

UC Irvine Environmental Health & Safety
Listed Carcinogens Program

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UCI Listed Carcinogens Program

I. Program Objectives

Listed Carcinogens are a small group of regulated chemicals used in research laboratories. Environmental Health & Safety (EH&S) has developed this UCI Listed Carcinogens Program in order to further facilitate research by providing guidelines that would assist in safety and compliance with applicable federal and state regulations. The California Occupational Safety and Health Administration (Cal/OSHA) describes the requirements under Title 8, Article 110, Section 5209. This program outlines the responsibilities of EH&S, the principal investigators, lab managers, and the staff and students whom they supervise. The objectives of this program highlight seven important elements necessary for the safe and legal use of Listed Carcinogens on campus:

1. Registration and authorization for use.
2. Establishment of 'Regulated Areas' for storage and handling.
3. Establishment of a medical surveillance and evaluation plan for users.
4. Establishment of Personal Protective Equipment requirements.
5. Appropriate training for UCI faculty, staff, and students on the hazards & controls, availability of resources, and their responsibilities for ensuring safety and compliance on campus.
6. Regulatory compliance with all applicable Cal/OSHA requirements.
7. Proper reporting of use to all applicable government agencies.

II. Scope

This program covers all facilities on campus that handle or store Listed Carcinogens. Table 1 below shows the chemicals covered under this program.

2-Acetylaminofluorene	3,3-Dichlorobenzidine Dihydrochloride	4-Nitrobiphenyl
4-Aminodiphenyl	3,3-Dichlorobenzidine Dihydrogen Bis(sulfate)	N-Nitrosodimethylamine
Benzidine Acetate	3,3-Dichlorobenzidine Sulfate	b-Propiolactone
Benzidine Dihydrochloride	3,3-Dichlorobenzidine	Bis-Chloromethyl Ether
Benzidine Hydrochloride	4-Dimethylaminoazobenzene	Chloromethyl Methyl Ether
Benzidine Sulfate	a-Naphthylamine	Ethyleneimine
Benzidine	b-Naphthylamine	

All users of Listed Carcinogens should be suitably trained & qualified and familiar with this program in its entirety to ensure safety and compliance with Federal and State regulations.

III. Procurement, Registration, and Authorization to Use

All listed carcinogen purchases must be requisitioned through the UCI Purchasing Department as a high value requisition and requires approval from EH&S. EH&S will approve the purchase after ensuring that the lab is suitably equipped to comply with the applicable regulations. Administrative tools such as Standard Operating Procedures and training will also be reviewed prior to approval.

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1. Procurement: prior to any purchase, the PI must submit the order information for the intended carcinogen(s) to EH&S for review and approval. Compliance with all requirements as described in the "Use Requirements" section below is a prerequisite for such approval.
2. Registration & Authorization to use: in order to register and become an authorized user of chemical carcinogens, the PI shall follow the steps below:
 - a. After obtaining approval from EH&S, complete the Carcinogen Registration form found in the Appendix;
 - b. Add the chemical carcinogen into the Chemical Inventory System (CIS);
 - c. Add the names of all users to the authorized personnel list;
 - d. Submit all users for mandatory medical evaluation prior to any work;
 - e. Notify EH&S within 5 days of any changes to a listed carcinogen possession, location, and/or users;
 - f. Post the Carcinogen Registration Form while the chemical is in use;

