

Guide to CSB/SJU Laboratory Safety Inspection Form

The following briefly describes what to look for during a typical laboratory inspection for our general teaching laboratories on both campuses.

General Safety

- Door signs list laboratory personnel names and phone numbers, as well as special hazards.
The names and phone numbers (office and home) of the principal faculty member(s) and other knowledgeable employees/students should be listed on the front of the sign and the appropriate hazards checked on the front or back of the sign. The sign should be posted either near the door, or on the door, in a way that emergency personnel can access the hazard information.
- Door signs have current information. All door signs should be checked for accuracy on a yearly basis and should be dated when posted/updated. Additionally, the information should be updated whenever the contact or hazard information changes.
- Housekeeping is satisfactory. Floor space and bench space should not be cluttered with excessive storage. Physical hazards should be minimized (e.g., tripping hazards, items that could fall on someone, etc.), and combustible/flammable materials should not be stored in excessive amounts.
- Glass bottles stored on the floor are protected. If glass bottles must be stored on the floor, they must be in a secondary container such as a sturdy cardboard box that minimizes accidental breakage. If the glass bottles contain liquids, the secondary container should be compatible and able to contain the contents of the largest bottle, if breakage should occur.
- Mechanical equipment is appropriately guarded. Any equipment that is belt-driven should have belt guards in place (e.g., vacuum pumps, Parr shakers, etc.). Grinding wheels should have a chip guard in place and moving blades should also have guards in place. Other equipment should be guarded as needed.
- Aisles and exits are unobstructed. There should be no objects that block movement through aisles or exits. Emergency personnel should be able to access all areas of the laboratory through all exit doors, and should be able to move freely in the aisles when smoke may be present.
- All food and beverage items are kept away from laboratory work areas. Food and beverages are forbidden in laboratory work areas. Labs may designate a specific area for food and beverage consumption/storage, provided that the area is clearly marked and chemicals and other laboratory materials are forbidden from that area. Food and beverages must not be stored in refrigerators that also store biological, chemical or radioactive materials.
- Materials are stored to prevent sliding, collapse, falls, or spills. Materials should not be stored in such a way that they could accidentally slide, collapse, fall, or spill.
- Ceiling tiles are in place. Ceiling tiles should not be moved. It can interfere with appropriate airflow in the laboratory.
- Any equipment used in unattended operations has automatic shut-off. Any equipment that is used when unattended should have an automatic shut-off to prevent situations that might result in fire or other emergencies. Examples include electrophoresis auto shut-off and heating baths over-temperature shut-off (for when water completely evaporates).

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Electrical Safety

- Circuits are properly loaded. Electrical circuits should not be overloaded. Overloaded is defined as excessive electrical cords plugged into a circuit through the use of adapters, which allow multiple plug capability. Powerstrips with circuit breakers can be used, but should not be used in a series or with adapters. Three-to-two-prong adapters should never be used to plug a three-wire plug into a two-wire system.
- Cords of all electrical equipment are in good condition. Cords should be inspected for any damage. Cords with damage to the insulation (i.e., wires are visible or tape is needed to hold it together) or frayed cords should be replaced immediately. Equipment with cords that have obvious shorts should also be taken out of service until cords are replaced.
- Cords are used properly. Cords should be kept clear of aisles (trip hazard), sinks, and heat sources.
- Any cut-off switches are readily accessible. Access to cut-off switches should not be obstructed.
- Electrical equipment used in wet locations (within six feet of water) are grounded properly (GFCI protected). GFCI protection must be used for electrical appliances that will be operated within six feet of water.
- Extension cords are used only for temporary purposes. Electrical equipment should be located such that extension cords are not needed on a permanent basis; or, an outlet should be installed close to the equipment. Power strips with circuit breakers are acceptable to use but should not be connected in a series or to an extension cord. Only three prong cords should be used.
- Spark-producing equipment is not used in areas where flammable gases or liquids are used or stored. Spark-producing equipment should not be located in an area where flammable gases or liquids are stored or used (e.g., laboratory chemical hoods).

Emergency/Safety Equipment

- All fire alarm pull stations are unobstructed. self-explanatory
- Suitable fire extinguishers are available where flammable or combustible liquids are used or stored. In general, fire extinguishers suitable for the hazard to be protected should be available.
- Fire extinguishers are available, unobstructed, and mounted properly. Fire extinguishers that are appropriate for the hazards associated with the laboratory should be present. They should also be in an obvious and accessible location near the exit door and/or near the hazard. They should be mounted on the wall and not sitting on the floor.
- Fire extinguisher pressure gauge (if present) is in the normal range and tie (if present) is not broken. Check indicators (if present) on fire extinguishers to be sure that the pressure gauge is in the normal range. . If the indicator is not in the normal range and/or the tie is broken, the extinguisher needs to be serviced through Facilities management at CSB or Fire department at SJU.
- Fire extinguisher service date is current: The fire extinguisher should be tagged with an inspection date within the last year.
- There is presence of obvious physical damage to the fire extinguisher: Confirm that seals or tamper indicators are intact. Check that extinguisher operating instructions are legible and face outward. Note any obvious physical damage. Confirm that the Hazardous Material Identification System label is in place.
- Emergency contact information (e.g. 5000, 9-911 or 911) is posted by phone. Emergency phone numbers should be posted by or on all phones in the laboratory.
- Eye wash is available and unobstructed. Eye washes should be in accessible, unobstructed locations that require no more than 10 seconds to reach. Eye wash

