CHMS Safety Committee
April 22, 2013

Minutes

Present: de Ropp, Gage, Gates, Kim, Tseregounis (Chair)

Guests: Jeff Feerer (COE), Veronica Thron (EH&S)

I) Jeff F and Veronica reviewed the finalized UC policies (attached) on:
   a) Lab Safety Training
   b) Personal Protective Equipment (PPE)
   c) Minors in Labs

The Lab Safety Training will include three components:
   1) Basic lab safety, an on-line course
   2) Departmental safety training
   3) SOPs for each lab for both chemicals and procedures

II) Jeff F and Veronica review the new Hazard Assessment Tool (HAT), attached. The responses to the HAT will determine the degree/variety of PPE needed and simultaneously generate a voucher that will enable one to get free PPE from campus.

III) Chemical Inventory in CHMS: Status

We reviewed the status of CI in the department. While most labs have submitted their CI a few have not. We are following up with them.

IV) We have provided lab coats for both undergraduate teaching labs, Kemper 163 and Bainer 1318, and spot checks have indicated that they are being used.

V) The committee reviewed two Safety Award applications and unanimously voted to select the Moule group proposal (attached) as the winner.
Summary of Changes to Lab Safety Policies

In January 2013, notices for employee comments on the proposed policies were sent to represented and non-represented employees with closing period for comments of February 22. This comment period was extended to March 1, as some campuses requested additional time to request feedback. Overall 400 comments received regarding the policies, with over 90% of the comments regarding the Personal Protective Equipment (PPE) policy. General comments and changes regarding all three policies are noted below.

Personal Protective Equipment

On March 1, the Office of Risk Services hosted a meeting of Department Chairs with Laboratory Operations at UCOP to discuss laboratory safety and proposed revisions to the proposed policies. Due to the number of comments and verbal feedback from this meeting, OPRS convened a two day meeting at UC Davis on March 19-20 with interested Department Chairs and EH&S staff to revise the draft policy so that it would meet regulatory requirements, be supported by faculty, and most importantly, be effective.

Changes to the policy include the following:

1. The original policy required that a lab coat and eye protection be worn by all personnel upon entering a laboratory, but allowed exemptions with the approval of the campus EH&S Department. It was noted that due to the major differences in the type of research performed and design of laboratories, over 80% of campus labs would request an exemption from this requirement. While the policy still requires pants and closed toe/heel shoes to be worn when entering a laboratory, lab coats and eye protection are now required when actively involved in research. Additionally, the lab must determine the “splash” zone area in which other lab personnel will also be required to wear additional PPE. (This change addressed majority of comments regarding this policy).

2. The policy now includes specific exemptions from wearing PPE
   a. Researchers would be permitted to remove protective eye wear when using a microscope.
   b. PPE free corridors through the lab are delineated.
   c. Non Hazardous work areas (offices and work stations) are delineated by distance or a physical barrier

3. The policy clarifies that students in a teaching lab are only required to wear PPE when directed by the instructor. The prior language was not clear and seemed to indicate that students had to wear PPE even when taking a written test in a teaching lab.

4. Appendix B was added with a sample Laboratory Hazard Assessment Tool (LHAT) for campuses to use to help evaluate PPE requirements.
Laboratory Safety Training Policy

The Laboratory Safety Training policy received approximately twenty comments that were generally supportive of the policy, but requested clarification on who is required to complete the various trainings and whether the “orientation checklist” is mandatory. Changes to the policy were made to address these issues and were not substantive changes in terms of meaning or intent.

Minors in Laboratories and Shops Policy

Approximately thirty comments were received on Minors in Laboratories and Shops policy. Many comments expressed support for the policy and some comments indicated that they felt the policy should not allow exceptions to allow any minors in laboratories or shops. The majority of comments; however, expressed concern on how the policy would affect single parents and that the policy would disproportionately affect women. Additional concerns were raised that the policy may limit participation of high school students in tours and other educational outreach activities. The majority of comments had come from UC Berkeley, where many of the researches providing comments were not aware that the campus had an existing policy that was stricter than the policy being proposed.

