

LISTED CARCINOGEN PROGRAM- External

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INTRODUCTION

Listed Carcinogens are a small group of regulated chemicals used in research laboratories. Environmental Health & Safety (EH&S) has developed this UCR Listed Carcinogens Program to 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 (<https://www.dir.ca.gov/title8/5209.html>). This program outlines the responsibilities of EH&S, the principal investigators, lab managers, and the staff and students whom they supervise.

OBJECTIVES

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 UCR 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.

SCOPE

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

Table 1. List of chemicals and their associated Chemical Abstracts Service (CAS) number. Mixtures less than the listed percent concentration (weight or volume) are not required to follow this program.

<i>Chemical</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, including:	92-87-5	0.1
Benzidine Acetate	36341-27-2	
Benzidine Dihydrochloride	531-85-1	
Benzidine Hydrochloride	14414-68-7	
Benzidine Sulfate	531-86-2	
3,3'-Dichlorobenzidine and its salts, including:	91-94-1	1.0
3,3-Dichlorobenzidine Dihydrochloride	612-83-9	
3,3-Dichlorobenzidine Dihydrogen Bis(sulfate)	64969-34-2	
4-Dimethylaminoazobenzene (Methyl yellow)	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 (MOM chloride)	107-30-2	0.1
Ethyleneimine	151-56-4	1.0

RESPONSIBILITIES

All users of Listed Carcinogens should be trained and familiar with this program in its entirety to ensure safety and compliance with Federal and State regulations. In addition to the responsibilities outlined in the campus [Chemical Hygiene Plan](#), the following groups must also:

Environmental Health and Safety (EH&S)

1. Support requests for new Listed Carcinogen purchases and uses that comply with regulatory requirements.
2. Conduct a risk assessment to support identification of compliant locations, mitigation controls, and safety procedures for proposed use of Listed Carcinogens.
3. Submit reports of use to the California Division of Occupational Safety and Health Occupational Carcinogen Control Unit upon initial use and any changes. See Appendix B.
4. Review campus inventory and use of Listed Carcinogens annually
5. Maintain a list of any individuals requiring medical surveillance due to their use of Listed Carcinogens, including regular medical monitoring to assess if exposure levels exceed established limits. For materials without Permissible Exposure Limits (PELs) or defined sampling methods, consult with the Occupational Health Physician – Toxicologist at University of California, Irvine Center for Occupational and Environmental Health (UCI COEH) to determine an appropriate sampling method.
6. Certify fume hoods used with Listed Carcinogens every 6 months

Facilities Services

1. Adjust laboratory fume hoods so that they have an average face velocity of 150 feet per minute (fpm) and a minimum of 125 fpm.
2. Maintain air balancing so that airflow in rooms with Listed Carcinogens is negative with respect to adjacent rooms.

Principal Investigators (PIs), Faculty or other Laboratory Supervisor

1. Notify EH&S whenever purchasing Listed Carcinogens and anytime there are changes to protocols involving Listed Carcinogens. This is done by completing a Listed Carcinogen Use Authorization.
2. Limit use of listed carcinogens to those that have current and documented training on:
 - a. *Carcinogen Safety* (<https://ucrllearning.ucr.edu/>, required once with no renewal)
 - b. Safety Data Sheets for all Listed Carcinogens in the lab
 - c. Written Standard Operating Procedures (SOPs) for Listed Carcinogens

3. Maintain that additional engineering controls, administrative controls, and personal protective equipment (PPE) as described in this document are available and in good working condition.
 - a. This includes paying recharges from Facilities Services to increase fume hood face velocities and air pressure balancing.
4. Schedule at least two people in the lab for times when Listed Carcinogens are being used.
5. Communicate emergency response and evacuation procedures specific to Listed Carcinogens to all lab members.
6. Address safety concerns when notified. If notification occurs via a lab safety evaluation, correct the concern within the time frame outlined in the lab safety evaluation report.
7. Retrain lab members upon any changes to SOPs.
8. Report any symptoms of potential exposure to listed carcinogens to EH&S.

Personnel Who Handle Listed Carcinogens (also known as Authorized Users)

1. Provide documentation confirming training completion
2. Learn all assigned responsibilities from the PI including maintaining a log for use, disposal of used PPE, maintenance of engineering controls and storage.
3. Use the additional engineering controls, administrative controls, and PPE as described in this document.
4. Report the involvement of listed carcinogens in any spill that occurs while handling listed carcinogens to PI and EH&S.
5. Report any symptoms of potential exposure to listed carcinogens to their supervisor and EH&S and contact occupational health for any medical follow ups.

