# UC Irvine Environmental Health & Safety

## Listed Carcinogens Program

![Carcinogen Hazard Sign](image)

### Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Program Objectives</td>
<td>1</td>
</tr>
<tr>
<td>II. Scope</td>
<td>1</td>
</tr>
<tr>
<td>III. Procurement, Registration, and Authorization to use</td>
<td>1</td>
</tr>
<tr>
<td>IV. Use Responsibilities</td>
<td>2</td>
</tr>
<tr>
<td>V. Responsibilities</td>
<td>6</td>
</tr>
<tr>
<td>Principle Investigators &amp; Lab Managers</td>
<td>6</td>
</tr>
<tr>
<td>Environmental Health &amp; Safety</td>
<td>7</td>
</tr>
<tr>
<td>Authorized Users</td>
<td>8</td>
</tr>
<tr>
<td>Non users in labs with Listed Carcinogens</td>
<td>8</td>
</tr>
<tr>
<td>VI. Medical Surveillance</td>
<td>9</td>
</tr>
<tr>
<td>VII. Definitions</td>
<td>10</td>
</tr>
<tr>
<td>VIII. Appendices</td>
<td>13</td>
</tr>
<tr>
<td>Appendix A: Listed Carcinogen Authorization Pre-Check</td>
<td>14</td>
</tr>
<tr>
<td>Appendix B: Listed Carcinogen Use Registration Form</td>
<td>16</td>
</tr>
<tr>
<td>Appendix C: Listed Carcinogen Annual Self-Audit</td>
<td>18</td>
</tr>
</tbody>
</table>
UCI Listed Carcinogens Program

I. Program Objectives

Listed Carcinogens are a small group of chemicals uniquely regulated by Cal/OSHA and Federal OSHA for their propensity to cause cancer. 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 permissible use of Listed Carcinogens on the UCI 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. Establishment of appropriate training requirements for UCI faculty, staff, and students on the hazards & controls, availability of resources, and their responsibilities for ensuring safety and compliance on campus.
6. Promote regulatory compliance with all applicable Cal/OSHA requirements.
7. Facilitate 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.

<table>
<thead>
<tr>
<th>Table 1 – Listed Carcinogens</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Nitrobiphenyl</td>
</tr>
<tr>
<td>alpha-Naphthylamine</td>
</tr>
<tr>
<td>methyl chloromethyl ether</td>
</tr>
<tr>
<td>3,3’-Dichlorobenzidine (and its salts)</td>
</tr>
<tr>
<td>bis-Chloromethyl ether</td>
</tr>
<tr>
<td>beta-Naphthylamine</td>
</tr>
<tr>
<td>Benzidine (and its salts)</td>
</tr>
</tbody>
</table>

All users of Listed Carcinogens should be qualified for working with these materials, suitably trained, 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

Purchases of all listed carcinogen must be made 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.**

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. Complete and submit the Listed Carcinogen Authorization Pre-check (Appendix A).
2. **Registration & Authorization for use:** in order to register and become an authorized user of a listed carcinogens, the PI shall follow the steps below:
   a. After obtaining approval from EH&S, complete the Listed Carcinogen Registration form (Appendix B);
   b. Add the chemical carcinogen into the Chemical Inventory System;
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;

If you have existing material in your laboratory which was not previously registered, please complete the Listed Carcinogen Authorization Pre-check (Appendix A).

IV. Use Requirements

A. Regulated Area, Storage, and Containment

1. The following activities must be performed in an established Primary 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 Section VII - Definitions;
   c. High risk operations with a greater risk of exposure involving Listed Carcinogens (volatilizing or aerosolizing the solution, sonication, operations involving intrinsically highly volatile materials, working with a stock solution that is highly concentrated);
   d. Working with large amounts of material that have the potential to produce any of the listed carcinogens via reactivity or degradation.
2. Access to all Regulated Areas shall be restricted to authorized users only.
3. Fume hoods used as a Primary Regulated Area 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 within or part of a Primary Regulated Area 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. Secondary Regulated Areas, laboratories and rooms where Listed Carcinogens are used or stored, shall have ventilation that is negative with respect to the adjoining Non-regulated areas and the external environment and have the required signage.
6. Work surfaces which might come into contact with a Listed Carcinogen 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 Standard Operating Procedure for review. This procedure 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. Outline waste disposal and decontamination procedures;
   f. 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;
      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.
UCI Listed Carcinogens Program

