in use.	A laser warning indicator such as a flashing light or illuminated sign alerts individuals who are entering the laser work area that the laser(s) beyond the entrance are in operation.	Contact EHSO at 404-727-5922 for more information.	ANSI Z136.1 – 2014, 4.4.2.9.1	SAF-367, Laser Safety Program

5.4	All Class 3B and Class 4 lasers have been registered with EHSO.	EHSO must be aware of the location of all Class 3B and Class 4 lasers due to their potential to cause physical injury in operators. This is required in the Emory University Laser Safety Program.	Complete the Laser Registration Form with all applicable information and submit to linspec@emory.edu.	ANSI Z136.1 - 2014, 1.3.2	SAF-367, Laser Safety Program
5.5	A current laser device inventory for: • Class 3B • Class 4 lasers	This inventory must be kept in the lab so that the laser specifications can be identified for each laser in the event of an injury.	Ensure that at a minimum all user manuals for laser devices are kept and are accessible. (Information includes but is not limited to manufacturer, model number, serial number, wavelength, active medium, average power, peak power, mode, etc.).	ANSI Z136.1 - 2014, 1.3.2	SAF-367, Laser Safety Program
Work Practices/Engineering Controls for Class 3B & Class 4 Lasers					
5.6	Lasers in the work area are securely mounted on a sturdy surface at a level above or below eye level (not at eye level).	Lasers that are mounted at eye level have a greater potential to cause injuries to the eyes.	Ensure that lasers are mounted on a sturdy surface that is either above eye level or below eye level (to be considered even when the operator is sitting).	ANSI Z136.1 – 2014 4.4.3.5.1	SAF-367, Laser Safety Program

5.7	Work surfaces where lasers are positioned are kept free of water and/or moisture.	Lasers have electrical components that can increase the potential for electrical shock or electrocution when wet.	Make sure that surfaces where lasers are positioned are kept free of water and/or moisture by immediately cleaning any spills that occur.	ANSI Z136.1 - 2014 7.2.1	SAF-367, Laser Safety Program
5.8	Doors to the laser work areas are closed and locked when the lab is vacant to prevent unauthorized entry.	Class 3B and Class 4 lasers, when operated by untrained individuals, can cause severe injuries up to and including death.	Keep doors locked or render laser devices inoperable when the lab is left unattended.	ANSI Z136.1 – 2014 4.4.3	SAF-367, Laser Safety Program
5.9	Windows (and viewing windows built into doors) are completely covered with dark, non-penetrable materials.	Laser beams from Class 3B and Class 4 lasers can injure individuals even at long distances. Windows do not block laser beams.	Ensure that all laser beams are terminated with an appropriate beam block or barrier to prevent progression of a laser beam in the direction of windows, and insure that an appropriate, non-flammable material (examples: acrylic, polycarbonate) is used to cover windows and viewing windows of doors to prevent the laser beam from going beyond the laser work area.	ANSI Z136.1 – 2014 4.4.3.5.1	SAF-367, Laser Safety Program

5.10	Reflective surfaces (hanging mirrors, jewelry, etc.) are not present in the laser work area.	Laser light has excellent reflective properties. Stray reflections from laser light interacting mirrors or jewelry can produce the same level of injury to the eyes or skin as it would directly from the source. This depends on the power of the laser and the type of reflection.	Avoid having unnecessary reflective surfaces such as mirrors or jewelry in the laser work area.	ANSI Z136.1 – 2014 4.4.3.5.1	SAF-367, Laser Safety Program
5.11	If required by hazard analysis, point source ventilation/local exhaust is available. (Mark N/A if not required)	Exhaust ventilation at the source (point source ventilation) should be used to prevent exposure in the event that laser generated air contaminants are produced during a process.	Use a form of point source ventilation (snorkel exhaust) at the source(s) where laser generated air contaminants is emitted from the burning of materials by the laser.	ANSI Z136.1 - 2014 7.3.4.1	SAF-367, Laser Safety Program
5.12	All laser devices are equipped with a protective housing.	Required by the Federal Laser Product Performance Standard (FLPPS), the protective housing protects all of the inner components of the laser. In some cases, it encloses the laser energy/laser beams entirely.	Ensure that the protective housing remains in place during normal operations unless the equipment is being serviced, or unless the research requires it.	21 CFR 1040.10 (f) ANSI Z136.1 - 2014 4.4.2.1 ANSI Z136.1 – 2014 4.4.2.1.1	SAF-367, Laser Safety Program