IV. Use Requirements

A. Regulated Area, Storage and Containment

1. The following activities must be performed in an established Regulated Area which can be an enclosed glove box or a ducted chemical fume hood with the appropriate safety controls in place as listed in the definitions:
 - a. Working with any solid Listed Carcinogen (for example, mixing, weighing, etc.);
 - b. Working with any Listed Carcinogen in concentrations greater than the concentrations as described in the Definitions section;
 - c. High risk operations with a greater risk of exposure involving Listed Carcinogens (aerosolizing the solution, sonication, operations involving highly volatile materials, working with a stock solution that is highly concentrated);
 - d. Working with large amounts of solvents that have the potential of being pre-cursors, or have previous studies indicating probable carcinogenic potential.
2. Access shall be restricted to authorized users only.
3. Fume hoods shall have an average face velocity of 150 feet per minute with no point lower than 125 feet per minute and shall be inspected at a minimum every six months.
4. Laboratory vacuum systems shall be protected with high efficiency scrubbers or with disposable absolute filters. Only high efficiency scrubbers shall be used with beta-propiolactone, bis-chloromethyl ether, methyl chloromethyl ether, or ethyleneimine.
5. Laboratories and rooms where Listed Carcinogens are used shall have ventilation that is negative with respect to the corridors and the external environment.
6. Storage locations shall be under negative pressure with required signage.
7. Work surfaces are to be protected from contamination. Plastic backed absorbent material is suggested.

B. Written Procedures

1. The principle investigator or project supervisor is required to prepare a written Safety Protocol for review. This protocol shall include the following information for each chemical carcinogen used in the laboratory:
 - a. Name of principal investigator and/or project supervisor and their contact information;
 - b. Names of all other personnel associated with the project and their contact information;
 - c. Names, amounts, physical form, concentrations, and storage/use locations of the carcinogens involved;
 - d. Proper precautions for handling during normal use, including personal protective equipment and location restrictions;
 - e. A brief description of the experiment, including:
 - i. Concentrations of stock and working solutions;
 - ii. Techniques and equipment to assure containment;
 - iii. Emergency procedures including deactivation and/or decontamination;
 - iv. Personal protective measures to be employed and/or equipment to be used;
 - v. Duration of the proposed project;

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- vi. An appropriate means of detecting spills and contamination and decontaminating surfaces that may become contaminated with the Listed Carcinogen. This information can often be found in the Safety Data Sheet (SDS) for the chemical of concern;
- vii. Emergency procedures for spills must be specified.

C. Labels and Signs

1. All entrances to designated Listed Carcinogen work areas (Regulated Areas) should be posted with a sign stating "CAUTION: Cancer Suspect Agent". These signs are available from EH&S.
2. All primary and secondary containers, storage cabinets, glove boxes, and fume hoods containing Listed Carcinogens should be labeled with the following information:
 - a. The name of the carcinogen and any other hazardous substance;
 - b. Caution: Cancer Suspect Agent;
 - c. Other hazard warnings such as corrosive, flammable etc.;
 - d. The date and initials of person who prepared the mixture.

D. Protective Clothing, Equipment, and employee hygiene

1. Minimum laboratory protective clothing and equipment for handling hazardous materials or animals include, but are not limited to, a laboratory coat, closed-toe/heel shoes, safety glasses, goggles and/or face shield if there is a risk of a splash hazard, and gloves if there is a risk of skin irritation, absorption or injury. Additional safety equipment and clothing requirements e.g. respiratory protection and/or disposal garments, may be required as part of a specific protocol (radiological, biological, carcinogen, or animal care and use).
2. Appropriate and necessary protective clothing and personal protective equipment (PPE) will be determined by performing a laboratory hazard assessment as part of the Injury and Illness and Prevention Plan (IIPP). The assessment is to be administered by the supervisor and employee(s).
3. Disposable gloves and sleeves are required when entering a Regulated Area. A disposable apron is recommended in case of a potential for a splash. Clothing contaminated by Listed Carcinogens should be removed immediately. Place contaminated clothing in double plastic bags, labeled with the name of the carcinogen and send to an approved industrial laundry. When clothing decontamination methods are not known or are not practical, disposable protective clothing should be worn.
4. Gloves should be selected based on the properties of the chemicals being used as well as the physical operation being performed. Multiple layers may be necessary to prevent permeation when working with a mixture. Disposable gloves shall be discarded after each use and immediately after contamination with a Listed Carcinogen. Gloves must be removed before touching doorknobs, telephones, elevator controls or in other situations where contamination could be transferred to non-laboratory areas.
5. Eye protection shall be worn in the laboratory any time chemical work is performed. Generally, proper use of engineering controls will provide sufficient protection to maintain exposure levels below Cal/OSHA permissible exposure limits. In some instances, non-routine operations may require the use of respirators. Contact EH&S for further evaluation of non-routine operations.
6. Employees shall be required to wash hands, forearms, face, and neck upon each use of a Listed Carcinogen and exit from a Regulated Area.
7. Employees working with animals in conjunction with Listed Carcinogens shall be required to shower after the last exit of the day from a Regulated Area.