C. Labels and Signs

1. Warning signs should be placed at the following areas associated with the Listed Carcinogen Regulated Areas:
   a. All entrances to Secondary Regulated areas
   b. All equipment used to as a Primary Regulated Area (fume hoods, gloveboxes, Closed Systems for Storage, etc).
   c. Any cabinets, drawers, and refrigerators where Listed Carcinogens are stored

Warning signs should contain the following information:

   Danger.
   (Chemical Identification).
   May Cause Cancer.
   Authorized Personnel Only

Templates and warning signs are available at EH&S.

2. All primary and secondary containers and storage cabinets should be labeled with any other applicable hazard warnings such as corrosive, flammable etc. necessary for compliance with the Hazard Communication Standard (Section 5194).

3. All primary containers should be labeled with the date and initials of the person who prepared the mixture.

D. Protective Clothing, Equipment, and Hygiene Requirements

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. A daily change of clean, protective laboratory clothing, such as a solid-front gown, surgical scrub suit, or fully buttoned laboratory coat is required for activities involving the use of a Listed Carcinogen. The required change of clean, protective clothing for employees engaged in animal support shall include coveralls or shirt and pants, foot covers, head covers, gloves and appropriate respiratory equipment or devices.
   a. Clothing contaminated by Listed Carcinogens should be removed immediately. Place contaminated clothing in an impervious container, labeled with the name of the carcinogen and its hazards for decontamination through an approved industrial laundry service or disposal.
   b. Prior to each exit from a regulated area, protective clothing and equipment shall be left at the point of exit, and at the last exit of the day, used clothing and equipment shall be collected in impervious containers, labeled with the name of the carcinogen and its hazards for decontamination through an approved industrial laundry service or disposal.
   c. When clothing decontamination methods are not known or are not practical, disposable protective clothing should be worn.

4. Gloves should be selected to provide both appropriate chemical resistance as well as protection to any other physical hazards present while being compatible with the physical operation being performed.
   a. Disposable gloves shall be discarded after each use and immediately after contamination with a Listed Carcinogen. Used gloves should be collected as dry hazardous waste.
   b. If manipulations of a listed carcinogen are conducted within an approved fume hood, double gloving or the use of an inner and outer gloving strategy is encouraged so that the outer glove may be removed and collected within the hood.
   c. Additional care should be taken to remove potentially contaminated gloves prior to touching doorknobs, telephones, computers or in other situations where contamination could be readily transferred out of the regulated area.

5. Eye protection shall be worn in the laboratory any time chemical work is performed.

6. Proper use of approved 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.

7. Employees shall be required to wash hands, forearms, face, and neck upon each use of a Listed Carcinogen and exit from a Regulated Area.
UCI Listed Carcinogens Program

8. 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;
   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. All inactivation procedures must be approved by EH&S and documented according to the Benchtop Waste Treatment Regulations.

3. Waste containing or contaminated with any amount of listed 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 listed 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) "Danger: May Cause Cancer";
   c. Waste must be labeled with a standard Hazardous Waste label as well as labels stating: “Danger: May Cause Cancer”. 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;
UCI Listed Carcinogens Program

3. A form to help laboratories perform the required annual self-audit and log the results is provided in Appendix C.

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.

If animal experiments are planned with a listed carcinogen, the submitted SOP should provide a robust description of the entire experiment including post-exposure handling and list all locations associated the animal maintenance during and after exposure.