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locations should be identified with a highly viewable sign that is visible within the area served by the eye wash.

- Safety shower available and unobstructed. Safety showers should be in accessible, unobstructed locations that require no more than 10 seconds to reach. Safety shower locations should be identified with a highly visible sign that is visible within the area served by the safety shower.
- Eye wash and shower tested periodically. Eye washes and safety showers should be periodically tested. Testing date should be recorded on a tag or sheet that is posted on or near the eye wash and/or safety shower.
- First aid kit is available and stocked. First aid kit should be accessible and contents kept stocked. If hydrofluoric acid is used in the laboratory, calcium gluconate gel (two-year shelf life) should also be kept in the first aid kit.
- Spill clean up kit is available and stocked. Spill clean up kits should contain appropriate materials to clean up spills that could occur in the laboratory. When materials are used, they should be re-stocked immediately. Spill kit materials should be evaluated for compatibility with the hazards in the laboratory that might require cleaning up. Universal sorbents, such as 3M Powersorb, and spill pads are recommended for spill kits.
- The following personal protective equipment is available as needed: laboratory coats or aprons, safety glasses/goggles, full face shields, gloves appropriate for particular hazard.
 - Laboratory coats or aprons should provide adequate coverage (length is appropriate).
 - Safety glasses/goggles/face shields should be checked for condition of visibility and straps. An appropriate number of visitor safety glasses should be available.
 - Gloves
 - **For use with chemicals**—various types of gloves are required for various chemicals. Latex gloves are not permitted for our purpose for chemical protection. If unsure which gloves to use, consult glove charts available in labs, with EH&S or check with the manufacturer. If gloves are disposable, they should not be reused. Reusable gloves should be checked routinely for holes/leaks.
 - **For use with biological materials**, single-use disposable laboratory gloves are generally adequate. Because of potential allergic reactions, latex gloves should not be provided. Nitrile gloves are recommended. If reusable gloves are used, they must be decontaminated after each use.
 - If respirators are used, personnel using the respirators are required by law to be fit tested and trained to use the respirators. Contact EH&S for more information.
- Chemical hoods have been inspected in the last year. A certification sticker that has been dated during the past year should be on the hood.
- Chemical hoods are free from excessive storage. Excess chemicals and/or equipment should not be stored in the hood, especially if it blocks proper airflow (i.e., blocks back baffle). Large items that must be in a hood are recommended to be elevated approximately two inches on blocks or a stand that allows air to flow beneath the item.
- Biological Safety Cabinets (BSCs) have been certified within the last 12 months. A sticker that lists the last certification date should be present on the cabinet. It is required that a BSC be certified at the time of installation, annually thereafter, and any time the unit is relocated. Certification records dating back at least 3 years should be readily available.

Biological Safety

- Laboratories have doors for access control. Access to the laboratory is limited or restricted at the discretion of the laboratory director when experiments or work with cultures and specimens are in progress.
- Each laboratory contains a sink for hand washing. The sink should be kept stocked with soap and paper towels. A hand washing information that directs staff and students to

