

Optoelectronic Fabrication Facility's (OFL) Standard Operating Procedures (SOP)

The following OFL Standard Operating Procedures (SOP's) must be read, understood, and practiced at all times. Use common sense when thinking of safety. When working in the OFL, think about your actions and how they will affect other lab members, as well as yourself. The procedures outlined here are for the protection of all OFL lab members

There are no excuses for not following safety procedures and failure to comply with the OFL guidelines will lead to access restrictions and / or expulsion.

Be aware of your own and everyone's safety. If you see a lab member practicing unsafe procedures, do not hesitate to remind him/her of proper methodology. Safety violations should be reported to the OFL Operations Manager at alb@ucsd.edu.

1. OFL ACCESS PROCEDURES

All UCSD Internal Academic Users and External Industrial Users should follow the Access Procedures listed at the OFL web site at: <http://soliton.ucsd.edu/OFL>.

2. OBTAINING OFL EQUIPMENT TRAINING AND AUTHORIZATION IN THE OFL

Each instrument in the OFL has one Super user, an OFL Technical Staff member in charge of maintenance and repair, and Authorized Users. To become an authorized user, please follow the procedure below:

- Make an appointment with any authorized user of that piece of equipment to obtain training on the operation of the machine. You can view a list of authorized users for individual equipment in the OFL at the specific instrument.
- Prepare and clean any essential materials.
- After training, the user should practice on the equipment under the supervision of an authorized user, to become familiar with it. You are not permitted to use any equipment alone before being officially authorized. An authorized user **MUST BE WITH YOU** by the machine at all times while you are learning or practicing to operate it.
- When you feel you can operate the machine independently, you may start the authorization procedure.
- If you are sufficiently knowledgeable with the operation of the instrument, the Super user will give you authorization to independently use the instrument.
- The Super user will notify the Operations Manager and your name will be posted on the Authorized User List for that instrument.
- You are now qualified to independently use that specific instrument in the OFL.

REPORTING EQUIPMENT MALFUNCTIONS AND FAILURES

Users should please immediately report all equipment malfunctions and failures in the OFL directly to Aaron Birkbeck, (alb@ucsd.edu), fill out the problem form located at the entrance of 1511 and place this form on the machine in question letting subsequent users of the problem.

3. GENERAL SAFETY PROCEDURES

- Keep the work area clean and uncluttered.
- Do not leave exposed sharps (needles, razor blades, etc.) unattended.
- Label all containers and keep containers closed except when in use.
- Know the locations of fire extinguishers, eye washes and douse showers.
- Wash hands frequently and before eating.
- Do not eat, smoke or apply cosmetics in the lab.
- Clean up all spills promptly.
- Wear shoes that completely cover the feet.

- Avoid exposure to hazardous materials - wear proper personal protective equipment.
- Horseplay, practical jokes, or other acts of carelessness are prohibited.

A. Buddy System (NEVER WORK ALONE)

If no one is currently working in the OFL, you should wait and enter the lab with at least one other lab member. Once in the lab, locate a lab member and inform them where you will be working. Check up on each other regularly. If no one else is present, you must leave the lab until you can find another lab member. It is a good idea to plan ahead if you want to work in the evening or on a weekend.

B. Handling Emergencies After Hours

The OFL Emergency Response Procedure is posted by the entrance of 1511 and 3317. Please follow the procedure listed. The following is a list of some of the phone numbers detailed in the Emergency Response Plan:

Police/Fire 911

Physical Plant Services 534-2930

Aaron Birkbeck, alb@ucsd.edu During working hours: 822-4158 or 822-1295.

The nature of the emergency will determine whether you will call police, fire, staff, or both. If someone is injured, the 911 emergency number should be called before calling staff member. If there is a facilities problem, such as a flood or a utility problem that does not represent a danger to the lab users but may result in damage to equipment, the staff and Campus Services (x42930) need to be called. The 911 emergency number should not be called for facility or equipment problems. Always call 911 when a potentially life threatening situation might exist (injury, fire, gas leak, suspected bomb, etc.).