E. Information and Training

1. Hazard information and safety procedures should be reviewed and updated annually with laboratory and animal care personnel who work with or who may be exposed to Listed Carcinogens. Training records should be documented with the name and signature of each attendee, the name of the trainer, the content of the class and the date. Training is generally conducted in house and provided by the PI or a laboratory supervisor, competent in the risks and hazards associated with the scope of work.
2. Training for all authorized users should include the following:
 - a. A description of the use that could result in exposure including written experimental procedures;
 - b. The nature of the physical and health hazards (i.e. fire, explosion, carcinogenic, toxicity) associated with exposure;
 - c. Local and systemic toxicity, and review of the Safety Data Sheet for the carcinogen;

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- d. Engineering controls, administrative controls, personal protective equipment and laboratory or general work practices to limit exposure;
 - e. Employee responsibilities for following prudent laboratory practices to reduce risk of exposure;
 - f. Monitoring methods and observations that may be used to detect or evaluate the presence or release of a carcinogen;
 - g. Proper storage, labeling and disposal practices.
3. Training is required prior to the employee's initial work with the Listed Carcinogen. Refresher training should be completed and documented at least annually.

F. Waste Management

1. Before beginning an activity that involves the use of a Listed Carcinogen, plans should be developed for the handling and disposal of contaminated wastes and surplus carcinogens.
2. Whenever practical, carcinogens should be inactivated prior to disposal as hazardous waste. It is the responsibility of the principal investigator to document the validity of the inactivation method.
3. Waste containing or contaminated with any amount of chemical carcinogen is considered hazardous unless evaluated and determined to be non-hazardous by the EH&S Waste Coordinator.
4. Before requesting a waste pick-up:
 - a. Segregate carcinogen waste from other waste;
 - b. Contaminated materials that are to be transferred from work areas to disposal areas should first be placed in a plastic bag, or other suitable impermeable container, and then in a primary container. Label the outer container with (i) the name of the carcinogen and (ii) "CAUTION: Cancer Suspect Agent";
 - c. Waste must be labeled with a standard Hazardous Waste label as well as labels stating: "CAUTION: CANCER SUSPECT AGENT". Labels are available from EH&S;
 - d. Submit chemical waste pick-up requests via the EH&S web site. A separate form is used for sharps disposal;
 - e. Spill waste must be collected, labeled and disposed as hazardous waste;
 - f. Contaminated wastes and animal carcasses shall be incinerated in such a manner that no carcinogenic products are released;
 - g. Mixed chemical and radiological or biological wastes require special consideration. Contact EH&S for guidance.

G Annual Review and Self-Audits

1. Principal Investigators with Listed Carcinogens are required to conduct an annual review and self-audit of the safety practices and procedures in the lab. An e-mail reminder will be sent to the principal investigator and lab contact to notify them that an annual chemical inventory review and self-audit is due.
2. The self-audit must include:
 - a. A check of engineering controls (e.g. chemical fume hood, glove box, local exhaust) and other safety equipment;
 - b. Verification that the Safety Protocol is posted and followed;
 - c. Verification that a current Safety Data Sheet for the carcinogen is available;
 - d. Verification that materials required to cope with minor spills and other emergencies are readily available;
 - e. Verification that only suitably trained and qualified personnel are performing the procedures
 - f. Review of work, containment, and emergency procedures for accuracy, sufficiency, and consistency with approved protocols;
 - g. A review of the inventory of chemical carcinogens.