5.13	All laser devices have interlock systems that can be activated in the event the protective housing is removed.	Required by the Federal Laser Product Performance Standard (FLPPS) all removable protective housings on Class 3B and Class 4 lasers must have an interlock system in place that is designed to prevent access to laser radiation above the applicable maximum permissible exposure (MPE) in the event that the protective housing is removed.	Check that the laser equipment has this interlock system in place. If it does not, one must be installed.	ANZI Z136.1 – 2014 4.4.2.1.3 21 CFR 1040.10 (f)(2) 21 CFR 1040.10 (f)(3) Prudent Practices in the Laboratory 6.C.2.1	SAF-367, Laser Safety Program
5.14	Shutters and filters on laser equipment are used (if available) to minimize laser radiation levels.	These devices are used during laser operation to reduce/minimize laser radiation during normal operation.	If available, use shutters and filters to reduce the laser output when the full power of the laser is not needed.	ANZI Z136.1 – 2014 4.4.2.1.3 21 CFR 1040.10 (f)(8)(i)	SAF-367, Laser Safety Program
5.15	Laser beam paths are enclosed, if feasible. (Mark N/A if not feasible)	Laser beam enclosures greatly decrease the chance that someone will sustain an eye or skin injury during normal laser operation.	Use beam enclosures, beam tubes, or other appropriate enclosures to prevent eye and skin exposure.	ANSI Z136.1 – 2014 4.4.2.7.3	SAF-367, Laser Safety Program

5.16	The operational key switch is removed or the computer is locked with a password (when lab is vacant) to prevent unauthorized use of laser equipment.	Only trained, authorized personnel should be operating Class 3B or Class 4 lasers. Removing the key or requiring a valid computer password will prevent unauthorized personnel from operating the laser devices.	When the lab is vacant or unattended, remove the key switch or lock the associated computer to prevent unauthorized use.	ANSI Z136.1 – 2014 4.4.2.2 Prudent Practices in Laboratory 7.C.8.1	SAF-367, Laser Safety Program
5.17	Beam stops or beam dumps are used to terminate the path of the beam(s).	Open laser beams from Class 3B or Class 4 lasers that do not have a defined termination point can cause injuries, even at long distances. In some instances, the laser output of the beam may be needed, but not momentarily. In this case, the beam block/attenuator should also be used.	Use appropriate beam blocks/beam dumps to terminate the path of the beam to prevent stray beams, or when the laser output is not needed immediately.	ANSI Z136.1 – 2014 4.4.3.5.1	SAF-367, Laser Safety Program

5.18	The laser is equipped with a clearly visible "power-on" indicator.	Class 3B and Class 4 lasers need either a visible or audible indicator to alert operators that the laser is operational. This lets personnel who are entering the lab/work area, know to follow all necessary control measures, such as donning eye protection prior to entry.	This should be incorporated in all laser devices by design.	21 CFR 1040.10(f)(5)(ii) Prudent Practices in the Laboratory, 4.E.7	SAF-367, Laser Safety Program
5.19	All laser equipment is well grounded.	Laser devices have electrical components that can cause shock or electrocution.	Ensure that all laser equipment is connected to properly installed circuit breakers, ground fault circuit interrupters, etc.	ANSI Z136.1 – 2014 7.2.1.1 Prudent Practices in the Laboratory, 4.E.7	SAF-367, Laser Safety Program
5.20	Electrical safety devices are available and used (circuit breakers, ground fault circuit interrupters, etc.).	Some lasers, particularly Class 4 lasers, are high voltage devices. These power sources need the option to be shut down immediately in the event of an accident.	Ensure that all laser equipment is connected to properly installed circuit breakers, ground fault circuit interrupters, etc.	ANSI Z136.1 – 2014 7.2.1.4 Prudent Practices in the Laboratory, 4.E.7	SAF-367, Laser Safety Program
5.21	All laser equipment is de-energized during servicing or repair.	Making contact with energized electrical equipment can cause electrical shock, electrocution, or death.	Ensure that all laser equipment is disconnected from all electrical outlets prior to working on the equipment.	ANSI Z136.1 – 2014 7.2.1.6	SAF-367, Laser Safety Program