C. Safety Awareness

Please report safety problems you encounter to the OFL Operations Manager at: alb@ucsd.edu. Lab members must obey all "DO NOT OPERATE" signs, and equipment messages. Do not try to operate the equipment with this designation.

4. RESTRICTIONS

A. Clothing

Sandals, hi-heels or being shoeless is not permitted in the OFL. Shorts are not permitted in the OFL. Wearing of contact lenses in the lab is discouraged due to the hazard of trapping chemicals in or under your lenses. Soft or hydrated contact lenses may contain up to 50% water by weight and can become irritating if they absorb chemical vapors. If you choose to wear contact lenses in the lab, you do so at your own risk. Safety glasses and goggles are provided and must be worn at all times.

- Additionally, a protective clean room coat, bonnet, and booties must be worn at all times when in the 1507 and 1515A clean room. Failure to don the appropriate attire will result in the user's suspension from the OFL facilities for a 24 hour period.

B. Cell Phone Usage

Cell phone usage is permitted in the OFL hallway only. Cell phones must not be used in laboratory equipment areas or when operating equipment. Lab members are reminded to be courteous to other members when using a cell phone.

5. FIRST AID

Injuries such as minor burns and cuts can be treated with the First Aid Kits available in each room of the OFL. If you use items from the kits, please report their use to the OFL Operations Manager at: alb@ucsd.edu

6. CHEMICAL SAFETY

A. Chemical Information and Reference Materials

A large number of chemicals are used in the OFL. An inventory of all chemicals contained in the lab is listed in the entrance of 1511 and 3317. Additionally, all cabinets under exhaust hoods are clearly labeled with their chemical inventories. If you need to bring a chemical into the OFL you must:

- Send e-mail to Aaron Birkbeck, OFL Operations Manager at alb@ucsd.edu and get approval to bring the chemical into the OFL.
- Make sure an MSDS is ordered at the time the chemical is ordered. Chemicals cannot be brought into the OFL until an MSDS sheet is on file in the MSDS binder in the main hallway of the OFL. MSDS sheets should be given to Aaron Birkbeck when received.
- Any chemical being brought into the OFL must be properly labeled before bringing the chemical into the lab. Clearly identify the lab user and date on the container. Any lab user chemical that does not have the required identification is subject to disposal.
- All chemicals stored in containers must be labeled with contents and dated.
- Lab member "formulations" must bear a "Special Chemical Formula" detailing content percentages.
- OFL members should familiarize themselves with the chemicals that they plan to use in their research.
- To help, lab members can review the Materials Safety Data Sheets (MSDS) Notebook available in the main hallway of the OFL.
- Materials Safety Data Sheets (MSDS) are required for every chemical in the OFL. When requesting the use of a special chemical you must procure a copy of the MSDS for that chemical prior to bringing it into the OFL. Vendors routinely supply MSDS sheets when ordering chemicals. Before using a chemical, read the MSDS!

B. UCSD Chemical Compatibility Storage Guidelines

Separate each of the following classes of chemicals from each other by storing in separate cabinets or by using appropriate tubs or containers. Polypropylene tubs are commonly used for this purpose. All containers should be clearly labeled, and all storage locations should be labeled according to compatibility group. It is important that all lab personnel understand lab procedures for storage of hazardous materials, including where these materials are kept in the lab.

1. **Mineral (Inorganic) Acids** - Examples: hydrochloric acid, sulfuric acid, phosphoric acid, boric acid, and hydrobromic acid.

2. **Oxidizers** - Examples: bromic acid, perchloric acid, chromic acid, nitric acid, many perchlorates, permanganates, bromine, chlorine, fluorine, silver nitrate.