H. Carcinogen Use in Animals

Listed Carcinogen use in animal experiments may present a significant risk of exposure to animal handlers. The Principal Investigator must take special precautions to ensure that animal handlers are not at risk of exposure to chemical carcinogens and other hazardous materials. For example, contamination may be present on the fur or skin of an animal, in animal body fluids or excreta. Carcinogen-treated food may contaminate the floor of the animal room. Rooms housing animals treated with Listed Carcinogens must meet the same containment and engineering controls as required for laboratories.

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V. Responsibilities

The following outlines the responsibilities of all parties including the principal investigator, lab personnel and Environmental Health and Safety.

Responsibilities:

Principal Investigators & Lab Managers

The principal investigator carries the primary responsibility of ensuring that there is no potential of harm/exposure from listed carcinogens and that all safety roles and responsibilities are being performed appropriately as per regulations. Tasks can be delegated to trained personnel, however, it is the ultimate responsibility of the PI to ensure the following:

1. All lab personnel using listed carcinogens have documented training on the following:
 - a. *Lab Safety Fundamentals* (www.ucl.edu)
 - b. *Chemical Hygiene Plan* (http://www.ehs.uci.edu/programs/lsg/UCI_CHP.pdf)
 - c. *Safety Data Sheets* for all Listed Carcinogens in the lab
 - d. *Written Standard Operating Procedures (SOPs)* for Listed Carcinogens
-

2. All aspects of the Listed Carcinogens Program are followed, engineering controls are being maintained, and appropriate PPE is provided and used by lab personnel as per regulation.
-

3. A minimum of two people are in the lab when Listed Carcinogens are being used.
-

4. Emergency Response and Evacuation Procedures are available and reviewed by both users and non-users of Listed Carcinogens.
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5. The lab's chemical inventory list with the names and quantities of Listed Carcinogens is updated and EH&S is notified regarding any changes in uses.
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6. Lab safety inspections are conducted before new procedures utilizing Listed Carcinogens and deficiencies are corrected within a reasonable time period.
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Responsibilities:

Environmental Health & Safety

UC Irvine Environmental Health and Safety bears the responsibility of overseeing compliance for the Listed Carcinogen program, making sure the labs and facilities are in full compliance with Federal and State regulations. EH&S will also guide the principal investigator / researchers on safe practices and address issues presented in regards to laboratory moves, research direction changes or employee involvement. It is the responsibility of EH&S to ensure the following:

1. Requests for new Listed Carcinogen purchases and uses are reviewed and approved in a timely manner based on EH&S and regulatory requirements. Review and approval is conducted in cooperation with the PI and the Purchasing Department.

2. The PI is adequately supported in developing safety procedures and selecting appropriate equipment for the proposed use of Listed Carcinogens. Most importantly, identify a location that complies with the regulation.

3. A detailed hazard assessment and safety evaluation is performed for each proposed use of a new Listed Carcinogen. If additional information is required, the PI/ user/requestor will be contacted. The evaluation and assessment will be used to determine what safety controls will be required for the proposed use.

4. Regulatory agencies are notified in a timely manner of any changes to the program requiring notification. EH&S will be the primary campus contact for regulatory agency inspections and will also perform an annual review of the written UCI Listed Carcinogen Program.

5. Any deficiencies in the lab setup are addressed with the PI. EH&S will assist the department in implementing safety modifications to help the lab meet the requirements for approval.

6. An accurate inventory of Regulated Areas is maintained and that each area is in full compliance with regulation at all times.

7. Logs of authorized users that are in the medical surveillance program are maintained and any changes to the list of authorized users are recorded.