Class 4 Lasers Additional Controls					
5.22	Remote operation is available and used when enclosure of the beam(s) is not feasible.	With high power Class 4 lasers, working at safe distances from the laser (when possible) will decrease the chance that a laser operator will become injured.	When possible, work outside of the nominal hazard zone (NHZ, which is the area where the laser radiation is no longer considered hazardous), or behind laser rated shielding.	ANSI Z136.1 – 2014 4.4.3.5.2.1	SAF-367, Laser Safety Program
5.23	Tightly woven fabrics or other protective clothing (lab coats) are worn during operation of laser equipment (UV lasers).	Repeated exposure to lasers radiation in the ultraviolet region of the electromagnetic spectrum can cause adverse effect in the skin from sunburn to skin cancer, depending on the frequency of occurrence.	Wear protective equipment such as lab coats to cover exposed skin while working with UV lasers.	ANSI Z136.1 – 2014 4.4.4.3 Prudent Practices in the Laboratory, Section 7.C.8.1	SAF-367, Laser Safety Program
5.24	Flame retardant clothing is worn (as necessary) while using high powered Class 4 lasers.	Some lasers have output power that is sufficient to ignite clothing, which can lead to serious injury or death.	When working in close proximity with a laser that is a fire hazard, wear a flame retardant lab coat.	ANSI Z136.1 – 2014 4.4.4.3 Prudent Practices in the Laboratory, 7.C.8.1	SAF-367, Laser Safety Program

PPE for Class 3B & Class 4 Lasers					
5.25	All laser operators wear laser eye protection equipped with side shield (appropriate for the wavelength and optical density) in the presence of open laser beam paths (laser radiation is accessible). Each pair of laser eye protection is labeled (from the manufacturer) with the optical density and wavelength for which protection is provided.	Eye exposure to laser radiation can cause minor to major damage, depending on the laser, electromagnetic wavelength, output power, and time of exposure.	Ensure that laser eye protection is worn for all laser devices that are not completely enclosed while in operation. The LEP must meet requirements for appropriate wavelength and optical density. If uncertain whether you are using appropriate eye protection, contact EHSO at 404-727-5922.	ANSI Z136.1 – 2014, 4.4.4.2.1 29 CFR 1926.102(b)(2) Prudent Practices in the Laboratory, 4.E.5	SAF-367, Laser Safety Program
5.26	Each pair of eye protection is stored in individual protective cases and inspected periodically for cracks, scratches, and breaks. Damaged eye protection is discontinued from use and discarded or replaced. Each pair of eye protection is cleaned, when necessary, using only mild soap and water (solvents can damage the filters).	Laser eye protection that has scratches or scuffs, or has filters that have been weakened from cleaning with solvents, may allow laser radiation to penetrate the lenses, causing eye injury.	Keep eye protection stored in protective cases, and only clean the lenses with mild soap and water.	ANSI Z136.1 – 2014 4.4.4.2.7 Prudent Practices in the Laboratory, 4.E.5	SAF-367, Laser Safety Program

	Item	What is the Safety Reason?	How Can I Comply?	Regulatory Sources	Institutional Document
PERSONAL PROTECTIVE EQUIPMENT					
			Assessment		
6.1	Personal Protective Equipment (PPE) Assessment Form (for Research Laboratories) has been completed, signed by all lab personnel, and maintained in the Lab Safety Binder.	PPE is special gear used to protect workers from specific hazards. The selection of PPE depends upon the type of operations being performed and the nature and quantity of the materials in use. Thus, it must be assessed on a case-by-case basis.	Download the Personal Protective Equipment (PPE) Assessment Form (for Research Laboratories) and complete to determine the appropriate PPE for lab members. Have lab personnel sign off on the PPE assessment to ensure understanding of appropriate PPE depending upon specific research activities.	29CFR1910.1030(d)(3)(ii) 29 CFR 1910.132(d)(1)(i) 29 CFR 1910.132(d)(2) 29 CFR 1910.1450 Appendix A (1) OSHA 3151 Pages 6-8	SAF-351, Chemical Hygiene Plan
			Gloves		
6.2	Gloves are worn and are appropriate for the associated hazard.	Gloves are designed to protect hands from a particular set of hazards. For instance, nitrile gloves protect against most chemicals and infectious agents, but intentional contact with ketones, oxidizing acids and organic compounds containing	The PPE hazard assessment will help you to determine the appropriate type of gloves to wear based upon your research activities.	29CFR 1910.138(a) 29CFR 1910.138(b) 1910.1030(d)(3)(ix) 1910.1450 Appendix A (2) Biosafety in Microbiological and Biomedical Laboratories,	SAF-351, Chemical Hygiene Plan SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-370, Personal