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- wash their hands after they handle viable materials, after removing gloves, and before leaving the laboratory should be communicated to all laboratory members.
- The laboratory is designed so that it can be easily cleaned. Spaces between benches, cabinets, and equipment should be readily accessible for cleaning. Carpets and rugs are prohibited because they are difficult to decontaminate.
 - Bench tops are impervious to water and resistant to moderate heat and chemicals used for decontamination of work surfaces and equipment.
 - Laboratory furniture is capable of supporting anticipated loading and uses. Chairs used in laboratory work are covered with a non-fabric material. Laboratory furniture should be sturdy and in good condition. Cloth-covered chairs are prohibited because they are difficult to decontaminate. Vinyl-covered chairs are acceptable.
 - If the laboratory has windows that open to the exterior, they are fitted with fly screens. If installing screens is not an option, windows should be sealed shut.
 - Durable, leak-proof containers are available to transport waste to the autoclave for decontamination. Secondary containment for autoclave bags helps prevent spills of material from unexpected holes or tears in the bag. Appropriate containers for transport include plastic or metal tubs. Do not place transport containers in the autoclave unless you are certain they are composed of "autoclavable" material. Note: If bags are heavy, use of a cart for transport is recommended.
 - Sharps disposal containers are present for the proper disposal of laboratory sharps. Sharps Disposal Containers are available from EH&S. A biohazard waste contractor provides 30gallon containers and picks up full containers for disposal.
 - All containers and bags used for waste collection are closable and prominently display the interlocking ring biohazard symbol. All bags used for waste collection must have the biohazard symbol printed on the bag. If the bag is kept in a container, the container should have a lid and also have the biohazard symbol prominently displayed. When not in use, waste containers waste should be kept closed.
 - Disinfectant is available for daily work surface decontamination and spill clean up. Work surfaces should be decontaminated on completion of work, at the end of the day, and after any spill or splash of viable material with disinfectants that are effective against the agents of concern. For some organisms, 70% ethanol may be effective. For most organisms, a 10% bleach solution is effective. Note that bleach solutions should be prepared fresh each day.

Chemical Safety

- Chemical Hygiene Plan (CHP) available. A current copy of the laboratory's chemical hygiene plan should be accessible to all laboratory personnel. All laboratory personnel should know the location of the CHP and be familiar with its contents. Personnel should also know how to obtain a Material Safety Data Sheet (MSDS) for any given chemical in the laboratory (a required part of the CHP).
- Refrigerator used to store flammables - is designed for flammable storage, or is explosion-proof. Typical refrigerators have ignition sources that are not suitable for flammable materials.
- Chemical storage - is in cabinets or stable shelving. Chemicals should be stored in cabinets or stable shelving. Chemicals should not be stored on the floor or precariously on shelves where they could be knocked off or fall off. Chemicals should be stored by compatibility.
- All contained substances are labeled. All containers of chemical and biological materials must be labeled as to the contents and its hazard category. Even temporary containers should be labeled so that if an emergency arises, another person can identify what is in the container. For chemical waste, the container should describe the contents with the word "waste" (e.g., "waste acetone," "waste halogenated solvents," etc.).

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- No excess flammable liquids are stored. Maximum quantities for flammable liquid storage are determined based on the type of laboratory, the hazard classification of the flammable liquid, the container used for storage, and the fire protection features of the laboratory. (*Reference to NFPA 45 and 30 to determine the maximum quantities of flammables that can be stored in the laboratory, inside and outside of flammable storage cabinets*).
- Peroxidizable chemicals are dated when opened and tested for peroxides every six months. Peroxidizable chemicals must be dated when opened. Once opened, peroxidizable chemicals should be tested every six months for the presence of peroxides, and they should be disposed if no longer needed or if they have formed peroxides.
- Chemical containers are all in good condition. All chemical containers should be in good condition with no cracks, leaks, and with the appropriate lid/cap. Any container that is not in good condition should be replaced immediately once noted.
- All chemical containers are tightly closed when not in immediate use. All chemicals and chemical waste should be stored in containers that can be tightly closed at all times unless in immediate use. Immediate use means that a person is in the vicinity of the container and is actively adding or removing chemicals from the container.
- Knowledge of department Chemical inventory. A familiarity with chemical inventories helps in keeping inventory low and prevents over-purchasing (waste minimization). In addition, inventories can sometimes be useful in responding to an incident in the lab.
- Gas cylinders (at all times) and lecture bottles (when in use) are fastened securely. Cylinders should be secured in an upright position. If the cylinder is not in use, valve caps should be in place. Cylinders with flammable contents should not be stored near cylinders with oxidizers (e.g., oxygen, bromine, chlorine, fluorine, nitric oxide, etc.) Lecture bottles that contain extremely toxic or pyrophoric gases should be stored in ventilated cabinets.
- Mercury devices — thermometers, gauges, switches, etc.—that can be replaced with a mercury-free alternative should be replaced to reduce the amount of mercury present in the laboratory. Knowledge of location of these items is essential.
- Mercury thermometers are not present in heated ovens. Mercury thermometers should not be used in heated ovens. Broken thermometers in ovens pose greater health hazard due to vaporization. The oven may become contaminated in the process. Both clean up or disposal of mercury contaminated items is very expensive process.
- Traps are used when house vacuum is utilized for aspiration, filtering, etc. of any liquids. No liquids should be aspirated directly into the house vacuum lines. There is a potential for a reaction within the lines if laboratory personnel from different laboratories aspirate incompatible chemicals through the vacuum lines. It can also result in expensive repairs to the vacuum lines because of blockage.

Radiation Safety

- Radioactive materials/sources in quantities requiring permit from NRC is currently not acceptable on CSB/SJU campuses. Contact EH&S office, if uncertain whether a radioactive source constitutes permit from NRC.