
UCLA Policy 907: Safe Handling of Particularly Hazardous Substances

Issuing Officer: Vice Chancellor for Research & Creative Activities
Responsible Department: Environment, Health & Safety
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I. PURPOSE

This Policy describes UCLA's commitment to protecting laboratory workers from the hazards of chemicals that Cal/OSHA has designated as "particularly hazardous substances." Particularly hazardous substances are defined by Cal/OSHA as: reproductive toxins, acutely toxic substances and select carcinogens, which include regulated carcinogens. Refer to Attachment A, Particularly Hazardous Substances Definitions, for specific definitions.

II. STATEMENT

This Policy commits all UCLA laboratory workers (i.e., Principal Investigators, laboratory personnel, students, visiting researchers, etc.) who use or work with particularly hazardous substances to follow the requirements on handling particularly hazardous substances found in UCLA's Chemical Hygiene Plan (<https://ucla.app.box.com/v/UCLA-Chemical-Hygiene-Plan>). Careful handling and stringent controls of these chemicals are essential to protect workers and the environment.

III. RESPONSIBILITIES

Preventing workplace injuries, exposures, and illnesses is the responsibility of every member of the campus community. Specific responsibilities are assigned to more senior members of the research and teaching community in order to implement and ensure compliance with this Policy by their personnel.

The Chancellor has overall responsibility for compliance with health and safety requirements at all facilities and programs under campus control.

The Vice Chancellor for Research & Creative Activities is responsible for the implementation of this Policy in all applicable research and teaching laboratories within their jurisdiction.

The UCLA Chemical and Physical Safety Committee (CPSC) is responsible for promoting a safe working environment in all research and teaching laboratories on campus, and for developing, updating and maintaining policies applicable to the health and safety of laboratory work.

Department Chairpersons are responsible for communicating, promoting, and enforcing this Policy in their respective research and teaching areas.

Principal Investigators and laboratory management staff are responsible for complying with this Policy and ensuring their laboratory personnel receive appropriate training and comply with this Policy as it relates to their research and teaching activities.

All Laboratory Personnel working in laboratory areas are responsible for following laboratory safety requirements, including how to work safely with substances designated as particularly hazardous.

The UCLA Office of Environment, Health & Safety (EH&S) is responsible for inspection of laboratories and for campus compliance with this Policy. In cases where laboratory activities pose an immediate danger to life or health, designated EH&S staff have the responsibility and authority to order the temporary cessation of the

activity until the hazardous condition is abated.

The UCLA Chemical Hygiene Officer (CHO) is responsible for developing guidance for working safely with particularly hazardous substances, including procedures, equipment, personal protective equipment, and work practices that are capable of protecting laboratory personnel from exposure. The CHO is also responsible for verifying implementation of these guidelines and for reporting on compliance with this Policy to the Chemical and Physical Safety Committee.

IV. LABORATORY SAFETY REQUIREMENTS & PROCEDURES

A. Laboratory Specific Standard Operating Procedures

1. Individual laboratory groups must prepare and maintain laboratory-specific standard operating procedures (SOP) for handling particularly hazardous substances to avoid exposure. EH&S will include specific guidance for developing SOPs in the Chemical Hygiene Plan.
2. A copy of the particularly hazardous substances procedures, including laboratory specific information, and the Safety Data Sheets (SDS) for the chemical(s) used must be readily accessible in each lab where they are used.
3. EH&S must be notified immediately via the EH&S Hotline at 310-825-9797 if members of the laboratory become ill or exhibit signs or symptoms associated with exposure to particularly hazardous substances used in the laboratory. Affected employees must be provided with immediate first aid and medical surveillance within 24 hours of the event.
4. Principal Investigators must identify what classes of particularly hazardous substances are in use in their labs on their Laboratory Hazard Assessment, their Safety Management Plan, or other form as designated by EH&S. Updates must be completed as particularly hazardous substances are introduced to, or removed from the laboratory.

B. Training and Documentation

1. All laboratory personnel who work with or may be exposed to particularly hazardous substances must be provided laboratory-specific training and information by the Principal Investigator or their designee prior to beginning their initial assignment. Laboratory-specific training should cover the procedures that have been approved by the Principal Investigator and is in addition to the basics covered in the Laboratory Safety Fundamental Concepts training. Records of laboratory-specific training must be maintained in the laboratory and must include a description of the topics covered. See <https://ucla.app.box.com/v/lab-directed-training-record> for a sample documentation form.