If you are planning animal research with a listed carcinogen, please contact Chemical Safety (chemsafety@uci.edu) as early as possible to arrange a consultation prior to submitting any of the required forms.
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.uclc.edu)
   b. Chemical Hygiene Plan (http://www.ehs.uci.edu/programs/lsg/UCI_CHP.pdf)
   c. 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. For all Listed Carcinogens in the lab, Safety Data Sheets are available and all laboratory members know how to access the SDSs.

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

5. Emergency Response and Evacuation Procedures are available and reviewed by both users and non-users of Listed Carcinogens.

6. The lab’s chemical inventory list with the names and quantities of Listed Carcinogens is updated and EH&S is notified within 5 days regarding any changes in uses.

7. Safety assessments are conducted and reported to EH&S before implementing new procedures utilizing Listed Carcinogens and annual Self-Audits are conducted and documented.
## UCI Listed Carcinogens Program

### 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 practices that will promote workplace safety and help to mitigate or effectively manage risk. 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, assessing to ensure that an indicated location that complies with the regulation.

3. Proposed Regulated Areas will be assessed to ensure locations and equipment meets performance requirements stipulated by the regulation.

4. 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. Guidance and support will be provided when additional exposure monitoring is warranted.

5. 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.

6. 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.

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

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

9. Regulatory changes that impact permitted work practices will be conveyed back to the PI/researchers to ensure continued compliance.
# 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.uclc.edu)
   - b. Chemical Hygiene Plan (http://www.ehs.uci.edu/programs/lsg/UCI_CHP.pdf)
   - c. Written Standard Operating Procedures (SOPs) for Listed Carcinogens

2. Review Safety Data Sheets associated with Listed Carcinogens in the laboratory.

3. 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.

4. 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.

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

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

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

## 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. 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 spill, leak, explosion, or other occurrence resulting in the likelihood of hazard exposures;

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.

C. Information required by Occupational Health Physician:

D. EH&S referral form;

E. Patient Information form;

F. History exposure form;

G. A copy of laboratory standard operating procedures and safety data sheets of the Listed Carcinogens to be used;

H. The Listed Carcinogen registration form;

I. Any additional information required by COEH in assessing or treatment of an exposure

J. 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 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.

K. Procedures to enroll in Medical Surveillance:
   a. PI must complete properly the listed carcinogen registration form and submit to EH&S at chemsafety@uci.edu;
   b. A copy of the listed carcinogen registration form will be forwarded to the Occupational Health Coordinator at ochnlth@uci.edu;
   c. The Occupational Health Coordinator will provide employee or laboratory personnel with medical forms to be completed;
      i. EH&S referral form;
      ii. Patient Information form;
      iii. History exposure form;
      iv. A copy of laboratory standard operating procedures and safety data sheets of the Listed Carcinogens to be used;
      v. The Listed Carcinogen registration form;
      vi. Any additional information required by COEH in assessing or treatment of an exposure
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
   i. Individual is clear to work with materials and becomes an Authorized User
   ii. Not clear to work with materials
      1. Work together with PI, HR, EH&S and Disability Services if necessary
   iii. Additional accommodations required
      1. 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.

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 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.

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 Listed 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.