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Responsibilities:

Authorized Users

Researchers, being the primary users of Listed Carcinogens need to be cautious, cooperative and inquisitive regarding the use of these chemicals. The following responsibilities are required of all researchers:

1. Ensure that a Safety Training Self Assessment (STSA) is performed online and all required trainings are completed. Courses include:

- a. *Lab Safety Fundamentals* (www.ucl.edu)
 - b. *Chemical Hygiene Plan* (http://www.ehs.uci.edu/programs/lsg/UCI_CHP.pdf)
 - c. *Safety Data Sheets for all Listed Carcinogens in the lab*
 - d. *Written Standard Operating Procedures (SOPs) for Listed Carcinogens*
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2. Participate in the writing of process SOPs and perform a hazard analysis of the process along with the principal investigator. Inform EH&S of new Listed Carcinogens uses AND lab peers of such changes.

3. Label all Regulated Areas as well as equipment in the lab involving use and storage of Listed Carcinogens. Regulated Areas must also be planned and communicated to all lab members.

4. Learn all assigned responsibilities from the PI including maintaining a log for use, disposal of used PPE, maintenance of engineering controls and storage.

5. Understand all regulatory requirements, PPE, and safety controls outlined in this program.

6. Understand the requirement and submit for medical surveillance as part of the program until work is ceased.

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Responsibilities:

Non-Users in labs with Listed Carcinogens

Personnel not using or handling Listed Carcinogens must attain a level of hazard awareness in order for the lab to maintain compliance with regulation. The PI carries the responsibility of informing non-users of the presence of Listed Carcinogens and their responsibilities as follows:

1. Completion of all assigned training including SDS review and hands-on training with the principal investigator regarding responses to Listed Carcinogen emergencies.

2. Be aware of the Regulated Areas for storage and use of Listed Carcinogens and also of the hazards associated with unauthorized access of these areas.

VI. Medical Surveillance

- A. At no cost to the employee, an annual medical surveillance program shall be provided in consultation with the Occupational Health Program. This includes annual follow-ups and exit physicals. Medical clearance is a requirement prior to any work with Listed Carcinogens.
1. All personnel working with Listed Carcinogens must be provided access to medical surveillance:
 - a. Prior to working with a Listed Carcinogen;
 - b. When an employee develops signs and symptoms of exposure;
 - c. Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure;
- B. All work related medical evaluations and examinations will be performed under the direction of The Center for Occupational and Environmental Health (COEH) by a licensed physician or staff under the direct supervision of a licensed physician. Evaluations and examinations will be provided to the employee or laboratory personnel, without loss of pay, and at a reasonable time and place.
1. Information required by Occupational Health Physician:
 - a. EH&S referral form;
 - b. Patient Information form;
 - c. History exposure form;
 - d. A copy of laboratory standard operating procedures and safety data sheets of the Listed Carcinogens to be used;
 - e. The Listed Carcinogen registration form;
 - f. Any additional information required by COEH in assessing or treatment of an exposure
 2. Physician Notification:
 - a. A written medical statement providing clearance or limitations to work with a Listed Carcinogen shall be provided to the employee or laboratory personnel and EH&S. The licensed health care provider shall discuss confidentially with the employee or laboratory personnel any evidence found of any work-related limitation. If accommodations or limitations are required it will be necessary to contact the PI or employer in conjunction with EH&S and Human Resources and or Disability Services to address the concerns and limit exposure;
 - b. All patient medical information is protected by California and Federal law and is considered strictly confidential. COEH is prohibited from disclosing any patient medical information that is not directly related to the work-related exposure under evaluation and should not reveal any diagnosis unrelated to exposure. Any patient information disclosed by COEH to the employee's or laboratory personnel's supervisor will be limited to information necessary in assessing their return to work, including recommended restrictions in work activities. Any patient information disclosed by COEH to EH&S will be limited to information necessary to develop a course

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of exposure monitoring or perform hazard assessments and incident investigations, if appropriate. COEH will otherwise disclose patient medical information only as required by California and Federal law, such as for Worker's Compensation Insurance claims. Each employee has the right to access his/her own personal medical and exposure records. COEH will provide an employee with a copy of his/her medical records upon written request.