- Oxidizers should not be stored directly on wooden shelves or on paper shelf liners, spills may react and ignite spontaneously.
- Perchloric acid presents special hazards; it must be isolated from oxidizable materials and dehydrating agents.
- Hypochlorite solutions (e.g., bleach) are oxidizers; however, they will release chlorine gas on contact with acids, so store them separately.

3. **Bases/Caustics** - Examples: aqueous ammonia, ammonium hydroxide, potassium hydroxide, and sodium hydroxide.

4. **Organic Solvents/Acids** - Examples: acetone, methanol, isopropyl ether, methylene chloride, carbon tetrachloride, acetic acid, citric acid, benzene, tetrahydrofuran. If space is limited, labs may wish to separate flammable and non-flammable organic liquids in flammable storage cabinets.

5. **Highly Toxic/Carcinogenic** - Examples: sodium azide, acrolein, arsenic pentoxide, pentachlorophenol, hydrazine, botulinum toxin, acrylamide, methyl isocyanate, and phorbol esters.

6. **Pyrophoric Materials** - Examples: diethyl aluminum chloride, lithium, white or yellow phosphorus, trimethyl aluminum.

7. **General "Dry" Lab Chemicals** - Examples: This would include many of the relatively innocuous or unreactive materials commonly found in laboratories.

8. **Gases** - Segregate according to hazard class. Acutely toxic and toxic gases should be stored in gas cabinets or fume hoods. Cylinders should be double-chained or double-strapped to a

substantial, fixed surface. Cylinders should be turned off at the cylinder valve when not in use and should be capped when stored. See Chapter 18 of the EH&S Laboratory Safety Plan for more information.

9. **Water Reactives** - Examples: sodium, potassium, calcium, aluminum tribromide, calcium oxide, and acid anhydrides, metal hydrides.

10. **Controlled Substances** - Narcotics and other controlled substances should be stored in a secure, locked location such as a drawer or safe. See Chapter 14 of the EH&S Laboratory Safety Plan for information. Contact the Chemical Safety Officer at 534-2823 for more information.

B. General Practices for Handling and Storing Chemicals

- Minimize all chemical exposures. Approach all chemicals as hazardous and use common sense -do not taste chemicals, avoid smelling chemicals and do not mouth pipette.
- Do not work alone when handling hazardous materials and do not leave on-going reactions unattended without adequate safety measures.
- Restrict the amount of chemicals ordered, kept on hand, and used; substitute less hazardous chemicals when possible.
- Avoid underestimating the risk. One should assume that any mixture will be more toxic than its most toxic component and that all substances of unknown toxicity are highly toxic.
- Protective glasses or goggles should be worn in the laboratory. Non-vented goggles should be worn when working with acids, caustics, explosives, or hot molten materials.
- Wear proper gloves when working with any hazardous or potentially hazardous materials.
- Warning signs should be posted near any dangerous equipment, reaction, or condition.
- Use fume hoods and other ventilation devices to control exposure to airborne substances.
- All containers must be labeled with chemical name, concentration, and hazard warning.
- Store chemicals by hazard classification, not by alphabetical order. Do not store materials in the fume hood or on the floor.
- Flammable materials should be stored in approved containers.

C. Protecting Yourself – Personal Protective Equipment (PPE)

Prior to working with chemicals, make sure you are properly protected. If working with acids, corrosive or hazardous chemicals, you must wear chemically rated gloves, safety goggles or a face shield. If you will be working with large volumes of acids or corrosives, such as when filling a tank in a wet process station with etchant, or mixing an etchant, you **MUST** wear an apron. If gloves, aprons, goggles or face shields aren't readily available near your location, contact the OFL Staff and the necessary items will be provided. The Polyvinylchloride (PVC) gloves you put on when you enter the lab are for the protection of lab surfaces and equipment, and are not of sufficient strength to protect against chemical burns or solvents.