Training must include:

- The hazards/toxicological effects associated with the chemicals being used.
 - Routine procedures and decontamination methods.
 - Emergency response practices and procedures.
 - Methods and observations for detecting the presence or release of hazardous chemicals.
 - Available protection measures, including appropriate work practices, and personal protective equipment (PPE).
 - A review of written SOPs, SDSs, and the Chemical Hygiene Plan (CHP).
 - A review of this Policy.
2. All laboratory personnel are responsible for knowing and complying with all safety guidelines, regulations, and procedures required for the task assigned and for reporting unsafe conditions, accidents, or near misses to the Principal Investigator, immediate laboratory management staff, or EH&S.
 3. Continuing training will be conducted as needed to maintain a working knowledge of hazards and the safety requirements for all laboratory personnel who work with particularly hazardous substances, including an annual refresher for particularly hazardous substances. Written records must be maintained for each training session. See <https://ucla.app.box.com/v/lab-directed-training-record> for a sample documentation form.

C. Use in Designated Areas

1. Designated area(s) for use of particularly hazardous substances must be formally established by developing SOPs and posting appropriate signage. Designated area(s) may be an entire laboratory, a specific work bench, a chemical fume hood, or any area(s) that are designated for use of hazardous substances. When particularly hazardous substances are in use, access to the designated area will be limited to personnel following appropriate procedures and who are trained in working with these chemicals.
2. Access to areas where particularly hazardous substances are used or stored must be controlled by trained employees. It is the responsibility of each Principal Investigator or their designee, to train and authorize their staff for these operations and to maintain documentation of this training and authorization.
3. Signage is required for all containers, designated work areas, and storage locations. Sign wording should include appropriate pictograms and identify the hazards of the particularly hazardous substance (e.g., "select carcinogens," reproductive toxins, or substances which have a high degree of acute toxicity). Entrances to designated work areas and storage locations must include signage, "AUTHORIZED PERSONNEL ONLY", in addition to the above specific hazard warning wording. Signage for laboratories can be obtained by contacting EH&S and completing an NFPA 704 placarding form (<https://ucla.app.box.com/v/DoorCardRequest>) to doorcards@ehs.ucla.edu.
4. Work surfaces must be impervious to the particularly hazardous substance being used and easy to decontaminate or dispose of (e.g., stainless steel or chemically resistant epoxy surfaces, plastic trays, or dry absorbent plastic backed paper).
5. Protocols, procedures, and experiments must be designed and performed in a manner to safely maintain control of the particularly hazardous substances. Laboratory personnel must specifically consult with their Principal Investigators if a special hazard is involved (e.g., material under pressure) or if they are uncertain of the potential hazards.

D. Personal Protective Equipment (PPE)

1. PPE must be sufficient to protect eyes and skin from contact with the hazardous agents. Specific mandatory guidance for PPE selection when working with hazardous materials, including particularly hazardous substances, is described in UCLA Policy 905, Research Laboratory Personal Safety and Protective Equipment, the Chemical Hygiene Plan, and must be included in the specific chemical's SOP. The chemical's Safety Data Sheets may be a reference for specific PPE requirements (section 8).
2. Contaminated PPE and clothing must be disposed of or decontaminated prior to removal from the designated work area. Refer to UCLA Policy 905 and the Chemical Hygiene Plan for guidance on handling contaminated protective apparel and other PPE.

E. Engineering Controls

1. Benchtop work with particularly hazardous substances should be avoided whenever practical in favor of contained systems (such as fume hoods or glove boxes) and is not permitted if there is a reasonable likelihood of workers exceeding regulatory exposure limits. For questions regarding exposure limits and for assistance in conducting a hazard assessment for uncontained procedures, contact EH&S at laboratorysafety@ehs.ucla.edu.
2. Laboratories and rooms where particularly hazardous substances are used must have general room ventilation that is maintained at negative pressure with respect to public areas. Air from these ventilation systems must be vented externally; recirculation is not permitted. Doors providing access from public areas must be kept closed.

F. Special Handling & Storage Requirements

1. Particularly hazardous substances must be stored in a designated area and used in a manner that will minimize the risk of accidental release. Laboratory personnel should remove chemicals from storage only as needed and return them to storage as soon as practical.
2. Storage of particularly hazardous substances must also be in accordance with guidance regarding incompatible materials as described in the Chemical Hygiene Plan and the SDS for the specific chemical.
3. The use of particularly hazardous substances must be confined to an established designated area (see C. Use in Designated Areas, above).

