**Chemical Hygiene Plan Signature page**

All researchers are required to read and understand the CHP prior to working with hazardous chemicals. <http://www.ehs.uci.edu/programs/lsg/UCI_CHP.pdf>

PI’s name:……………………………………………….. PI’s signature………………………….. Date:……………

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| No. | Lab Personnel Full Name | UCInet ID | Signature | Date |
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UCI Chemical Hygiene plan overview

1. Responsibilities of All Personnel who Handle Potentially Hazardous Chemicals
2. Review and follow requirements of the CHP and all appropriate Safety Manuals and Policies;
3. Follow all verbal and written laboratory safety rules, regulations, and standard operating procedures required for the tasks assigned;
4. Develop good personal chemical hygiene habits, like keeping the work areas safe and uncluttered;
5. Plan, review and understand the hazards of materials and processes in laboratory research or other work procedures prior to conducting work;
6. Utilize appropriate measures to control identified hazards, including consistent and proper use of engineering controls, personal protective equipment, and administrative controls;
7. Understand the capabilities and limitations of PPE issued to you;
8. Gain prior approval from the PI/Laboratory Supervisor for the use of restricted chemicals and other materials;
9. Consult with PI/Laboratory Supervisor before using any particularly hazardous substances (PHS), pyrophoric chemicals, explosives and other highly hazardous materials or conducting certain higher risk experimental procedures;
10. Immediately report all accidents and unsafe conditions to the PI/Laboratory Supervisor and EH&S;
11. Complete all required health, safety and environmental training and provide written documentation to supervisor;
12. Participate in the medical surveillance program, when required (if exposure takes place);
13. Inform the PI/Laboratory Supervisor of any work modifications ordered by a physician as a result of medical surveillance, occupational injury or exposure;
14. When working autonomously or performing independent research or work:
	1. Review the plan or scope of work for proposed research with the PI/Laboratory Supervisor
	2. Notify in writing and consult with the PI/Laboratory Supervisor, in advance, if you intend to significantly deviate from previously reviewed procedures (Note: Significant change may include, but is not limited to, change in the objectives, change in PI, change in the duration, quantity, frequency, conditions or location, increase or change in PPE, and reduction or elimination of engineering controls.)
	3. Prepare SOPs and perform literature searches relevant to safety and health that are appropriate for your work;
	4. Provide appropriate oversight, training and safety information to laboratory or other personnel you supervise or direct.
15. **CHEMICAL HAZARD COMMUNICATION**
16. Maintain an updated inventory;
17. Identify which chemicals are hazardous;
18. Make sure SDS (Safety Data Sheets) are available (hard copy or electronic);
19. Label properly all purchased or prepared chemicals (chemical name, hazard class, date);
20. Receive training on workplace hazards at the time of initial assignment or when a new hazard is introduced;
21. Review, certify the LHAT (Laboratory Hazard Assessment Tool).
22. **CLASSES OF HAZARDOUS CHEMICALS**
23. Identify and assign the correct hazard class to each chemical in order to determine safe storage and handling:
24. Flammability hazard;
25. Reactivity hazard;
26. Health hazard (corrosive, irritant, sensitizer, toxic, carcinogen, mutagen).
27. **HOW TO REDUCE EXPOSURES TO HAZARDOUS CHEMICALS**
	* + 1. Routes of exposure:
	1. Inhalation;
	2. Absorption;
	3. Ingestion;
	4. Injection.
		* 1. Safety Controls:
28. Engineering;
29. Administrative;
30. Protective apparel and equipment.
	* + 1. Safe Laboratory Habits
31. Use of PPE;
32. Chemical handling;
33. Equipment handling;
34. Laboratory operations;
35. Food and drinks.
36. **CHEMICAL EXPOSURE ASSESSMENT**
37. When an exposure assessment is needed:
38. EH&S can determine the need after reviewing the chemical inventory or other physical hazard in the laboratory in combination with the SOPs used as well as engineering and administrative controls in place;