		nitrogen should be avoided		5th Edition, Section IV (C)(4) Prudent Practices pg 230 (k)	Protective Equipment (PPE) Guidelines
6.3	There are alternatives to Latex gloves available.	Many people are allergic or develop allergies to latex.	Nitrile gloves are an example of a good alternative to latex gloves.	29CFR1910.1030(d)(3)(iii) Biosafety in Microbiological and Biomedical Laboratories, 5th Edition	SAF-311, Bloodborne Pathogens Exposure Control Plan
6.4	Gloves are changed when they become contaminated or ripped.	Gloves reduce the chance of skin contamination but do not provide absolute protection. Many chemicals can quickly pass through or damage disposable gloves. Disposable gloves should be replaced when their ability to function as a barrier is compromised.	Change gloves after any splash or spill. Check gloves periodically for tears and breaks and change gloves if discovered.	29CFR 1910.1030 (d)(3)(ix)(A) Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section IV (C)(4)(a)	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-370, Personal Protective Equipment (PPE) Guidelines
6.5	Gloves are removed before leaving the lab.	Removing gloves when leaving areas where hazardous materials may have contaminated them is critical to prevent the spread of contamination.	Keep your lab door closed and do not touch that knob with gloved hands!	29CFR 1910.1030 (d)(3)(vii) ALARA GA 391-3-17-.03 (4)(b) Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section IV (C)(4)(b)	SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-370, Personal Protective Equipment

					(PPE) Guidelines
6.6	Disposable gloves are not washed or re-used.	Reusing disposable gloves actually defeats the purpose of using them as protective barriers. Gloves may be damaged beyond manufacturer's intended design. Reuse of contaminated disposable gloves increases your chances of exposure and the spread of contaminants in the laboratory.	Dispose of gloves with other contaminated waste immediately after removal.	29CFR 1910.1030 (d)(3)(ix)(B) Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section IV (C)(4)(c)	SAF-311, Bloodborne Pathogens Exposure Control Plan
Eye					
6.8/ 6.9/ 6.10	The lab should have the following eye protection based on the PPE assessment: • Safety Glasses • Safety Goggles • Face Shields	Safety glasses have lenses that are impact resistant and frames that are far stronger than standard glasses. Safety goggles are impact resistant and protect the eyes from splashes. Face shields protect a larger area of the face from splashes and flying particles and should be used when working with large	Store your glasses in the same place every day. Put them on before you go to the bench. Have a designated place to store safety googles/face shields for the lab. Always return safety googles/face shields to the designated place so that everyone knows where they can be found.	29CFR 1910.133(a)(2) 29CFR 1910.133(a)(3) 29CFR 1910.133(b)(1) 29CFR 1910.133(b)(1)(i) 29CFR 1910.1450(a)(2)(ii) 29CFR 1910.1030(d)(3)(x) Biosafety in Microbiological and	SAF-351, Chemical Hygiene Plan SAF-370, Personal Protective Equipment (PPE) Guidelines