Personnel Who Occupy Rooms Where Listed Carcinogens are Used or Stored

1. Provide documentation confirming understanding of emergency response and evacuation procedures specific to Listed Carcinogens.
2. Be able to identify Regulated Areas in the lab and describe unauthorized access to those areas.
3. Report any symptoms of potential exposure to listed carcinogens to their supervisor and EH&S and contact occupational health for any medical follow ups.

PROCUREMENT, REGISTRATION, AND AUTHORIZATION FOR USE

1. PI submits the Listed Carcinogen Use Authorization form found in Appendix A and the [Cal OSHA Report of Use Form](#).
2. After EH&S approves, PI submits purchase request
3. PI or delegate adds the chemical carcinogen into the [campus online chemical](#) inventory upon receipt
4. PI or delegate schedules preliminary exposure monitoring with [EH&S Industrial Hygiene](#).
5. If exposure monitoring exceeds the action level or permissible exposure limit of the listed carcinogen, work with EH&S to minimize exposure levels and/or enroll into the campus medical surveillance program.
6. Notify EH&S within 5 days of any changes to a listed carcinogen's possession, location, and/or users.
7. Authorized user(s) posts the Listed Carcinogen Use Authorization Form while the chemical is in use.

USE REQUIREMENTS

In addition to the necessary work practices outlined in the campus [Chemical Hygiene Plan](#), the lab must implement additional controls when using Listed Carcinogens.

Additional Engineering Controls

1. Fume hoods must have an average face velocity of 150 fpm and a minimum of 125 fpm, and inspected by EH&S at a minimum every six months.
2. Laboratory vacuum systems shall be protected with high efficiency scrubbers or with disposable absolute filters capable of retaining 99.97 percent of a mono disperse aerosol of 0.3 micrometer particles (HEPA filters). Only high efficiency scrubbers shall be used with beta-propiolactone, bis-chloromethyl ether, methyl chloromethyl ether, or ethyleneimine.
3. Work surfaces must be protected from contamination using plastic-backed absorbent material or similar.
4. There shall be no connection between regulated areas and any other areas through the ventilation system.

Additional Administrative Controls

1. Training:
 - a. *Carcinogen Safety* (<https://ucrllearning.ucr.edu/>, required once with no renewal)
 - b. Safety Data Sheets for all Listed Carcinogens in the lab
 - c. Written Standard Operating Procedures (SOPs) for Listed Carcinogens
 - d. Training is required prior to the employee's initial work with Listed Carcinogens.
2. Signs and labels:
 - a. An established designated area for work with Listed Carcinogens
 - b. Entrances to designated Listed Carcinogen work areas (Regulated Areas) should be posted with a sign stating:

DANGER
(CHEMICAL IDENTIFICATION)
MAY CAUSE CANCER
AUTHORIZED PERSONNEL ONLY
 - c. Primary containers must be labeled with the following information:
 - i. Chemical name
 - ii. Hazard warnings (GHS symbols ok)
 1. "DANGER: May Cause Cancer"
 - iii. Date received (if container was generated in lab, date created)
 - iv. Name of researcher in charge (initials ok)
 - d. Secondary containers, storage cabinets, glove boxes, and fume hoods containing Listed Carcinogens should be labeled with the following information:
 - v. Name of the carcinogen(s)
 - vi. "DANGER: May Cause Cancer";
 - vii. Other hazard warnings such as corrosive, flammable etc.;
 - e. In cleanup of leaks or spills, maintenance or repair operations on contaminated systems or equipment, or any operations involving work in an area where unmitigated contact with a carcinogen could result, the following sign must be posted on entrances:

DANGER

**Chemical Identification
May Cause Cancer
Wear Air-Supplied Hoods, Impervious Suits, and Protective Equipment In This Area
Authorized Personnel Only**