Three types of gloves are commonly used in the lab:

D. PVC Gloves (clear/disposable)

PVC gloves are located in the main hallway of the OFL and on the bench tops in each room. These are for the protection of lab surfaces from contamination of oils and salts on your hands and must be worn at all times in the lab. Put on a fresh pair of these gloves over the surgical gloves each time you handle contamination-sensitive equipment or samples. An example is the loading of an evaporation boat or e-beam crucible.

E. Heavy Triple Polymer, Acid Resistant (blue)

They are located in a drawer in each room that has wet benches and are for working with etchants and/or corrosives. Check these gloves regularly for wear and replace them when needed. The gloves are chemically rated and must be worn whenever you work with caustics or corrosives. If immersion or exposure of your gloved hands is anticipated, it is required that you leak-check your rubber gloves. This is accomplished by pressurizing them with a nitrogen gun, then immersing them in water. Check for bubbles, a sure sign of a leak.

F. Nitrile Gloves (blue/disposable)

These are available on the bench tops where wet benches are present in the OFL. Their purpose is to limit contamination with processing materials and to provide minor protect to the lab users from chemical exposure. The OFL uses powder-free gloves, which pose less risk for allergic reaction. A more common problem with all gloves is dermatitis from the moisture held against skin while wearing gloves.

G. Cleanroom Apparel

Disposable shoe covers, bonnets, and a clean room smock are provided for each user. Lab users must always wear shoe covers, bonnet, a clean room smock and gloves whenever they are in the lab, whether working or not.

7. TRANSPORTING CHEMICALS IN THE OFL

After removing any item from a wet bench, make sure the doors are closed. Doors must always remain closed for safety reasons. If you cannot locate a chemical listed on these inventory sheets, contact OFL Staff. Chemicals cannot be transported through the lab unprotected. Individual glass bottles must be placed in the black polyethylene safety carriers located on the floor near each wet bench. Remember to return these safety carriers to the area you took them from when you are done with them. Be sure to check that there are no bottles of the chemical you need in your area before bringing in and opening new ones.

8. WORKING WITH CHEMICALS

Always work at a wet process station/fume hood! Fume hoods/wet process stations are exhausted, with face velocities greater than 100 feet/minute. Make sure that sashes are adjusted to the arrow settings. This assures proper exhaust velocity.

A. Dry Chemicals

When measuring out chemicals never pour a chemical back into its reagent bottle. This can contaminate the remaining chemical in the bottle. When removing dry chemicals, pour them out when possible and scoop only when necessary using freshly cleaned spatulas. If you pour out too much, instead of throwing the excess away, you might want to store it in a clean, labeled container for your use later.

B. Solutions

- When mixing acids with water remember to **ADD ACID TO WATER** and **NEVER WATER TO ACID!** An exception to this rule is the wafer cleaning solution called "Piranha". This solution is a mixture of sulfuric acid and hydrogen peroxide. Adding H₂O₂ to H₂SO₄ makes piranha solution.
- Use appropriate containers for your solutions. Do not use glassware for HF, as glass will dissolve. Always place fuming containers toward the back of the fume hoods where there is maximum exhaust. If you must leave an area with a process in progress, make sure you leave your process clearly labeled with your name, the date, time, your expected time of return, where you can be reached (if you will be gone more than 10 minutes) and the chemicals involved. Do not leave chemical processes unattended unless absolutely necessary.
- Use pH strips to identify possible safety hazards from spills or unknown liquids found on or near sink work surfaces. These pH test strips can be found on the bench nearest to any wet bench station.

9. WORKING WITH GaAs

III-V compound semiconductor researchers should review the Material Safety Data Sheet (MSDS) for Gallium Arsenide prior to working with this material. Gallium Arsenide is ranked as a possible carcinogen if it is heated in air above 285°C. Volatile arsenic oxides form at this temperature in air. In addition, Gallium Arsenide is a hazard when ground, cut, or polished.

No dry grinding, lapping or vaporizing of GaAs is allowed in the OFL.

Waste substrates should be disposed of in the "Heavy Metals Waste" container located on the bench tops near the wet process stations.