4. When transporting chemicals beyond the immediate laboratory environment, containers of particularly hazardous substances must be protected from breakage by using a bottle carrier or other effective secondary containment.
5. Contact the EH&S Chemical Safety email at laboratorysafety@ehs.ucla.edu for guidance on the planned use of chemicals that may require further controls.

G. Spill & Accident Procedures

1. Immediate measures must be available to prevent the possible spread of contamination in the event of a small spill of a particularly hazardous substance. Sufficient spill materials to contain a particularly hazardous substance spill and to decontaminate affected individuals, equipment, and areas must be available in all laboratories that store particularly hazardous substances. Any known spills must be contained and decontaminated as soon as possible in accordance with the chemical-specific SDS.
2. In the event of a large spill that is beyond a laboratory group's immediate response capabilities, the following procedures must be followed:
 - a. Evacuate the area immediately.
 - b. Restrict access to the affected areas, post signage and barriers as needed to prevent unauthorized entry.
 - c. Call 911.
3. Follow procedures detailed in the Chemical Hygiene Plan to report the spill to EH&S.
4. In the event of a spill or release that causes direct exposure to a particularly hazardous substance, follow procedures detailed in the Chemical Hygiene Plan. This includes use of an eyewash and/or safety shower for exposures to the eyes and/or skin.

H. Routine Decontamination Procedures

1. Refer to the Chemical Hygiene Plan and relevant laboratory SOPs for requirements and recommendations regarding routine decontamination of laboratory work surfaces where particularly hazardous substances are handled.
2. All equipment must be decontaminated before removing it from the designated area; this decontamination should be carried out in a glove box or fume hood where practical.
3. Contaminated PPE must not be removed from the designated area until properly decontaminated or bagged as hazardous waste; refer to UCLA Policy 905 and the Chemical Hygiene Plan for guidance on the cleaning or disposal of protective apparel and other PPE. After working with these chemicals, gloves must immediately be removed and disposed of as hazardous waste and hands and arms washed with soap and water.

I. Waste Disposal Procedures

1. Disposal of waste materials that include particularly hazardous substances must comply with the hazardous chemical waste disposal procedures found in the Chemical Hygiene Plan.
2. All non-radioactive chemical waste must be disposed of through the UCLA Hazardous Chemical Waste Program. Mixed wastes of hazardous chemicals and radioactive material are disposed of through the Radiation Safety Department. Due to regulatory restrictions and the high cost of disposal, the Radiation Safety Department should be contacted prior to producing mixed wastes.

J. Regulated Carcinogens and Report of Use Requirements

1. Regulated carcinogens are a specific subset of select carcinogens which have special additional requirements associated with their use under certain circumstances. See Attachment B for the specific list. EH&S maintains an air sampling program to monitor individuals to determine if they are, or may reasonably be expected to, exceed short- or long-term exposure limits. If levels cannot be kept below these levels, additional requirements may include:
 - Required medical evaluations.
 - Additional documented training.
 - Use of respirators with required initial and ongoing training, medical evaluations, and maintenance documentation.
 - Additional documented hazard evaluations.
2. Listed carcinogens are a further subset of regulated carcinogens. See Attachment C for the specific list. The

use of these materials must be registered with EH&S through the Laboratory Hazard Assessment, Safety Management Plan, or other equivalent EH&S approved process. An evaluation will be completed to assess safety requirements for groups that use these materials.

Report of Use Requirements must be met for each group when they:

- Begin the use of, or make significant changes to existing use of any listed carcinogen.
- Use regulated carcinogens such that there is a reasonable expectation that exposure limits may be exceeded.
- In the event of an emergency in which employees have been exposed to any regulated carcinogen.

V. REFERENCES

1. Title 8, California Code of Regulations (CCR), Section 5191 (Occupational Exposures to Hazardous Chemicals in Laboratories; Article 110 (Regulated Carcinogens); Section 5209 (Listed Carcinogens); Section 5203 (Report of Use Requirements); Section 5154.1 (Ventilation Requirements for Laboratory-Type Hood Operations);
2. UCLA Policy 905, Research Laboratory Personal Safety and Protective Equipment;
3. UCLA Policy 811, Environmental Health and Safety;
4. UCLA Chemical Hygiene Plan.

VI. ATTACHMENTS

- A. Particularly Hazardous Substances Definitions
- B. Regulated Carcinogens
- C. Listed Carcinogens

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Issuing Officer
Roger Wakimoto
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Vice Chancellor for Research & Creative Activities

**Questions concerning this policy or procedure should be referred to
the Responsible Department listed at the top of this document.**

ATTACHMENT A

Particularly Hazardous Substances Definitions

Particularly hazardous substances fall into the following three major categories: acute toxins, reproductive toxins and carcinogens.