**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:
UCI Listed Carcinogens Program

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Chemical Abstracts Registry Number</th>
<th>Percent *</th>
<th>Hazard Statements (5029.e.D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Acetylaminofluorene</td>
<td>53-96-3</td>
<td>1.0</td>
<td>Cancer.</td>
</tr>
<tr>
<td>4-Aminodiphenyl</td>
<td>92-67-1</td>
<td>0.1</td>
<td>Cancer.</td>
</tr>
<tr>
<td>Benzidine (and its salts)</td>
<td>92-87-5</td>
<td>0.1</td>
<td>Cancer and acute toxicity effects.</td>
</tr>
<tr>
<td>3,3’-Dichlorobenzidine (and its salts)</td>
<td>91-94-1</td>
<td>1.0</td>
<td>Cancer and skin sensitization.</td>
</tr>
<tr>
<td>4-Dimethylaminoazobenzene</td>
<td>60-11-7</td>
<td>1.0</td>
<td>Cancer; skin effects; and respiratory tract irritation.</td>
</tr>
<tr>
<td>alpha-Naphthylamine **</td>
<td>134-32-7</td>
<td>1.0</td>
<td>Cancer; skin irritation; and acute toxicity effects.</td>
</tr>
<tr>
<td>beta-Naphthylamine **</td>
<td>91-59-8</td>
<td>0.1</td>
<td>Cancer and acute toxicity effects.</td>
</tr>
<tr>
<td>4-Nitrobenzyl</td>
<td>92-93-3</td>
<td>0.1</td>
<td>Cancer.</td>
</tr>
<tr>
<td>N-Nitrosodimethylamine</td>
<td>62-75-9</td>
<td>1.0</td>
<td>Cancer; liver effects; and acute toxicity effects.</td>
</tr>
<tr>
<td>beta-Propiolactone</td>
<td>57-57-8</td>
<td>1.0</td>
<td>Cancer; skin irritation; eye effects; and acute toxicity effects.</td>
</tr>
<tr>
<td>bis-Chloromethyl ether</td>
<td>542-88-1</td>
<td>0.1</td>
<td>Cancer; skin, eye, and respiratory tract effects; acute toxicity effects; and flammability.</td>
</tr>
<tr>
<td>Methyl chloromethyl ether</td>
<td>107-30-2</td>
<td>0.1</td>
<td>Cancer; skin, eye and respiratory effects; acute toxicity effects; and flammability.</td>
</tr>
<tr>
<td>Ethyleneimine</td>
<td>151-56-4</td>
<td>1.0</td>
<td>Cancer; mutagenicity; skin and eye effects; liver effects; kidney effects; acute toxicity effects; and flammability.</td>
</tr>
</tbody>
</table>

* By weight or volume

** This section does not apply to these materials in operations involving the destructive distillation of carbonaceous material, such as in coke ovens.

Regulated Area:
An area where entry and exit is restricted and controlled.

Secondary Regulated Area: Room(s) where a Listed Carcinogen is stored or handled.

Primary Regulated Area: Approved equipment (fume hood, glovebox, etc) where a listed carcinogen is handled or closed system for storage of listed carcinogen.

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

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

2. Experiments/procedures which could produce aerosols must be confined to an approved laboratory hood or a glove box.

3. The exhaust ventilation for the Regulated Area must be filtered or scrubbed.

4. The ventilation system for the Secondary regulated area must be separate from other ventilation systems.

5. The primary regulated area laboratory fume hood must have an average face velocity of 150 fpm and a minimum of 125 fpm, constructed and maintained in such a way that an operation involving a carcinogen within the enclosure does not require the insertion of any portion of any employee’s body other than hands and arms.

6. The primary regulated area, laboratory fume hood or other ventilation system, must be tested every 6 months or immediately after modification/maintenance operations by fully qualified personnel to certify correct containment.

8. A current inventory of the 5209 Listed Carcinogens must be maintained.

11. All staff must wash hands, forearms, face, and neck upon each exit from the Regulated Area.

UCI Listed Carcinogens Program
Revision: February 2020
12. All work surfaces where the carcinogen is handled must be protected from contamination.
13. Contaminated wastes & animal carcasses must be decontaminated prior to leaving the regulated area and must be collected in closed impervious containers.
14. All entrances to Regulated Areas must bear signs stating:

    Danger:
    (Chemical Identification)
    May Cause Cancer
    Authorized Personnel Only
Appendix A: UCI Listed Carcinogen Authorization Pre-Check
Appendix B: UCI Listed Carcinogen Use Registration Form
Appendix C: UCI Listed Carcinogen Annual Self-Audit
Appendix A: UCI Listed Carcinogen Authorization Pre-Check