3. Work practices
 - a. Daily:
 1. Access shall be restricted to authorized users only.
 2. Wash hands, forearms, face, and neck upon removal of gloves and after each use of a Listed Carcinogen and exit from a Regulated Area such as a lab space.
 3. Wear a daily change of clean, protective laboratory clothing such as a fully buttoned laboratory coat.
 - a. When clothing decontamination methods are not known or are not practical, disposable protective clothing should be worn.
 - b. As Needed:
 1. Certain 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. These activities are:
 - 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.
 2. Employees shall be required to wash hands, forearms, face and neck on each exit from the regulated area, after the last exit of the day except in those cases in which the substance is beta-propiolactone, bis-chloromethyl ether, methyl chloromethyl ether, or ethyleneimine.
 - c. In case of emergency/exposure:
 1. Remove clothing contaminated by Listed Carcinogens immediately. Place contaminated clothing in double plastic bags, labeled with the name of the carcinogen and dispose as hazardous chemical waste.
 2. Seek medical attention immediately upon any signs or symptoms related to exposure. Notify your supervisor and [submit an EH&S Incident Report](#).
4. Waste Management
 - a. 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.
 - b. Before requesting a waste pick-up:
 1. Segregate carcinogen waste from other waste;
 2. 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 secondary container.
 3. Waste must be labeled with a standard Hazardous Waste label that includes the statement "DANGER: MAY CAUSE CANCER" in the comment field.
 4. Submit chemical waste pick-up requests via WASTe.
 5. Mixed chemical and radiological or biological wastes require special consideration. Contact the [EH&S Hazardous Materials team](#) for guidance.

Additional Personal Protective Equipment

5. Disposable gloves and sleeves are required when entering a Regulated Area. A disposable apron is recommended in case of a splash.
6. 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.

Additional Controls when using Listed Carcinogens in Animal Research

1. Disclose use of Listed Carcinogens in IACUC Animal Use Protocol application and on any cage cards that hold animals that have been exposed to hazardous material with the name of the material and date it was administered.
2. Employees working with animals in conjunction with Listed Carcinogens shall be required to shower, including washing of the hair, after the last exit of the day from a Regulated Area.
3. Employees working with animals in conjunction with Listed Carcinogens are required to wear a daily change of clean, protective clothing which includes coveralls or pants and shirt, foot covers, head covers, gloves, and appropriate protective respiratory equipment or devices.
4. 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.

ANNUAL REVIEW

Principal Investigators with Listed Carcinogens are required to conduct an annual review that includes:

1. Checking engineering controls (e.g. chemical fume hood, glove box, local exhaust) and other safety equipment;
2. Verifying that the Safety Protocol is posted and followed;
3. Verifying that a current Safety Data Sheet for the carcinogen is available;
4. Verifying that materials required to cope with minor spills and other emergencies are readily available;
5. Verifying that only suitably trained and qualified personnel are performing the procedures
6. Reviewing work practices, containment, and emergency procedures for accuracy, sufficiency, and consistency with approved protocols;
7. Certifying the lab's chemical inventory

MEDICAL SURVEILLANCE

Please see the [Chemical Hygiene Plan Chemical Exposure Assessment Section](#) for medical evaluation and medical surveillance information. Contact the Occupational Health Team (ehsocchealth@ucr.edu) for questions about medical surveillance.

DEFINITIONS

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:

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

Absolute Filter:

A high-efficiency particulate air filter (HEPA) capable of retaining 99.97 percent or greater of a mono disperse aerosol of 0.3 micrometers in size (HEPA).

Decontamination:

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

Face velocity:

Average linear air velocity, typically measured in liner feet per minute (fpm), into the exhaust system measured at the opening of a fume hood.

High Efficiency Scrubber:

Pollution control device, typically a wet scrubber, designed to remove over 99% of fine, sub-micron particulates and hazardous gaseous pollutants from exhaust gas streams.

Regulated Area:

An area where entry and exit is restricted and controlled.

APPENDIX A: CAL/OSHA LISTED CARCINOGEN USE AUTHORIZATION FORM



Environmental Health, Safety and Risk Management

Listed Carcinogen Use Authorization Form

Complete this form when planning to use materials regulated by California Code of Regulations, Title 8, Section 5209. Carcinogens

edeguzma@ucr.edu [Switch account](#)



The name, email, and photo associated with your Google account will be recorded when you upload files and submit this form

* Indicates required question

Email *

Your email

Name of Principal Investigator *

Your answer

APPENDIX B: DIVISION OF OCCUPATIONAL SAFETY AND HEALTH ASBESTOS AND CARCINOGEN UNIT REPORT OF USE OF REGULATED CARCINOGENS FORM