3. Procedures to enroll in Medical Surveillance:
 - a. PI must complete properly the listed carcinogen registration form and submit to EH&S;
 - b. PI must send a copy of the registration form to the Occupational Health Coordinator at occhlth@uci.edu;
 - c. Occupational Health Coordinator will provide employee or laboratory personnel with medical forms to be completed;
 - d. Once the forms are received employee or laboratory personnel will be asked to contact COEH for an appointment;
 - e. Employee or laboratory personnel visits COEH and completes all necessary testing – blood work or any additional testing required by the treating physician;
 - f. COEH submits clearance to the Occupational Health Coordinator
 - a. Individual is clear to work with materials and becomes an Authorized User
 - b. Not clear to work with materials
 - i. Work together with PI, HR, EH&S and Disability Services if necessary
 - c. Additional accommodations required
 - i. Work together with PI, HR, EH&S and Disability Services if necessary.
 - g. Follow up annual – Occupational Health Coordinator will send referral and patient forms annually thereafter and cc PI/Supervisor of this requirement;
 - h. If employee or laboratory personnel is leaving the university they will need to contact the Occupational Health Coordinator at occhlth@uci.edu a month in advance in order to schedule their exit physical.

VII. Definitions

Face velocity:

Average linear air velocity into the exhaust system measured at the opening of the hood

Authorized User:

An employee whose duties require them to be in a Regulated Area and that applied for Carcinogen Use Authorization of Cal/OSHA 5209 carcinogens by:

- Completing a Standard Operating Procedure
- Submitting a Carcinogen Use Registration form to EH&S
- Successfully completing a carcinogen survey with EH&S
- Receiving medical clearance

Absolute Filter:

A filter capable of retaining 99.97 percent of a mono disperse aerosol of 0.3 micrometer particles.

Decontamination:

The process of inactivation of a carcinogen or its safe disposal.

Regulated Area:

An area where entry and exit is restricted and controlled.

A regulated area shall be established where a Listed Carcinogen is used, released, stored or otherwise handled. All work conducted in a Regulated Area must comply with the following:

1. Laboratories and rooms where chemicals are used/stored shall have a general room ventilation negative with respect to the corridors and surrounding areas.

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- Experiments/procedures which could produce aerosols must be confined to a laboratory hood or a glove box.
- The exhaust ventilation for the Regulated Area must be filtered or scrubbed.
- The ventilation system for the regulated area must be separate from other ventilation systems.
- The regulated area laboratory fume hood must have an average face velocity of 150 fpm and a minimum of 125 fpm.
- The laboratory fume hood or other ventilation system for the regulated area must be tested every 6 months or after modification/maintenance operations by fully qualified personnel to certify correct containment.
- A current inventory of the 5209 Listed Carcinogens must be maintained.
- Employees are to be provided with & required to wear daily change of clean disposable sleeves, apron, and gloves.
- Contaminated clothing must be removed before leaving the Regulated Area.
- All staff must wash hands, forearms, face, and neck upon each exit from the Regulated Area.
- All work surfaces where the carcinogen is handled must be protected from contamination
- Contaminated wastes & animal carcasses must be decontaminated prior to leaving the regulated area and must be collected in closed impervious containers.
- All entrances to Regulated Areas must bear signs stating:

**CANCER-SUSPECT AGENT
AUTHORIZED PERSONNEL ONLY**

Listed Carcinogen:

This procedure applies to the Cal/OSHA 5209 listed carcinogens and to solid or liquid mixtures with a content more than the percent specified below:

<i>Chemical</i>	<i>Chemical Abstracts</i>	
	<i>Registry number</i>	<i>Percent *</i>
2-Acetylaminofluorene	53-96-3	1.0
4-Aminodiphenyl	92-67-1	0.1
Benzidine (and its salts)	92-87-5	0.1
3,3'-Dichlorobenzidine (and its salts)	91-94-1	1.0
4-Dimethylaminoazobenzene	60-11-7	1.0
alpha-Naphthylamine **	134-32-7	1.0
beta-Naphthylamine **	91-59-8	0.1
4-Nitrobiphenyl	92-93-3	0.1
N-Nitrosodimethylamine	62-75-9	1.0
beta-Propiolactone	57-57-8	1.0
bis-Chloromethyl ether	542-88-1	0.1
Methyl chloromethyl ether	107-30-2	0.1
Ethyleneimine	151-56-4	1.0