		volumes of hazardous materials and should be worn with safety glasses/goggles.	For toolbox training on eye safety, click here.	Biomedical Laboratories, 5th edition Section IV (C)(3)	
Clothing					
6.13	Closed toed shoes and long pants/skirts are worn at all times when inside the lab.	Long pants/skirts will protect areas of the skin not covered by your lab coat. Closed toed shoes protect your feet from spills or broken glass.	If you find lab-appropriate clothing too hot in the summer, keep a pair of long pants and closed toed shoes in your lab so you can change from your shorts and flip flops when you get to work.	29CFR 1910.136(a)	SAF-351, Chemical Hygiene Plan SAF-370, Personal Protective Equipment (PPE) Guidelines
6.12	Lab coats and other appropriate protective clothing (i.e., shoe covers and gowns) are available in the lab and are worn while conducting laboratory experiments.	Lab coats are PPE and should be worn in the lab to protect the skin and clothing from splatter and spills. Lab coats cover your regular clothes to minimize non-obvious contamination, splash hazards and impede saturation of regular clothes or skin from exposures to harmful substances. Although, most lab coats are not designed to be impermeable to hazardous substances or flameproof, they provide additional safety because they	The PPE assessment will help you to determine the appropriate type of protective clothing to wear based upon your research activities. Click here to read a Lab Rat article about PPE.	29CFR 1910.1030(d)(3)(xi) 29CFR 1910.1450(a)(2)(ii) Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, Section IV (C)(2)	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan SAF-370, Personal Protective Equipment (PPE) Guidelines

		can be quickly removed to isolate harmful exposures or flames.			
6.18	Lab coats are laundered by an Emory approved vendor. They are not cleaned inside the lab, at home or at a commercial laundry mat or dry cleaner.	Lab coats should be cleaned and/or decontaminated by professionals who have been informed of the potential hazards and are trained to reduce exposure to themselves and the environment. Cleaning lab coats at home could result in the contamination of your family's clothing.	Click here for more information on how to set up an account to have your lab coats laundered through an Emory approved vendor.	29 CFR 1910.1030 (d) (3) (iv)	SAF-310, Biosafety Manual SAF-311, Bloodborne Pathogens Exposure Control Plan
Hearing					
6.14	Hearing protection is worn when working in loud areas.	Excessive noise exposure is the most common cause of hearing loss (i.e. an average greater than 85 dBA over an 8 hour period). Hearing protection decreases the intensity of sound that reaches the eardrum and can help to prevent further hearing loss. Earplugs and earmuffs are two forms of hearing protection. Properly fitted earplugs or muffs	If you have to raise your voice for someone standing nearby to hear you, consider the area you are working in or the activity you are performing 'loud' and wear hearing protection while in the area or engaged in the activity.	29CFR 1910.95 (b)(1)	SAF-366, Hearing Conservation Program

		reduce noise 15-30 dB.			
6.15	If personnel are wearing hearing protection, lab has requested noise monitoring from EHSO.	Depending upon results of noise monitoring, personnel may be enrolled in SAF-366, Hearing Conservation Program.	For noise monitoring, please contact indhyg@emory.edu	29CFR 1910.95(d)	SAF-366, Hearing Conservation Program
Respiratory					
6.16	• If required by EHSO based on a risk assessment, respiratory protection (i.e., N95, cartridge respirator, PAPR) is available in the lab and worn. • Reusable respirators are regularly cleaned, disinfected, inspected, and stored appropriately. • Medical clearance, fit testing, and training for respirator use is renewed annually.	A respirator is a protective face piece, hood or helmet that is designed to protect the wearer against a variety of harmful airborne agents. Respirators are required to protect employees from breathing contaminated air when effective engineering controls are not feasible or while they are being instituted. As part of the Respiratory Protection Program, those required to wear respirators must receive annual medical clearance, fit testing, and training on the use and care of respirators.	For information concerning Emory's Respirator Protection Program, click here. For medical clearance, schedule an appointment with Occupational Health. Be prepared with which respirator you will be fit tested for (e.g. N95, cartridge), your department name and smart key #. Respiratory Protection Training is offered online. For disposable N95 masks, take "EHSO-Respiratory Protection for Single-Use Respirators" in the ELMS. (The ELMS course code is 242181.) For cartridge	29CFR 1910.134(c)(1)(i)-(viii) 29CFR 1910.134(c)(4) 29CFR 1910.134(d) (1) 29CFR 1910.134(e); 29CFR 1910.134(f); 29CFR 1910.134(k)	SAF-371, Respiratory Protection Program