Changes were made to the policy to clarify that minor children were allowed to be in enclosed offices and break rooms as well as laboratories that are free from hazardous chemicals. Although the policy already exempted organized tours from the waiver and training requirements, additional language was inserted to exempt campus or department sponsored events.
University of California Policy

Laboratory Safety Training

<table>
<thead>
<tr>
<th><strong>Responsible Officer:</strong></th>
<th>Chief Risk Officer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responsible Office:</strong></td>
<td>RK - Risk / EH&amp;S</td>
</tr>
<tr>
<td><strong>Issuance Date:</strong></td>
<td>[Issuance Date]</td>
</tr>
<tr>
<td><strong>Effective Date:</strong></td>
<td>[Effective Date]</td>
</tr>
</tbody>
</table>

**Scope:**
This policy establishes minimum requirements for all University workers which individual campuses, departments/units, and work groups may exceed as they deem necessary. It applies to workers regardless of their title; e.g., student, graduate student, postdoctoral scholar, faculty or other academic appointee, staff, visitor, volunteer, etc.

**Contact:**
Erike Young
**Email:** Erike.Young@ucop.edu
**Phone #:** (510) 987-0170

---

I. **POLICY SUMMARY**

The University of California is committed to providing a safe and healthy working environment for all members of the campus community. This laboratory safety training policy is designed to prevent workplace injuries and illnesses for all faculty, staff, students, volunteers, and visitors. A primary means to achieve this goal is through safety training. Safety training is particularly important for those who work with hazardous materials, equipment, and processes in research and teaching. Safety training is done within departments, work groups, shops, laboratories, and/or centrally by Environment(al) Health and Safety (EH&S).

This policy identifies minimum training requirements applicable to all workers. A laboratory safety training needs assessment and fundamentals of laboratory safety training shall be completed. Based on the needs assessment, additional safety training may be needed for specific hazardous work activities.
II. DEFINITIONS

**Documented Training:** Training records shall include at minimum:

- the name of the individual trained;
- name of the individual(s) providing the training for instructor-led training;
- date of the training;
- and brief description of the training topics covered.

**Laboratory/Technical Areas:** A laboratory/technical area is any location where the use or storage of hazardous materials or equipment may present a potential hazard are used or stored. It includes, but is not limited to:

<table>
<thead>
<tr>
<th>Research laboratories</th>
<th>Waste accumulation areas/locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching laboratories</td>
<td>Cold rooms</td>
</tr>
<tr>
<td>QA/QC and analytical laboratories</td>
<td>Machine and other Workshops</td>
</tr>
<tr>
<td>Stock rooms</td>
<td>Vivaria</td>
</tr>
<tr>
<td>Storage rooms</td>
<td></td>
</tr>
</tbody>
</table>

**Student:** An individual enrolled in an academic class.

**Supervisor:** An employee who may have authority to hire personnel, evaluate performance, direct work assignments, apply progressive discipline, direct resources to correct identified safety issues. This includes a Principal Investigator, area manager, unit manager, project manager, superintendent, and foreman/person. Unless specified in writing, the default “supervisor” in laboratory/technical areas is the Principal Investigator.

**Training Needs Assessment:** Assessment of the training requirements of a target group in terms of (1) risk of hazards present in work activities, (2) their educational and professional background, (3) regulatory requirements for training. The training needs assessment must be documented.

**Worker:** For purposes of this policy, a worker is an individual who actively performs work functions with hazardous materials or equipment in a laboratory/technical area. A “worker” may be faculty, staff, student volunteer assisting in a non-academic class, or visitor/visiting scholar. For the purpose of this definition, “worker” excludes individuals who only passively participate in tours, lectures, conferences, etc. and enrolled undergraduate students in a teaching laboratory.