10. CHEMICAL DISPOSAL

When you are through with your process, clean up completely. Proper disposal procedures:

- Dispose of Acids, as is in the appropriately labeled containers in the wet benches, do not dilute or neutralize.
- Organic Solvents, as is in the appropriately labeled containers in the wet benches. Make sure it's a solvent.
- Waste bottles are not to be overfilled. When a solvent bottle is approximately 85% full:
 - Loosely cap the bottle. DO NOT TIGHTEN THE CAP. This prevents accidental pressure buildup from breaking the bottle.
 - Pick up a replacement chemical waste bottle from under the wet bench.

NOTE: Chemical waste being placed in a Chemical Waste Container must be labeled with the contents. Lab users must contact Aaron Birkbeck at: alb@ucsd.edu to notify him when the Chemical Waste Container needs to be disposed. It is a violation of OFL and UCSD EH&S policy to place unlabeled waste containers in the wet benches.

11. CHEMICAL EXPOSURE AND HYGIENE

If you are exposed to chemicals, the first thing you must do is to:

- Immediately remove all affected clothing.
- Flush the affected areas with water for 15 minutes, not less. Leave your gloves on when possible in order to avoid transfer of the acid to your hands while washing.
- Use the emergency shower and/or eyewashes as necessary. The location of the safety showers and eyewashes are in the service corridors and are clearly marked with signs. Memorize the locations of the safety shower and eyewashes.
- Contact a staff member after you have flushed the exposed area with water.
- If exposure occurs in the evening or on a weekend, contact a staff member listed on the Emergency Response Plan posted by the phone. All injuries occurring in the OFL must be reported to the OFL Operations Manager at: alb@ucsd.edu within 24 hours or on the Monday following a weekend.
- Exposure of the eyes requires flushing with water for at least 15 minutes.
- As a precaution, all exposures to the eye will require a visit to an emergency room for a check up.
- Contact a staff member as soon as possible for assistance or call 911.
- If your eyes are exposed to a chemical while working at a wet process station, utilize the DI water deck hose to flush your eyes instead of trying to make your way to an eyewash station.
- Hold your eyes open and flush continuously for 15 minutes.
- The DI deck hoses will be your fastest response for such an emergency when working at a wet process station.
- HF burns are particularly hazardous. An insidious aspect of HF burns is that there may not be any discomfort until long after exposure. These burns are extremely serious and may result in tissue damage.
- If you contact HF, flush the area well and be sure to work under and around your fingernails.
- Fingernails and cuticles are the classic area people receive burns, having washed off the HF without washing under their nails.
- If washed off within a few minutes of exposure, HF will do no harm.
- Remember that HF may not produce any burning sensation until after it has already done damage. **A physician should look at all HF burns.**

First aid for HF burns to skin:

- Remove contaminated clothing.
- Flush with cold water for 15 minutes.
- Gently massage calcium gluconate ointment into skin.
- There is a container of calcium gluconate ointment at the OFL First Aid Kits, in each room where HF is used.
- Report any HF burns to the Aaron Birkbeck, the OFL Operations Manager at: alb@ucsd.edu or at 822-4158.
- Seek medical attention immediately!

12. CHEMICAL SPILLS

In the event of a chemical spill, the OFL has an inventory of "spill pillows" and "spill kits" to clean up and contain wet chemicals. These are located in each room that has wet benches. The material used in these pillows and kits is selected for large moisture retention and its ability to neutralize acids.

OFL staff will clean up chemical spills during normal working hours. If you need to clean up a spill after hours or on a weekend, obtain one of the spill kits. These kits contain the needed materials to safely clean up a spill.

Report all spills to the Aaron Birkbeck, OFL Operations Manager at: alb@ucsd.edu

13. DISPOSAL OF HAZARDOUS OBJECTS

A. Broken Glassware

Broken glassware should be disposed of by depositing it in the Red Sharps Containers designed for broken glass disposal. These containers are located on the bench tops in each room in the OFL. Contact an OFL staff member if you need help disposing of broken glass. These containers protect the custodial staff from accidental injury from broken glass.