STATE OF CALIFORNIA

Gavin Newsom, Governor

DEPARTMENT OF INDUSTRIAL RELATIONS
Division of Occupational Safety and Health
Asbestos and Carcinogen Unit
 1750 Howe Avenue, Suite 460
 Sacramento, CA 95825
 (916) 574-2993 Office

<http://www.dir.ca.gov/dosh/asbestos.html> acru@dir.ca.gov



Report of Use Number:

REPORT OF USE OF REGULATED CARCINOGENS

Title 8 California Code of Regulations section [5203](#) requires reporting the use of regulated carcinogens to the Division of Occupational Safety and Health. The list below indicates those carcinogens currently regulated and references the appropriate Title 8 Section numbers (in bold) for each regulated carcinogen. Completion of the information below meets these requirements for Report of Use.

Any change in location, use, additions, or deletions of carcinogens used in your workplace, must be reported within 15 calendar days.

A copy of each written report required by the section is required to be posted in the locations where the carcinogens are present in the workplace or in another appropriate location where the posting is conspicuous to employees.

- | | |
|--|--|
| ☐ 2-Acetylaminofluorene 5209 | ☐ Silica, 1532.3, 5204 |
| ☐ 4-Aminodiphenyl | ☐ Beryllium, 1535.1, 5205, 8359.1 |
| ☐ Benzidine (and its salts) | ☐ Chromium, 5206, 1532.2, 8359 |
| ☐ 3,3'-Dichlorobenzidine (and its salts) | ☐ Cadmium, 1532, 5207 |
| ☐ 4-Dimethylaminoazobenzene | ☐ Asbestos, 1529, 5208, 8358 |
| ☐ alpha-Naphthylamine | ☐ Non-asbestiform Tremolite, Anthophyllite, Actinolite, 5208.1 |
| ☐ beta-Naphthylamine | ☐ Vinyl Chloride, 5210 |
| ☐ 4-Nitrobiphenyl | ☐ Coke Oven Emissions, 5211 |
| ☐ N-Nitrosodimethylamine | ☐ 1,2-Dibromo-3-Chloropropane (DBCP), 5212 |
| ☐ beta-Propiolactone | ☐ Acrylonitrile, 5213 |
| ☐ bis-Chloromethyl ether | ☐ Inorganic Arsenic, 5214 |
| ☐ Methyl chloromethyl ether | ☐ 4,4'-Methylenebis(2-Chloroaniline) (MBOCA), 5215 |
| ☐ Ethyleneimine | ☐ Formaldehyde, 5217 |
| ☐ Methylenedianiline (MDA), 1535, 5200 | ☐ Benzene, 5218 |
| ☐ 1,3 Butadiene, 5201 | ☐ Ethylene Dibromide (EDB), 5219 |
| ☐ Methylene Chloride, 5202 | ☐ Ethylene Oxide (EtO), 5220 |

Employer/Company and Division Name

Telephone Number

Address

City

County

Zip

If there has been a change, write the previous name; address; date, & report number if known

Original Signature

Print Name and Title of Employer Representative

Date

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Provide the information in items 1 through 6 below for each carcinogen checked on page one.

If there are multiple carcinogens checked on page one, make extra copies of this page and indicate here the name of the Carcinogen the information is for _____

1. A brief description of each process or operation, which may result in employee exposure to the carcinogen.

2. The location in the workplace where the carcinogen is present or used.

3. The number of employees engaged in each process or operation.

4. The name and address of any collective bargaining representative(s), or other representatives of the employees.

5. A brief description of the quantities of carcinogen present or used.

6. Nature of Business: Indicate the Standard Industrial Classification (SIC) or North American Industry Classification System (NAICS) code, see <http://www.census.gov/epcd/www/naics.html> or if the SIC or NAICS are unknown, what is the type of industry and principal product(s).

When completed this form should be emailed to actu@dir.ca.gov and mailed via U.S. Postal Service to the Division of Occupational Safety and Health at:

DOSH-Asbestos and Carcinogen Unit
PO Box 420603
San Francisco, CA 94142

(If you also need to report a temporary worksite location see section [5203](#) (e) and/or report an emergency see section [5203](#) (f) for additional reporting requirements)

Cal OSHA 183A (Revised 01/2019)