

# GENERAL LABORATORY STANDARD OPERATING PROCEDURES

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## 1. OVERVIEW

It is your responsibility to ensure that your actions do not jeopardize your safety or that of other members of the Department. It is essential that you understand how to operate equipment properly and that you observe required laboratory practices. Familiarize yourself with this general procedure, addressing general safety and health requirements for work in the laboratory, as well as the specific handling requirements included in the SOP for each specific hazard class and/or process that you will be working with.

For these reasons, before starting work you must ensure that you have attended the appropriate training and that you have received relevant instructions from your Supervisor. If at any time you are unsure of the correct procedure, contact your Laboratory Manager before starting work.

## 2. GENERAL HEALTH AND SAFETY INFORMATION

Eye protection, appropriate gloves, and laboratory coats are required in the laboratory when working with chemicals. Any additional or specific PPE must be worn where the risk assessment indicates the need. These should be removed **before** leaving the laboratory. Disposable gloves should not be re-used.

Closed-toes shoes are required whenever you are working in the laboratory, even if you are just entering data.

Know where the accident and safety equipment are located:

- First Aid Kit – **Next left of the main exit door**
- Safety Shower – **Next right of the main exit door**
- Eye Wash Stations – **Next right of the main exit door**
- Chemical Response Spill Kits – **On the bench, right next to evaporator**
- Chemical Fume Hoods – **Middle of the exit door-side wall**
- Fire Extinguishers – **Next left of the main exit door**
- Fire Alarms – **Next left to the inside door of Building Exit, across from room 143**
- Emergency Shut-off on Equipment – **Follow the manual of each system**
- Location of Emergency Telephone numbers and telephones. – **In the hallway, across from the room 135**

Safety Showers and Eyewashes should be within the work area for immediate emergency use, if required. Access should be checked at the beginning of each shift. A clear path must be maintained at all times.

### 3. GENERAL LABORATORY RULES

- All workers are responsible for maintaining their laboratory in a clean, tidy, safe condition.
- Always clean up after yourself, as a cleaner or work colleague may not know what the spill is.
- When you leave the Department, you are responsible for the safe disposal of all of your chemicals, solvents, cultures, etc.
- Food and drink must not be consumed in laboratories or be stored in laboratory refrigerators or freezers.
- Eating, drinking, smoking, handling contact lenses, or applying cosmetics is not permitted in the laboratories.
- Wash your hands after handling chemical materials, after removing gloves , and before leaving the laboratory.
- Mouth pipetting is forbidden. Mechanical pipettes are provided instead.
- All procedures are to be performed carefully to minimize the creation of splashes or aerosols.
- High risk work should only be performed during working hours when other members of staff are present. Working after hours should only be done if it is unavoidable and on SOP's for which risk assessments deem the risk to be low and manageable. The Supervisor is responsible for assessing the risk of work being carried out and whether the person undertaking the work is competent.
- If a piece of equipment breaks down or needs maintenance, make sure it is decontaminated before asking someone to work on it. Do not continue using a piece of equipment that seems faulty or try to repair it yourself; report it to the Laboratory or Facilities Manager.
- Hypodermic needles should never be re-capped or removed from syringes. Simply place them in a sharps bin as soon as you have finished with the procedure.
- Before using a piece of equipment for the first time, study the instruction manual and seek training by an experienced operator. If in doubt, speak with your Laboratory Manager or PI.
- Fume cabinets must not be used as storage areas.
- Turn equipment off when not in use.
- After finishing an experiment, or when taking a break or going home, clean up as follows:
  - ✓ Replace tops on solutions and return containers to appropriate places.
  - ✓ Replace lids on all pipette canisters.
  - ✓ Rinse and decontaminate all dirty glassware and place in trolley for wash up.
  - ✓ Turn off equipment.
  - ✓ Wipe down benches, close windows and doors, and turn off lights.

#### 4. SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

Wash thoroughly after handling any contaminated material, chemical, or waste.