B. Wafers

Wafers and broken wafers are disposed of in the same containers as broken glass.

C. Needles and Razor Blades

Needles and razor blades should be disposed of in the same containers as broken glass. If these plastic containers are full, contact Aaron Birkbeck at: alb@ucsd.edu and he will replace them. Do not dispose of needles, broken glass or razor blades in the waste cans!

D. Broken Thermometers

Because of the danger of metallic mercury, broken thermometers should be disposed of in the "Heavy Metal Waste" container located on the bench top near the wet benches. Contact a staff member for assistance if you break a Thermometer as we also have Mercury pick up kits available.

14. COMPRESSED GASES

FOR ALL GAS CYLINDERS:

- Store cylinders in an upright position and in a well-ventilated area. Cap when not in use.
- Secure cylinders with upper and lower restraints, separate from incompatible gas classes. Laboratory cylinders less than 18" tall may be secured by stands or wall brackets.
- Do not store cylinders in exits or egress routes.
- Cylinders and gas lines must be labeled. Do not depend on color codes.
- Do not roll, drag, slide containers, or lift cylinders by cylinder caps. Instead, use a hand truck or other suitable device.
- Always transport cylinders with cylinder caps in place.
- Do not attempt to repair a cylinder, valve or regulator.
- If a cylinder leak can not be stopped by tightening the valve gland or packing nut, close the leaking valve, replace the valve cap and move the cylinder to a well ventilated area (i.e., outdoors). Notify EH&S (534-3660) or the campus police (9-1-1) as soon as possible.
- Always use the correct regulator and never use adapters.

- Cylinders of flammable gases, such as oxy-acetylene torch units, should have flashback protectors installed.
- Compressed gas cylinders can corrode or degrade over time and should be returned to the manufacturer if they are no longer being used. This will remove any potential hazard and save the demurrage charge, which can exceed the cost of the gas over time.
- Do not use lecture bottles if other cylinders are available. Lecture bottles are very difficult to dispose of and they use universal threads and valves (some of which are interchangeable).
- If lecture bottles are used, label all associated equipment with the gas name to prevent unintentional mixing of incompatible materials. Contact the Chemical Safety Officer at (858) 534-2823 for more information.

A. Handling Gas Cylinders

Cylinders of both toxic and non-toxic compressed gases are in use throughout the lab. Lab members may change out N₂ cylinders only and are not allowed to install or disconnect any toxic cylinders. Improper installation or purging will contaminate a full bottle of gas. Some of our etching gases cost hundreds of dollars and their loss or contamination are very costly.

Gas cylinders must be chained or strapped at the top and bottom of the cylinder at all times.

B. Toxic Gases

All toxic compressed gas cylinders are handled by trained staff only. There are several reasons for this policy. Some gases are toxic. Some gases in these cylinders are at high pressures, some as high as 3000 psi. Regulators are designed to handle specific gases and can explode if not properly chosen. All toxic, flammable or corrosive gases are kept in steel gas cabinets. Among the toxic gases used in the OFL are ammonia and dichlorosilane gases. Examples of corrosive gases are chlorine and BCl₃ gases used in the RIE/PECVD. Most of these gases have a characteristic odor. Ammonia has a pungent, acrid odor. Silane, a pyrophoric gas (i.e. ignites upon contact with air), is used for PECVD and RIE. If a gas leak is suspected, the OFL must be evacuated. Before an empty cylinder is changed out, OFL Staff shall backfill all gas lines back to the regulator outlet port with N₂, and pump out through the related system in operation in order to purge the lines of any residual toxic gas. The backfill and purge operation shall be performed three times, prior to changing out an empty cylinder. OFL Staff shall wear the appropriate respirator whenever changing out an empty toxic gas cylinder.