			respirators, take "EHSO-Respiratory Protection for University Workers" in the ELMS. (The ELMS course code is 240180.) Instructions for enrolling in ELMS may be found here. Upon completion of training and medical clearance, contact Industrial Hygiene (indhyg@emory.edu) to schedule a time for fit testing. If being fit tested for a cartridge respirator, you must bring the appropriate cartridges with you.		
6.17	If personnel are wearing respirators voluntarily, they have read and signed "Information for Employees Using Respirators When Not Required Under Standard", Appendix D.	If a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Read Appendix D to see a list of precautions to take to be sure that the respirator itself does not present a hazard.	Click here to read Appendix D- according to the respirator program, there is a voluntary use form that needs to be completed and emailed to EHSO. Complete and submit Voluntary Use of respirator	29CFR 1910.134(c)(2) 29CFR 1910.134(c)(2)(i)	SAF-371, Respiratory Protection Program

Decontamination/ Disposal					
6.7/ 6.11	• Reusable PPE must be decontaminated after each use until it needs to be disposed of. • Disposable PPE must be disposed of after use.	Reusable PPE is designed to be robust and survive the appropriate means of decontamination multiple times. However, there is a finite number of times decontamination can occur before degradation compromises the integrity of the PPE. Disposable PPE is not designed to survive such conditions and will be destroyed upon trying to. It is also important to know the wear time for disposable PPE because even the act of use can cause micro-tearing, which will eventually lead to breach.	Decontaminate with proper disinfectants (i.e. 70% ethanol, soap and water, etc.). Dispose of through proper waste streams.	29CFR 1910.1030(d)(3)(viii)	SAF-351, Chemical Hygiene Plan SAF-370, Personal Protective Equipment (PPE) Guidelines SAF-311, Bloodborne Pathogens Exposure Control Plan

	Item	What is the Safety Reason?	How Can I Comply?	Regulatory Sources	Institutional Document
EMERGENCY					
			Fire Safety		
7.1	A visual inspection of each fire extinguisher inside the lab is conducted by lab personnel and documented on the card attached to the fire extinguisher monthly.	Fire extinguishers are present in the lab to prevent incipient stage fires from becoming serious. Lab personnel must check fire extinguishers on a monthly basis to verify the extinguisher is ready for use.	Click here to read a Lab Rat article on how to conduct monthly fire extinguisher inspections.	29 CFR 1910.157 (e) (2) 29 CFR 1910.155 (c) (27) OSHA LoI 11.29.2006 NFPA 10 (7.2.1) 2013	
7.2	Personnel know where the fire extinguisher is located and it is not obstructed.	Fire extinguishers must be readily accessible in the event of a fire. Furniture and other items in the lab must be arranged to allow clear visibility and access. All personnel in the lab must be aware of the location of the fire extinguisher.	Labs can utilize the Principal Investigator's Guide to Environmental Health and Safety (EHS) Policies and Procedures for Employees to ensure that lab personnel know the location of the lab's emergency equipment.	29 CFR 1910.157 (c) (1) NFPA 10 (6.1.3) 2013 NFPA 10 (6.1.3) 2013 NFPA 10 (6.1.3.3)	SAF-351, Chemical Hygiene Plan

7.3	There is no storage within an 18” horizontal plane from the ceiling (except along the walls) such that the spray from the sprinkler head is not obstructed when activated.	When activated, the sprinkler heads release water in a cone-shaped arc. The water released from neighboring sprinkler heads must be able to overlap. To effectively contain a fire, the space between sprinklers must be clear in order for the water to overlap.	Labs should store items below the 18 inches horizontal plane throughout the room or storage area. Items stored on shelves that are mounted along the walls of the lab are exempt. These storage areas are not expected to interfere with discharge from the sprinklers.	29 CFR 1910.159(c)(10) OSHA LoI 09.29.2008	
7.4	Exits, aisles, and hallways inside of the lab are free of obstructions so that there is a route of egress from the lab at least 36” wide.	The route of egress must be free of obstructions to ensure that personnel can evacuate the building and arrive safely to the designated meeting location.	Visually inspect the aisles, walkways, and hallways within and outside of the lab. If equipment or furniture is stored in one of the above locations, the clearance for walking space should be at least 36 inches.	29 CFR 1910.37 (a) (3) 29 CFR 1910.36 (g) (2) NFPA 101 (7.3.4.1) 2015 IBC 1021.2	
7.5	Labs know where the evacuation routes are posted and are familiar with evacuation procedures.	In the event of an emergency, personnel must be able to locate a primary and alternate exit route from the work area. To facilitate emergency egress, evacuation routes are posted near the elevators and stairwells in most research buildings.	Labs can utilize the Principal Investigator's Guide to Environmental Health and Safety (EHS) Policies and Procedures for Employees to ensure that lab personnel know the location of the evacuation routes for the lab.	29 CFR 1910.38 (b) 29 CFR 1910.38 (c)(2) NFPA 101 4.5.3.3	