**Laboratory Information:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI Name</td>
<td></td>
</tr>
<tr>
<td>PI Signature</td>
<td></td>
</tr>
<tr>
<td>Lab Contact</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
</tr>
<tr>
<td>Department</td>
<td></td>
</tr>
<tr>
<td>Campus Extension</td>
<td></td>
</tr>
<tr>
<td>Building and Room</td>
<td></td>
</tr>
<tr>
<td>Mailing Address</td>
<td></td>
</tr>
<tr>
<td>Chemical Name</td>
<td></td>
</tr>
<tr>
<td>CAS Number</td>
<td></td>
</tr>
<tr>
<td>Storage Only</td>
<td>Yes</td>
</tr>
<tr>
<td>Is this material</td>
<td>To be purchased</td>
</tr>
</tbody>
</table>

1. **Define the Secondary Regulated Area:** The room defined where the listed carcinogen is produced, processed, used, released, stored or otherwise handled. This is an area where access can be restricted to only authorized personnel.
   
   Designation of a secondary regulated area is required for all handling of a regulated carcinogen, including locations for storage only.
   
   A. Access to the Secondary Regulated Area should be limited to authorized personnel only.
   
   B. At a minimum, the Secondary Regulated Area must contain a sink for washing. Areas designated for beta-propiolactone or ethyleneimine must have safety showers and eyewash stations located within the area, near, within sight of, and on the same level as where the material is located or used.
   
   C. The Secondary regulated area will be maintained under negative pressure with respect to the non-regulated areas.

2. **Define the Primary Regulated Area(s):** For the use of a listed carcinogen, a Primary Regulated Area within the Secondary Regulated Area must be designated, typically either an enclosed glove box or laboratory fume hood meeting the performance requirements described in the UCI Listed Carcinogen Program, Section VII, Definitions: Regulated Area.

   For storage of a Listed Carcinogen, the Primary Regulated Area may be defined by the Closed System containing the carcinogen’s primary container.

**Regulated Areas:**

<table>
<thead>
<tr>
<th>Building</th>
<th>Room</th>
<th>Equipment ID</th>
<th>Type*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Type = (R)oom, (F)ume hood, (G)love box, (O)ther Exhausted System, (C)losed System
3. **Post Warning Signs.** Regulated areas should be posted with a sign stating:

   **DANGER:**
   
   *(Chemical Name)*
   
   May Cause Cancer
   
   Authorized Personnel Only

   Postings should be made at all entrances to the Secondary Regulated Area(s). Primary Regulated Areas (fume hoods, gloveboxes, closed systems for storage, etc) as well as any cabinets/drawers/refrigerators where listed carcinogens are stored should be posted with warning sign.

4. **Prepare a Written Standard Operating Procedure.** SOP templates are available through CiBR-Trac or contact Chemical Safety ([chemsafety@uci.edu](mailto:chemsafety@uci.edu)) for additional assistance.

   An effective SOP should clearly address each of the following points.
   - Provide a description of the process.
   - Identity potential hazards of the materials and processes described.
   - Identify what approvals are required.
   - Designate the work area(s).
   - Describe special handling procedures and storage requirements.
   - Outline safe work practices including required personal protective equipment (PPE).
   - Indicate the engineering and ventilation controls used to mitigate exposure.
   - Provide spill and accident response procedures.
   - Outline waste disposal and decontamination procedures.
   - Describe a detailed description of the process steps.
   - Establish the required training documentation necessary to demonstrate proficiency and provide authorization.

If you have completed these four steps, please send the following information to Chemical Safety ([chemsafety@uci.edu](mailto:chemsafety@uci.edu)) to initiate the review of your request to procure a Listed Carcinogen.