If you notice an unusual odor, leave the lab and immediately report it to the staff so an evacuation announcement can be made. If staff is unavailable, such as during weekends or after hours, use the Fire Alarm Pull to automatically alert the Campus Fire Department.

C. Nitrogen Guns

Nitrogen guns and compressed gas can inflate the skin like a balloon, tearing it away from the tissue underneath. Be cautious and avoid cuts when spraying nitrogen or working around gas streams.

15. CRYOGENS

Liquid nitrogen or "LN₂" is used commonly in the lab. Lab members are not permitted to change out any LN₂ tanks in the OFL service corridors. These containers are large and heavy and should be moved with care. LN₂'s major hazards are burns from freezing and damage to the lab floor from freezing and cracking. Wear gloves and goggles when filling LN₂ containers.

16. FIRE HAZARDS

A. Fire Prevention

Fires in the lab can result from many causes including ignition of flammable gases or solvents, and combustion of materials. Use care when using heat lamps or heating flammable solvents on hot plates. Always use a water bath to transfer heat to flammable solvents when using a hot plate. Avoid water around electricity and use common sense when working in the lab.

B. In Case of Fire

In the event of a fire, use the extinguishers located in the main hallway of the OFL or in the Service Corridors and report it to the OFL staff. Follow the usage instructions that are provided on the extinguishers. These fire extinguishers are Halon type extinguishers capable of extinguishing all types of fires without damaging equipment. Two Halon extinguishers can be found at both entrances of 1511, 1515, 3317 and in the service corridors of the main hallway in the OFL. The campus Fire Department regularly checks and recharges the fire extinguishers.

Report any use of a fire extinguisher to Aaron Birkbeck, the OFL Operations Manager at: alb@ucsd.edu immediately. OFL users are not expected to be fire fighters and should evacuate the building when a fire threatens safety. For fires, evacuate the lab by the main entrance and pull go to the Red Alarm Pull box located on the wall next to the main door to the OFL. Pull down on the white handle. Immediately leave the building. If your clothes catch fire, use the showers and do not panic. **MAKE SURE YOU KNOW THE LOCATION OF THE SHOWERS AND EYE WASH STATIONS!**

C. Sprinkler System

The OFL is covered by a water type sprinkler system. When water flows, an alarm is automatically sent to the fire station and firefighters will respond.

17. ELECTRICAL SAFETY

All electrical power wiring is to be done by OFL staff or Physical Plant Services. Learn the locations of the circuit breakers, in the Service Corridors, required by the equipment you use. In case of electrocution of someone in the lab, do not touch or grab him or her. Do not attempt to shut off power on the system. Hit the Red, Emergency Power Cut Off Button on the wall in the room you are in. **BE CERTAIN THAT YOU MEMORIZE THE LOCATION OF THIS EMERGENCY SHUT OFF BUTTON IN EACH ROOM.** Lab members can also use the circuit breakers in the service corridors. Report all electrical problems to staff.

18. OFL EVACUATION PROCEDURES

- When the building fire alarm sounds, you **MUST** evacuate EBU1. Exit the building from the stairwell nearest you. A map of the first floor of EBU1 is posted in the main hallway of the OFL, and on the wall just outside the main entry door.
- Secure your process and leave the lab quickly. When you hear the Fire Alarm, you **MUST** evacuate the OFL.
- If an alarm sounds and the OFL staff is not present, evacuate other lab users as you leave.
- **DO NOT** use the elevators when evacuating the building in an emergency situation.
- After exiting the building, assemble upwind of EBU1.
- Follow the OFL Emergency Procedures posted by the telephone. Contact a staff member if possible. If no staff is available, call 911.

References:

1. R. Hamilton, UCB Microlab Chemical Hygiene Plan, 2001
2. UCSD EH&S, Laboratory Safety Training Plan, January 2001
3. University of California, Lawrence Livermore National Lab, ES&H Manual, April 2001