Emergency Procedures					
7.6	Personnel in the lab know how to formally report accidents and injuries in PeopleSoft after first aid/medical care has been received.	Personal injuries that occur in the workplace must be formally reported through PeopleSoft. The formal reporting process must be completed even if medical treatment was not received. If medical treatment is received following a workplace injury and it is not reported; the cost of medical treatment may not be covered.	Labs can utilize the Principal Investigator's Guide to Environmental Health and Safety (EHS) Policies and Procedures for Employees and the "Just In Time Guide" to ensure that lab personnel know the procedures for reporting work place injuries. Lab personnel can also visit the EHSO website for direct link to the Incident Report form.	29 CFR 1904.7	

7.7	All personnel know to dial Emory Police (404-727-6111) in the event of an emergency.	In the event of an emergency, lab personnel should know how to reach Emory Police versus DeKalb County Fire and Rescue.	Labs can utilize the Principal Investigator's Guide to Environmental Health and Safety (EHS) Policies and Procedures for Employees and the "Just In Time Guide" to ensure that lab personnel know the procedures for emergency procedures. Emergency procedures may vary depending on the location of the research building. Laboratories with research space in more than one building/location should be familiar with the applicable emergency procedures.	29 CFR 1910.38 (C) 1	
7.8	Spills and accidents involving recombinant/synthetic nucleic acid molecules are immediately reported to the Biosafety Officer so that EHSO can report the incident to the NIH.	When there is an incident involving a gene product (plasmid, vector, and transgenic animal) it must be reported to NIH within 24 hours of occurrence.	Lab personnel can also visit the EHSO website for direct link to the Accident/Injury Report form.	NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules sections IV-B-7-a-(3) and Appendix G-II-B-2-k.	

Emergency Equipment					
7.9	The eyewash in the lab is tested and documented at least monthly. For supplemental eyewash bottles, this means contacting EHSO to replace expired bottles of solution.	Eyewash stations must be tested at least once a month to ensure the water quality, pressure, and temperature is adequate for decontamination.	Click here for the Eyewash Inspection Record. Post this near each eyewash station and use it to document your monthly tests. If your supplemental eyewash bottle is expired, contact your building liaison so they can provide you with a refill bottle.	ANSI Z358.1-2014 sections 5.5.2, 6.5.2, 8.2.4.2, Appendix B(B7) 29 CFR 1910.1450 - Appendix A D-4 29 CFR 1910.1030(e)(3)(i)	SAF-351, Chemical Hygiene Plan SAF-311, Bloodborne Pathogens Exposure Control Plan
7.10	Double ocular and single ocular eyewashes have protective caps in place.	Protective caps must be in place to prevent the eyewash drench hose from becoming contaminated.	Ensure that protective caps are in place. If protective caps are missing, then the lab can request additional caps from Campus Services. The lab will need to submit a work order for this request.	ANSI Z358.1 sections 5.1.3, 6.1.3	
7.11	Eyewash and safety shower are available and free of obstruction.	At the time of an exposure, time is of the essence. Emergency equipment must be readily accessible in the event that it must be used.	Visually inspect the location of the eyewash and emergency shower within the lab. Remove or relocate any items that can obstruct access to the eyewash or emergency shower.	ANSI Z358.1 sections 4.5.2, 5.4.2, 6.4.2, Appendix B (B5)	