   A. A completed copy of this Authorization Pre-Check.
   B. A copy of the listed carcinogen ordering information
   C. A copy of the listed carcinogen’s Standard Operating Procedure(s)
Appendix B: UCI Listed Carcinogen Use Registration

PI Name: ___________________________ Date: ___________________________
Lab Contact: ________________________ PI Signature: _______________________
Department: _________________________ Campus Extension: ___________________
Building and Room number: __________ Emergency Number: ___________________
Mailing Address: _____________________ ________________________________

Listed Carcinogen Information:
(Please list all listed carcinogens that are being used from Table 1)

<table>
<thead>
<tr>
<th>ID</th>
<th>Listed Carcinogen(s) (Cal/OSHA Section 5209)</th>
<th>CAS No.</th>
<th>Quantities</th>
<th>Concentration</th>
<th>Physical State</th>
<th>Frequency of Use*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Frequency of Use? (D)aily / (W)eekly / (M)onthly / (I)nfrequently

Regulated Area(s)*:

<table>
<thead>
<tr>
<th>Building</th>
<th>Room</th>
<th>Equipment ID</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All Regulated Areas must be approved prior to the start of any storage or work involving a listed carcinogen.

Personnel (Authorized Users) Handling Carcinogen(s)**:

<table>
<thead>
<tr>
<th>Name</th>
<th>UCI netID</th>
<th>Job Title Work Position</th>
<th>Collective bargaining unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Lab Operations Involving Carcinogens (check all applicable items):

- Heating
- Pressurized vessels
- Vacuum systems
- Other types of operations:

- Sonication
- Electrophoresis
- Blending
- Weighing
- Transferring
- Centrifuging
- Distillation
- Separation/extraction
- Other electrical systems

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

- Inhalation/respiratory
- Eye irritation
- Skin absorption/irritation
- Particulates
- Ingestion
- 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):

Surveyor: ____________________________

*To be filled out after a thorough survey has been performed
*A separate page to be completed for each individual chemical
UCI Listed Carcinogens Program

Appendix C: Listed Carcinogen Annual Self-Audit

Laboratory Information:

- PI Name: __________________________  Date: __________________________
- Lab Contact: _______________________  Campus Extension: ___________________
- Department: ________________________  Emergency Number: ___________________
- Building and Room: ___________________  Mailing Address: ___________________

Listed Carcinogen Information:

<table>
<thead>
<tr>
<th>ID</th>
<th>Listed Carcinogen(s) (Cal/OSHA Section 5209)</th>
<th>CAS No.</th>
<th>Quantities</th>
<th>Concentration</th>
<th>Physical State</th>
<th>Frequency of Use*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Frequency of Use? (D)aily / (W)eekly / (M)onthly / (I)nfrequently

Primary Regulated Area(s)*:

<table>
<thead>
<tr>
<th>Building</th>
<th>Room</th>
<th>Equipment ID/Type</th>
<th>Date Last Tested</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All Regulated Areas must be approved prior to the start of any storage or work involving a listed carcinogen.

Personnel (Authorized Users) Handling Carcinogen(s)**:

<table>
<thead>
<tr>
<th>Name</th>
<th>UCInetID</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**All personnel must be trained on the safe handling of carcinogens and have received medical clearance. Training records must be maintained and made available for review by EH&S and regulatory agencies.
UCI Listed Carcinogens Program

Procedural Audit Questions:

1. A. Has there been any changes in in the operations described in the laboratory’s Standard Operating Procedure for the material listed above?
   Yes. No.

   B. If yes, has the updated Standard Operating Procedure been submitted for review?
   Yes. No. If No, please submit an update of your Listed Carcinogen Use Registration.

2. A. Has the indicated listed carcinogen been used within the last year?
   Yes. No.

Verifications:

- The current Standard Operating Procedure for this listed Carcinogen is available in the laboratory, is posted and followed during work with the carcinogen.

- A current Safety Datasheet for the listed Carcinogen is available in the laboratory.

- The materials available to address minor spills and other emergencies involving the listed carcinogen are readily available in the laboratory and the location is known to the laboratory’s personnel.

- Only trained and qualified personnel are handling and manipulating the listed carcinogen as described in the laboratory procedures.

- Work, containment, and emergency procedures have been reviewed for their accuracy, sufficiency, and consistency with the approved protocols.

- The material logged in the Chemical Inventory (CiBR-Trac) is current and accurate.

PI Name: _____________________________ PI Signature: _____________________________

Please complete this Listed Carcinogen Self-Audit annually and submit to Chemical Safety (chemsafety@uci.edu).