All chemical containers must have a legible, firmly attached label showing the contents of the container. Labels on incoming containers of hazardous chemicals must not be removed or defaced. Any labels that are damaged must be immediately replaced with labels containing the same identification, warnings, and source information.

A hazard review of new materials not previously used in the laboratory must be completed under the direction of the PI before actual handling of the material begins.

Chemical substances (or by-products) developed in the laboratory are assumed to be hazardous in the absence of other information.

Store all chemicals in a tightly closed, labeled container, and in a cool, dry, well-ventilated area. Segregate from incompatible materials. Secondary containers must be labeled clearly. Follow any substance-specific storage guidance provided in Safety Data Sheet documentation.

Use small quantities whenever possible. Monitor your inventory closely to assure that you have tight control over your material.

#### 5. SPILL AND INCIDENT PROCEDURES

##### **Chemical Spill** - Dial 911 and EH&S 951-827-5528

Assess the extent of danger. Help contaminated or injured persons. Evacuate the spill area. Avoid breathing vapors. If possible, confine the spill to a small area using a spill kit or absorbent material. Keep others from entering contaminated area (e.g., use caution tape, barriers, etc.).

- ***Small*** – If you have training, use appropriate personal protective equipment and clean-up materials for the chemical spilled. Double-bag spill waste in clear plastic bags, label, and arrange for chemical waste pick-up.
- ***Large***– Dial 911 and EH&S at 951-827-5528 for assistance. Notify others in area of spill. Turn off ignition sources in area. Evacuate area and post doors to spill area. Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

***Chemical Spill on Body or Clothes*** – Remove clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Seek medical attention. Notify supervisor and EH&S at 951-827-5528 immediately.

***Chemical Splash Into Eyes*** – Immediately rinse eyeball and inner surface of eyelid with water from the emergency eyewash station for 15 minutes by forcibly holding the eye

open. Seek medical attention. Notify supervisor and EH&S at 951-827-5528 immediately.

**Medical Emergency** - Dial 911 and EH&S 951-827-5528

**Refer to “Injuries and Medical Treatment” Flipchart posted in the laboratory.**

## **6. WASTE DISPOSAL**

All waste must be disposed of through the EH&S Hazardous Waste Program. Staff dealing with hazardous waste disposal should have completed UCR Hazardous Waste Management training - <http://ehs.ucr.edu/training/online/hwm/indexlms.html>

General hazardous waste disposal guidelines:

- Affix an on-line hazardous waste tag using the Online Tag Program (OTP - <https://otp.ucop.edu/>) on all waste containers as soon as the first drop of waste is added to the container.
- Store hazardous waste in closed containers, in secondary containment, and in a designated location. Do not let product enter drains. Discharge into the environment must be avoided.
- Double-bag dry waste using transparent bags.
- Waste must be under the control of the person generating and disposing of it.
- Dispose of routinely generated chemical waste within 90 days.
- Request a waste pick-up on-line: <http://ehs.ucr.edu/services/waste.html>

## **7. PRIOR APPROVAL/REVIEW REQUIRED**

All work with hazardous chemicals must be pre-approved by the Principal Investigator and all training must be well documented. In addition, the following shall be completed:

- Document specific training on the techniques and processes to be used.
- Read and understand the relevant Safety Data Sheet.
- Demonstrate competence to perform the work.

A review of this SOP and re-approval is required when there are any changes to procedures, personnel, or equipment, or when an incident or near miss occurs.

## **8. SAFETY DATA SHEETS**

Online SDS can be found at <http://www.ehs.ucr.edu/services/msds.html>.

## **9. PROTOCOL**

All lab workers who will be working in the laboratory must review this SOP and sign the associated training sheet. Lab workers must have specific training on the proper handling of chemicals and must understand the hazards. In addition, all workers should

review the SOP for each specific hazard class and/or process with which they will be working.

Lab workers must demonstrate competence to the Principal Investigator or designee by being able to: 1) identify the hazards and list any particularly hazardous handling techniques (use of a Schlenk line, rotary evaporation, canula transfer, extremes of pressure or temperature, etc.), 2) list the foreseeable emergency situations, 3) describe the proper response to the emergency situations, and 4) know the appropriate control measures to minimize the risks.