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VIII. Appendix

CAL/OSHA LISTED CARCINOGEN USE REGISTRATION

PI Name: _____	Date: _____
Lab Contact: _____	PI Signature: _____
Department: _____	Campus Extension: _____
Building and room number: _____	Emergency Number: _____
Mailing Address: _____	

Personnel Handling Carcinogen(s)*:

Name	UCI netID	Job Title/Work Position	Collective bargaining unit

**All personnel must be trained on the safe handling of carcinogens prior to the start of their job assignment. Training records must be maintained and made available for review by EH&S and regulatory agencies.*

Listed Carcinogens (Cal/OSHA Regulation Section 5209)	CAS No.	Quantities	Concentration	Physical form	Frequency of Use*
2- Acetylaminofluorene	53-96-3				
4- Aminodiphenyl	92-67-1				
Benzidine (and its salts)	92-87-5				
Benzidine Acetate	36341-27-2				
Benzidene Dihydrochloride	531-85-1				
Benzidine Hydrochloride	14414-68-7				
Benzidine Sulfate	21136-70-9				
3,3'- Dichlorobenzidine (and its salts)	91-94-1				
3,3'- Dichlorobenzidine dihydrochloride	612-83-9				
3,3'- Dichlorobenzidine dihydrogen bis(sulfate)	64969-34-2				
3,3'- Dichlorobenzidine sulfate	74332-73-3				
4- Dimethylaminoazobenzene	60-11-7				
alpha- Naphthylamine	134-32-7				
beta- Naphthylamine	91-59-8				
4- Nitrobisphenyl	92-93-3				
N- Nitrosodimethylamine	62-75-9				
beta- Propiolactone	57-57-8				
bis- Chloromethyl ether	542-88-1				
Methyl chloromethyl ether	107-30-2				

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Ethyleneimine	151-56-4			
		<i>*Frequency of Use?(D)aily / (W)eekly / (M)onthly / (I)nfrequently</i>		

Name of Chemical:

Brief Description of Project:

Lab Operations Involving Listed Carcinogens (check all applicable items):

- | | | | |
|--|--|---------------------------------------|---|
| <input type="checkbox"/> Heating | <input type="checkbox"/> Sonication | <input type="checkbox"/> Weighing | <input type="checkbox"/> Distillation |
| <input type="checkbox"/> Pressurized vessels | <input type="checkbox"/> Electrophoresis | <input type="checkbox"/> Transferring | <input type="checkbox"/> Separation/extraction |
| <input type="checkbox"/> Vacuum systems | <input type="checkbox"/> Blending | <input type="checkbox"/> Centrifuging | <input type="checkbox"/> Other electrical systems |

Other types of operations:

Hazard Assessment (exposure risks and physical hazards of these operations):

- | | | |
|---|---|------------------------------------|
| <input type="checkbox"/> Inhalation/respiratory | <input type="checkbox"/> Skin absorption/irritation | <input type="checkbox"/> Ingestion |
| <input type="checkbox"/> Eye irritation | <input type="checkbox"/> Particulates | <input type="checkbox"/> Gaseous |

Other hazards:

Facilities Description:

Location (Room no., Building) Storage: _____ Usage: _____
 Containment Features (e.g. fume hoods, glove boxes, secured storage areas, etc.) Fume Hood ID# _____

Animal Facilities Containment (if applicable):

Attach additional operational safety procedures to be utilized:

Personal protective equipment to be used:

Chemical spill procedures in place (Describe how employees would handle a possible spill):

Waste disposal procedures in place (Describe in short how waste is disposed of at the end of experiment):

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Surveyor: _____

*To be filled out after a thorough survey has been performed

*A separate page to be completed for each individual chemical