**Training needs assessment:** An assessment of specific laboratory safety training needs will occur and be documented for all workers before the worker undertakes their work duties. The supervisor shall be responsible for accomplishing the needs assessment. See Appendix C for list of potential training areas relative to current regulations.

The extent of Safety Training will depend on the type of work. See “Procedures” Section V for details.
III. COMPLIANCE / RESPONSIBILITIES

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

Vice Chancellors/Directors/Deans/Departments Chairs are responsible for communicating, promoting, and enforcing the Policy in areas under their control.

The campus or unit Laboratory and/or Chemical Safety Committee is responsible for promoting a safe working environment in all research and teaching laboratories on campus.

Supervisors are responsible for complying with this Policy and ensuring their staff comply with this Policy. Supervisors are responsible for conducting and documenting the laboratory safety training needs assessment or reviewing and approving the assessment if conducted by others. They are also responsible for ensuring their staff receive the required training. Noncompliance with the policy is handled in accordance with Personnel Policies for Staff Members (PPSM) policies 62-65 pertaining to disciplinary actions and Academic Personnel Manual (APM) policies 015-016 pertaining to the Faculty Code of Conduct and administration of discipline; and APM 140 and 150 pertaining to Non-Senate Academic Appointees.

Workers are responsible for knowing the training requirements for areas in which they work or enter. All workers are responsible for completing required training. They are responsible for informing others in the area of these requirements and reporting unsafe conditions to the supervisor, or EH&S. As applicable, a staff employee may address issues of noncompliance with the policy through the complaint resolution processes described in PPSM 70 and II-70 (Complaint Resolution) and PPSM 71 and II-70 (Resolution of Concerns) or Collective Bargaining Agreement.

The Office of Environment(al), Health & Safety (EH&S) is responsible for providing interpretation and clarification regarding this Policy. EH&S will also provide consultation and tools to assist supervisors in performing the laboratory safety training needs assessment and with developing training.

The Academic Personnel or Staff Human Resources Offices are responsible for all employee and labor relations issues, including interpretation and clarification of Personnel Policies and Collective Bargaining Agreements related to this Policy.

IV. PROCEDURES

A. Fundamentals of Laboratory Safety Training

Before any worker is granted unescorted access to laboratory/technical areas, they shall successfully complete a “Fundamentals of Laboratory Safety” training as offered/managed by their local EH&S department. Campuses may offer this training via instructor-led, web-based, or both. Minimum training topics are noted in Appendix A. Where offered and applicable, web-based training can be completed in the interim period before the next live training is offered. (If no web-based training option is available, in the interim period before the next live
training is offered, the worker may begin work so long as the PI/laboratory supervisor provides and documents one-on-one safety training and closely supervises the new worker.) **Target audience:** workers whose primary work location is in laboratory/technical areas.

The completion of the “Fundamentals of Laboratory Safety” training requirement does not apply to undergraduate students taking laboratory courses offered in the course catalog of that campus, unless the student is considered to be a “worker” as defined above; however, the teaching laboratory instructor, teaching assistant, and/or classroom laboratory manager is still responsible for conveying the necessary information for students to work safely.

Refresher training for Fundamentals of Laboratory Safety will be provided at a minimum of every three (3) years. More frequent refresher training requirements will be at the discretion of individual campuses.

**B. Safety Training - General Requirements**

All required safety training shall be completed and documented for each affected worker. All reasonable efforts shall be made to complete required training before the individual begins work with the material, process or equipment in question.

Given the wide diversity of UC activities, any required training may occur at the individual workplace level, centrally through EH&S, or both. Each campus shall determine how the various requirements will be addressed, but in general if needed training is not available centrally through EH&S, the worker’s supervisor is responsible to ensure that appropriate training has been completed. General responsibilities of personnel are addressed in Section III.