When working in the lab, a laboratory worker must:


- 1) not work alone;
- 2) be cognizant of all of the SDS and safety information presented in this document;
- 3) follow all related SOPs in the laboratory SOP bank (PPE, syringe techniques, waste disposal, etc. as appropriately modified by any specific information in the SDS information presented in this document);
- 4) employ no more than the approved amounts of chemicals in any given reaction (larger quantities REQUIRE the approval of PI or designee), and
- 5) discuss ALL issues or concerns regarding chemicals with the PI prior to their use.

If there is an unusual or unexpected occurrence when using these materials or processes, the occurrence must be documented and discussed with the Principal Investigator or Lab Supervisor and others who might be using the same chemical or process. Unusual or unexpected occurrences might include a fire, explosion, sudden rise or drop in temperature, increased rate of gas evolution, color change, phase change, or separation into layers.

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SOP Reviewed and Approved by:

Francisco Zaera  
Print name

  
Signature

Approval Date: 06/17/2013

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- Chemical Response Spill Kits – **On the bench, right next to balance**
- Chemical Fume Hoods – **N/A**
- Fire Extinguishers – **Next left of the main exit door**
- Fire Alarms – **Next left to the inside door of Building Exit, across from room 143**
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- Chemical Response Spill Kits – **On the bench, right next to fume hood**
- Chemical Fume Hoods – **Right side of the exit door**
- Fire Extinguishers – **Next right of the main exit door**
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- Fume cabinets must not be used as storage areas.
- Turn equipment off when not in use.
- After finishing an experiment, or when taking a break or going home, clean up as follows:
  - ✓ Replace tops on solutions and return containers to appropriate places.
  - ✓ Replace lids on all pipette canisters.
  - ✓ Rinse and decontaminate all dirty glassware and place in trolley for wash up.
  - ✓ Turn off equipment.
  - ✓ Wipe down benches, close windows and doors, and turn off lights.

#### 4. SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

Wash thoroughly after handling any contaminated material, chemical, or waste.

All chemical containers must have a legible, firmly attached label showing the contents of the container. Labels on incoming containers of hazardous chemicals must not be removed or defaced. Any labels that are damaged must be immediately replaced with labels containing the same identification, warnings, and source information.

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Use small quantities whenever possible. Monitor your inventory closely to assure that you have tight control over your material.

#### 5. SPILL AND INCIDENT PROCEDURES

##### **Chemical Spill** - Dial 911 and EH&S 951-827-5528

Assess the extent of danger. Help contaminated or injured persons. Evacuate the spill area. Avoid breathing vapors. If possible, confine the spill to a small area using a spill kit or absorbent material. Keep others from entering contaminated area (e.g., use caution tape, barriers, etc.).

- Small – If you have training, use appropriate personal protective equipment and clean-up materials for the chemical spilled. Double-bag spill waste in clear plastic bags, label, and arrange for chemical waste pick-up.
- Large– Dial 911 and EH&S at 951-827-5528 for assistance. Notify others in area of spill. Turn off ignition sources in area. Evacuate area and post doors to spill area. Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

Chemical Spill on Body or Clothes – Remove clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Seek medical attention. Notify supervisor and EH&S at 951-827-5528 immediately.

Chemical Splash Into Eyes – Immediately rinse eyeball and inner surface of eyelid with water from the emergency eyewash station for 15 minutes by forcibly holding the eye

open. Seek medical attention. Notify supervisor and EH&S at 951-827-5528 immediately.