Acute Toxins

Substances that have a high degree of acute toxicity are substances that may be fatal or cause damage to target organs as the result of a single exposure or exposures of short duration. They can be defined as:

1. A chemical with a median lethal dose (LD50) of 50 mg or less per Kg of body weight when administered orally to albino rats weighing between 200 and 300 gm each;
2. A chemical with a median lethal dose (LD50) of 200 mg or less per Kg of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 Kg each; and
3. A chemical that has a median lethal concentration (LC50) in air of 5000 ppm by volume or less of gas or vapor, or 50 mg per liter or less of mist, fume, or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 gm each.

Reproductive Toxins

Reproductive toxins include any chemical that may affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis). A list of reproductive toxins is maintained online at <https://oehha.ca.gov/proposition-65/proposition-65-list>.

Carcinogens

Carcinogens are chemical or physical agents that cause cancer. Generally, they are chronically toxic substances; that is, they cause damage after repeated or long-duration exposure, and their effects may only become evident after a long latency period.

The term “regulated carcinogen” means a recognized cancer-causing substance, compound, mixture, or product regulated by Cal/OSHA sections 1529, 1532, 1532.2, 1535, 8358, 8359 or Article 110, sections 5200-5220. *See Attachment B for the specific list of Regulated Carcinogens.*

The term “Listed Carcinogen” refers to a specific list of 13 chemicals regulated by Cal/OSHA and Federal OSHA and has specific use and handling requirements. *See Attachment C for the specific list of Listed Carcinogens.*

The term “select carcinogen” refers to a category of chemicals where the available evidence strongly indicates that the substances cause human carcinogenicity. A select carcinogen meets one of the following criteria:

1. It is regulated by Cal/OSHA as a carcinogen; or
2. It is listed under the category “known to be carcinogens” in the annual report by the National Toxicology Program (NTP); or
3. It is listed under Group 1 – “carcinogenic to humans” – by the International Agency for Research on Cancer (IARC); or
4. It is listed in either Group 2A or Group 2B by the IARC or under the category “reasonably anticipated to be carcinogens” by the NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria:
 - a. After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³;
 - b. After repeated skin application of less than 300 mg/kg of body weight per week; or
 - c. After oral dosages of less than 50 mg/kg of body weight per day.

ATTACHMENT B
Regulated Carcinogens

The term “regulated carcinogen” means a recognized cancer-causing substance, compound, mixture, or product regulated by Cal/OSHA sections 1529, 1532, 1532.2, 1535, 8358, 8359 or Article 110, sections 5200-5220. For more information, see UCLA Policy 907.

- Acrylonitrile
- Arsenic metal and inorganic arsenic compounds
- Asbestos
- Benzene
- 1,3-butadiene
- Cadmium metal and cadmium compounds
- Chromium(VI) compounds
- Coke Oven Emissions
- 1,2-Dibromo-3-chloropropane (DBCP)
- Ethylene Dibromide (EDB)
- Ethylene Oxide (EtO)
- Formaldehyde gas and formaldehyde solutions
- Lead metal and inorganic lead compounds
- Methylene Chloride
- 4,4'-Methylene bis(2-chloroaniline) (MBOCA)
- Methylenedianiline (MDA)
- Vinyl Chloride
- 2-Acetylaminofluorene
- 4-Aminodiphenyl
- Benzidine (and its salts)
- 3,3'-Dichlorobenzidine (and its salts)
- 4-Dimethylaminoazobenzene
- alpha-Naphthylamine
- beta-Naphthylamine
- 4-Nitrobiphenyl
- N-Nitrosodimethylamine
- beta-Propiolactone
- bis-Chloromethyl ether
- Methyl chloromethyl ether
- Ethyleneimine

ATTACHMENT C
Listed Carcinogens

The term “listed carcinogen” refers to a specific list of 13 chemicals regulated by Cal/OSHA and Federal OSHA and has specific use and handling requirements. For more information, see UCLA Policy 907.

- 2-Acetylaminofluorene
- 4-Aminodiphenyl
- Benzidine (and its salts)
- 3,3'-Dichlorobenzidine (and its salts)
- 4-Dimethylaminoazobenzene
- alpha-Naphthylamine
- beta-Naphthylamine
- 4-Nitrobiphenyl
- N-Nitrosodimethylamine
- beta-Propiolactone
- bis-Chloromethyl ether
- Methyl chloromethyl ether
- Ethyleneimine