**C. Laboratory Site Safety Orientation**

Laboratory workers are required to receive a safety orientation specific to their unique laboratory work location and the processes common to their laboratory worksite. A “Laboratory Site Safety Orientation” shall be performed by the supervisor on the first day the worker is granted access to or assigned work activities in the laboratory. A sample *Laboratory Site Safety Orientation* checklist can be found in Appendix B. This training orientation will be documented.

**D. Hazard-Specific Safety Training**

Based on the laboratory safety training needs assessment, workers shall attend training on the specific additional hazards that may be present in the work place. This training may be provided by EH&S, supervisor, or other qualified person. This hazard-specific training might include lock out/tag out, vivarium operations, general radiation or biological safety training. Refer to Appendix C for more information.

**E. Site-Specific Operating Procedure Safety Training**

This training is most appropriately provided by the supervisor or departmental staff and is focused on the specific procedures and activities unique to the worker’s primary work place. These operating procedures might include work with particularly hazardous substances, pyrophoric chemicals, radioisotopes,
biological agents, lasers, machine tools, autoclaves, etc. This type of training is intended to address specific topics not covered by the trainings described above.

F. Training Documentation

Documentation shall include at minimum: the full name of the individual trained; full name of the individual(s) providing the training for instructor-led training; date of the training; and a brief description of the training topics covered.

Training records shall be maintained for a minimum of one year after the worker leaves the University or as required by the terms of a grant, whichever period is longer. In the event of an accident, records shall be retained 3 years from the date of the accident or one year after the worker leaves the University or as required by the terms of a grant, whichever period is longer.

V. RELATED INFORMATION

Appendix A Laboratory Safety Fundamentals Training Topics
Appendix B Laboratory Site Safety Orientation
Appendix C Federal and State Safety Training Mandates
California Code of Regulations, Title 8, General Industry Safety Orders:
Section 3203 – Injury and Illness Prevention Program;
Section 5191 – Occupational Exposure to Hazardous Chemicals in Laboratories;
Section 5194 – Hazard Communication
Section 3380 – Personal Protective Devices;
Section 5154.1 – Ventilation Requirements for Laboratory-Type Hood Operations;
Section 3221 – Fire Prevention Plan
California Health & Safety Code, Ch. 6.95, 25504
Resource Conservation and Recovery Act, Title 40, Federal Code of Regulations
University Policy on Management of Health, Safety and the Environment (October 2005)

VI. FREQUENTLY ASKED QUESTIONS

Not applicable

VII. REVISION HISTORY

This is the first version of this policy.
Appendix A
Laboratory Safety Fundamentals Training Topics

Per this policy, laboratory workers subject to the Cal/OSHA standard entitled: Occupational Exposure to Hazardous Chemicals in Laboratories: (Title 8, California Code of Regulations, Section 5191) shall complete a Laboratory Safety Fundamentals Training. This training generally includes, but is not limited to, the following topics:

- A Culture of Safety
- Chemical Hygiene Plan
- Analyze Hazards--Laboratory Physical Hazards
- Analyze Hazards--Chemical Hazards
- Analyze Hazards--Biological Hazards
- Analyze Hazards--Radiological Hazards
- Develop Controls--Administrative
- Develop Controls--Engineering
- Develop Controls--Personal Protective Equipment (PPE)
- Perform Work—Prudent Practices
- Perform Work—Recognition of Exposure
- Perform Work—Emergencies
- Rights and Responsibilities

Based on local campus conditions, additional campus training topics may be added as appropriate.
### Appendix B (Non-Mandatory)
Laboratory Site Safety Orientation

Before completing this form all laboratory personnel need to have successfully complete the UC *Laboratory Safety Fundamentals* course.