**Medical Emergency** - Dial 911 and EH&S 951-827-5528

**Refer to “Injuries and Medical Treatment” Flipchart posted in the laboratory.**

## **6. WASTE DISPOSAL**

All waste must be disposed of through the EH&S Hazardous Waste Program. Staff dealing with hazardous waste disposal should have completed UCR Hazardous Waste Management training - <http://ehs.ucr.edu/training/online/hwm/indexlms.html>

General hazardous waste disposal guidelines:

- Affix an on-line hazardous waste tag using the Online Tag Program (OTP - <https://otp.ucop.edu/>) on all waste containers as soon as the first drop of waste is added to the container.
- Store hazardous waste in closed containers, in secondary containment, and in a designated location. Do not let product enter drains. Discharge into the environment must be avoided.
- Double-bag dry waste using transparent bags.
- Waste must be under the control of the person generating and disposing of it.
- Dispose of routinely generated chemical waste within 90 days.
- Request a waste pick-up on-line: <http://ehs.ucr.edu/services/waste.html>

## **7. PRIOR APPROVAL/REVIEW REQUIRED**

All work with hazardous chemicals must be pre-approved by the Principal Investigator and all training must be well documented. In addition, the following shall be completed:

- Document specific training on the techniques and processes to be used.
- Read and understand the relevant Safety Data Sheet.
- Demonstrate competence to perform the work.

A review of this SOP and re-approval is required when there are any changes to procedures, personnel, or equipment, or when an incident or near miss occurs.

## **8. SAFETY DATA SHEETS**

Online SDS can be found at <http://www.ehs.ucr.edu/services/msds.html>.

## **9. PROTOCOL**

All lab workers who will be working in the laboratory must review this SOP and sign the associated training sheet. Lab workers must have specific training on the proper handling of chemicals and must understand the hazards. In addition, all workers should

review the SOP for each specific hazard class and/or process with which they will be working.

Lab workers must demonstrate competence to the Principal Investigator or designee by being able to: 1) identify the hazards and list any particularly hazardous handling techniques (use of a Schlenk line, rotary evaporation, canula transfer, extremes of pressure or temperature, etc.), 2) list the foreseeable emergency situations, 3) describe the proper response to the emergency situations, and 4) know the appropriate control measures to minimize the risks.

When working in the lab, a laboratory worker must:


- 1) not work alone;
- 2) be cognizant of all of the SDS and safety information presented in this document;
- 3) follow all related SOPs in the laboratory SOP bank (PPE, syringe techniques, waste disposal, etc. as appropriately modified by any specific information in the SDS information presented in this document);
- 4) employ no more than the approved amounts of chemicals in any given reaction (larger quantities REQUIRE the approval of PI or designee), and
- 5) discuss ALL issues or concerns regarding chemicals with the PI prior to their use.

If there is an unusual or unexpected occurrence when using these materials or processes, the occurrence must be documented and discussed with the Principal Investigator or Lab Supervisor and others who might be using the same chemical or process. Unusual or unexpected occurrences might include a fire, explosion, sudden rise or drop in temperature, increased rate of gas evolution, color change, phase change, or separation into layers.

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SOP Reviewed and Approved by:

Francisco Zaera  
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Print name

  
\_\_\_\_\_  
Signature

Approval Date: 06/17/2013

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# GENERAL LABORATORY STANDARD OPERATING PROCEDURES

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## 1. OVERVIEW

It is your responsibility to ensure that your actions do not jeopardize your safety or that of other members of the Department. It is essential that you understand how to operate equipment properly and that you observe required laboratory practices. Familiarize yourself with this general procedure, addressing general safety and health requirements for work in the laboratory, as well as the specific handling requirements included in the SOP for each specific hazard class and/or process that you will be working with.

For these reasons, before starting work you must ensure that you have attended the appropriate training and that you have received relevant instructions from your Supervisor. If at any time you are unsure of the correct procedure, contact your Laboratory Manager before starting work.

## 2. GENERAL HEALTH AND SAFETY INFORMATION

Eye protection, appropriate gloves, and laboratory coats are required in the laboratory when working with chemicals. Any additional or specific PPE must be worn where the risk assessment indicates the need. These should be removed **before** leaving the laboratory. Disposable gloves should not be re-used.

Closed-toes shoes are required whenever you are working in the laboratory, even if you are just entering data.