39. User expresses concern about the ineffectiveness of engineering and administrative controls during a procedure;
40. A regulatory standard deems mandatory.
41. Steps followed:
42. Employee interviews;
43. Visual observation of chemical usage and/or laboratory operations;
44. Evaluation of simultaneous exposure to multiple chemicals;
45. Evaluation of potential for absorption through the skin, mucus membranes or eyes;
46. Evaluation of existing engineering controls;
47. Use of direct reading instruments;
48. Collection of analytical samples;
49. Notification of employee and supervisor of results;
50. Medical evaluation if needed (development of signs or symptoms, exposure levels above limits, uncontrolled event takes place, reasonable request from employee);
51. Physician’s confidential written opinion (recommendations, results, medical condition revealed, statement to employee);
52. Medical surveillance.
53. **INVENTORY, LABELING, STORAGE, AND TRANSPORT**
54. Chemical Inventories:
55. Maintain current with chemicals and compressed gases;
56. Review prior to placing an order for a new chemical;
57. Dispose old chemicals and chemicals that are no longer needed;
58. Control access to high hazard chemicals.
59. Chemical Labeling:
60. Any chemical purchased or prepared in the laboratory must be properly labeled;
61. Peroxide forming chemicals must be labeled on date received and date opened;
62. PHS must have additional labeling to identify specific hazard (carcinogen, acutely toxicant, reproductive toxin), storage must be labeled as well.
63. Chemical Storage and Segregation:
64. Flammables in flammable cabinets or refrigerators away from combustibles or ignition sources (no more than 60 gallons in each cabinet and no more than 3 cabinets per room);
65. Strong Oxidizers away from flammables and organic compounds;
66. Acids and bases away from each other and below shoulder height always in secondary containers;
67. Water and air reactive chemicals in secondary containers when out of special enclosures (glove-box, desiccator);
68. Compressed gases restrained by two chains and capped when not in use.
69. Transport:
70. Use break-resistant secondary containers for transportation around campus;
71. Off campus transport requires training and certification by EH&S.
72. **TRAINING**
73. Types and Requirements:
74. Two types of training, general lab safety (general practices) and lab specific (specific techniques and equipment);
75. Training has to be completed before beginning work, prior to a new exposure situation, and as work conditions change;
76. Documentation needs to be maintained in the Laboratory Safety Binder.
77. **INSPECTIONS AND COMPLIANCE**
78. Laboratory Safety Inspections:
79. Conduct periodically;
80. Ensure safety by identifying existing and potential hazards;
81. Identify infrastructure weaknesses;
82. Ensure compliance with federal, state, and university rules and regulations;
83. Notify and keep accountable PI/Lab Supervisor of findings;
84. Correct in a timely manner;
85. Maintain records in Laboratory Safety Binder.
86. **HAZARDOUS CHEMICAL WASTE MANAGEMENT**
87. Definition of Hazardous Waste
88. Ignitable: Flash point below 140oF, oxidizer, cause fire through friction, absorption of moisture, spontaneous chemical changes;
89. Corrosive: pH less or equal to 2 or greater or equal to 12.5;
90. Reactive: unstable and readily undergoes violent changes;
91. Toxic: oral LD50 less than 2,500mg/kg, dermal LD50 less than 4,300mg/kg, inhalation LC50 less than 10,000ppm;
92. Abandoned chemicals;
93. Unused or unwanted chemicals;
94. Chemicals in deteriorating containers;
95. Empty containers that have visible residues;
96. Containers with conflicting labels;
97. Unlabeled or unknown chemicals;
98. Chemicals falling under the extremely hazardous waste list of chemicals as per Cal/EPA.
99. Proper Hazardous Waste Management
100. Training: Receive prior to working with hazardous materials;
101. Waste identification: Identify all waste streams and avoid mixing of incompatibles;
102. Labeling: Must be done upon start of accumulation;