Know where the accident and safety equipment are located:

- First Aid Kit – Next left of the main exit door
- Safety Shower – Next left of the main exit door
- Eye Wash Stations – Next left of the main exit door
- Chemical Response Spill Kits – On the bench, right next to sink
- Chemical Fume Hoods – N/A
- Fire Extinguishers – Next left of the main exit door
- Fire Alarms – Next left to the inside door of Building Exit, across from room 143
- Emergency Shut-off on Equipment – Follow the manual of each system
- Location of Emergency Telephone numbers and telephones. – In the hallway, across from room 135

Safety Showers and Eyewashes should be within the work area for immediate emergency use, if required. Access should be checked at the beginning of each shift. A clear path must be maintained at all times.

### 3. GENERAL LABORATORY RULES

- All workers are responsible for maintaining their laboratory in a clean, tidy, safe condition.
- Always clean up after yourself, as a cleaner or work colleague may not know what the spill is.
- When you leave the Department, you are responsible for the safe disposal of all of your chemicals, solvents, cultures, etc.
- Food and drink must not be consumed in laboratories or be stored in laboratory refrigerators or freezers.
- Eating, drinking, smoking, handling contact lenses, or applying cosmetics is not permitted in the laboratories.
- Wash your hands after handling chemical materials, after removing gloves , and before leaving the laboratory.
- Mouth pipetting is forbidden. Mechanical pipettes are provided instead.
- All procedures are to be performed carefully to minimize the creation of splashes or aerosols.
- High risk work should only be performed during working hours when other members of staff are present. Working after hours should only be done if it is unavoidable and on SOP's for which risk assessments deem the risk to be low and manageable. The Supervisor is responsible for assessing the risk of work being carried out and whether the person undertaking the work is competent.
- If a piece of equipment breaks down or needs maintenance, make sure it is decontaminated before asking someone to work on it. Do not continue using a piece of equipment that seems faulty or try to repair it yourself; report it to the Laboratory or Facilities Manager.
- Hypodermic needles should never be re-capped or removed from syringes. Simply place them in a sharps bin as soon as you have finished with the procedure.
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- Fume cabinets must not be used as storage areas.
- Turn equipment off when not in use.
- After finishing an experiment, or when taking a break or going home, clean up as follows:
  - ✓ Replace tops on solutions and return containers to appropriate places.
  - ✓ Replace lids on all pipette canisters.
  - ✓ Rinse and decontaminate all dirty glassware and place in trolley for wash up.
  - ✓ Turn off equipment.
  - ✓ Wipe down benches, close windows and doors, and turn off lights.

#### 4. SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

Wash thoroughly after handling any contaminated material, chemical, or waste.

All chemical containers must have a legible, firmly attached label showing the contents of the container. Labels on incoming containers of hazardous chemicals must not be removed or defaced. Any labels that are damaged must be immediately replaced with labels containing the same identification, warnings, and source information.

A hazard review of new materials not previously used in the laboratory must be completed under the direction of the PI before actual handling of the material begins.

Chemical substances (or by-products) developed in the laboratory are assumed to be hazardous in the absence of other information.

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#### 5. SPILL AND INCIDENT PROCEDURES

##### **Chemical Spill** - Dial 911 and EH&S 951-827-5528

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**Refer to “Injuries and Medical Treatment” Flipchart posted in the laboratory.**

## **6. WASTE DISPOSAL**

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Francisco Zaera  
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Print name

  
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- Eye Wash Stations – **Next right of the main exit door**
- Chemical Response Spill Kits – **On the bench, next left of the sink**
- Chemical Fume Hoods – **Corner of the room**
- Fire Extinguishers – **Outside in the hallway**
- Fire Alarms – **Outside in the hallway**
- Emergency Shut-off on Equipment – **On the left-side wall of the main exit door**
- Location of Emergency Telephone numbers and telephones. – **In the hallway.**

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Francisco Zaera  
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Print name

  
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Signature

Approval Date: 04/01/2014

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