103. Storage: Supervised and not accessible to public, disposed of within 6 months, always in secondary container and closed when not in use, if volume reaches 50 gallons of hazardous waste or 1 quart of extremely hazardous waste must be disposed of within 3 days, not to be poured down the drain, not to be evaporated;
104. Segregation: acids from bases, oxidizers from organic compounds, cyanides from acids, or by hazard class like flammables, oxidizers, pyrophoric, reactive, reducing agents, acids, bases, toxic chemicals;
105. Incompatible waste streams: All chemical constituents and their waste byproducts must be compatible within same waste container;
106. Wastes requiring special handling: Unknown chemicals, expired peroxide formers, dry picric acid, explosives and other compounds with shipping restrictions;
107. Managing empty containers: Empty containers are not hazardous waste unless they once held an extremely hazardous material or they are greater than 5 gallons;
108. Transportation: Illegal with a personal vehicle or across campus streets that are open to the public;
109. Disposal: Request a pickup with EH&S.
110. Hazardous Waste Minimization
111. Purchasing control: Avoid duplicates and order only what is needed for the experiment;
112. Inventory control: Redistribute unused/surplus chemicals to other users, rotate chemical stock to keep chemicals from becoming outdated;
113. Operational controls: review experiment for minimization of chemical use, employee small scale procedures, use instrumental methods in lieu of wet chemical techniques, use off-site analytical services if cost effective, avoid mixing hazardous and non-hazardous streams, use less hazardous or non-hazardous substitutes when feasible.
114. **ACCIDENTS, EMERGENCIES, AND CHEMICAL SPILLS**
115. Accidents
116. Post emergency telephone numbers and locations of treatment facilities;
117. Provide training of adequate number of staff in basic CPR and first aid;
118. Provide training of staff to accompany injured personnel to treatment site with SDS at hand;
119. Report all events to supervisor and EH&S at 4-6200;
120. Call for emergency response if incident is severe or life threatening;
121. If trained in First Aid, treat with a first aid kit and send to Newport Urgent care (949-752-6300) if incident is minor;
122. Contact supervisor and EH&S at 4-6200 within 8 hours when dealing with a serious occupational injury, illness, and exposure to hazardous substances.
123. Fire Related Emergencies
124. Pull fire alarm pull station and call 911;
125. Report all fires to EH&S x46200;
126. Evacuate and isolate the area;
127. Remain safely outside the affected area to provide details to emergency responders;
128. Evacuate building when alarm sounds;
129. If your clothing catches on fire use emergency shower immediately or if that is not feasible stop, drop, and roll.
130. Chemical Spills
131. They are an emergency when spills result in a release to the environment, when dealing with an unknown, and when the hazard cannot be managed by laboratory staff;
132. Try to remove or isolate chemical if safe to do so;
133. If skin or eye exposures occur, remove contaminated clothing immediately and flush affected area using an eyewash or safety shower for 15 minutes;
134. Affected employees must receive medical treatment and/or assessment;
135. Small chemical spills less than 1 liter of non-highly toxic chemical, can be cleaned up by laboratory personnel that are trained in chemical spill procedures;
136. Do not clean a spill (large or small) if you feel it is unsafe to do so, if you are not trained or unfamiliar with spill control procedures, or if you feel any physical symptoms of exposure (eye irritation, difficulty breathing, skin irritation);
137. Large chemical spills that include spills of large quantities (over 1 liter) of chemicals, any quantity of highly toxic chemicals, or chemicals in public areas or adjacent to a drain, require emergency response. Call 911.

\*This document is an overview of the campus CHP. This document serves as a reference guide and general training tool only and is not intended to replace the Chemical Hygiene Plan. All researchers are required to read and understand the CHP prior to working with hazardous chemicals. http://www.ehs.uci.edu/programs/lsg/UCI\_CHP.pdf