<table>
<thead>
<tr>
<th>Initial</th>
<th>Training Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Emergency Procedures</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Fire alarm pull station:</strong> Location of and demonstrate how to activate.</td>
</tr>
<tr>
<td></td>
<td><strong>Eye wash/safety showers:</strong> Location of and demonstrate how to activate.</td>
</tr>
<tr>
<td></td>
<td><strong>First aid kits:</strong> Locations of and contents.</td>
</tr>
<tr>
<td></td>
<td><strong>Phone:</strong> Locations of, phone dialing instructions and posting of ‘911’ dialing instructions.</td>
</tr>
<tr>
<td></td>
<td><strong>Emergency Procedures Guide:</strong> Locations of flipchart, and discuss actions for each of the scenarios listed.</td>
</tr>
<tr>
<td></td>
<td><strong>Shelter-in-Place:</strong> Review procedures for securing the lab for shelter-in-place orders.</td>
</tr>
<tr>
<td></td>
<td><strong>Primary and Secondary Routes of Egress:</strong> Walk both pathways to Emergency Assembly Area. Review evacuation procedures for disabled employees.</td>
</tr>
<tr>
<td></td>
<td><strong>Emergency Assembly Area:</strong> Review Lab gathering point and evacuation procedures.</td>
</tr>
<tr>
<td></td>
<td><strong>Reverse 911:</strong> Enroll in campus emergency alert system.</td>
</tr>
</tbody>
</table>

### Engineering Controls

|         | **Chemical fume hoods:** Demonstration of proper use and instruction on adjustable controls. |
|         | **Biological safety cabinets:** Demonstration of proper use and instruction on adjustable controls. |
|         | **Chemical storage locations:** Locations and segregation rules. |
|         | **Other engineering controls (glove boxes, gas cabinets):** Demonstration of proper use and instruction on adjustable controls Describe: |

### Administrative Controls

|         | **Laboratory Safety Manual (including Chemical Hygiene Plan):** Location of and content description. |
|         | **SDS:** Demonstrate electronic access to Safety Data Sheet repository. |
|         | **Laboratory Standard Operating Procedures (SOPs):** Location of written SOPs, describe the required approvals needed. |
|         | Identification of Chemical Processes / Areas that require specific SOP use. |
|         | Determine additional Hazard-Specific Safety Training courses needed. Enroll in courses. |

### Personal Protective Equipment

|         | **Lab Coat:** Provide at no cost a fitted lab coat. Certain labs require flame resistant lab coats |
|         | Type: ☐FR ☐Normal Size: ______________________ |
|         | **Eye protection:** |
Provide at no cost a fitted pair(s) of safety glasses. Safety glasses must be of the type and adjusted accordingly to be worn comfortably and stay securing in place. For laboratory where goggles must be worn provide pair(s) of fitted chemical splash goggles.

Corrective Prescription Y/N    Model: ________________________

______  Gloves:
Location of, knowledge to select the correct type and instructions on how to properly don and doff.

______  Other:

Waste Disposal

______  Hazardous Waste Accumulation Area: Demonstrate Location, proper labeling, proper storage requirements, and process to request pick-up.

Other

______  Understands safety procedures for specific operations (e.g., UV light, laser, safe use of specialized equipment, high voltage equipment, confined space, etc.). Describe:
Appendix C
Federal and State Safety Training Mandates

Safety training clearly fosters a safer work environment and reduces the likelihood of injuries, property damage, hazardous materials releases, etc. However, documented safety training is also a regulatory requirement within numerous state and federal regulatory frameworks, such as OSHA, Health & Safety Code, Fire Code, etc. These training requirements intersect a host of specific research-related activities.

Below is a list of the major research safety training issues mandated by various regulatory agencies. The list is not comprehensive, but attempts to convey the breadth of the major requirements.

<table>
<thead>
<tr>
<th>Cal-OSHA, Title 8</th>
<th>Section</th>
<th>Typical Job Classification</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Industry Safety Orders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Injury &amp; Illness Prevention Program</td>
<td>3203</td>
<td>All employees</td>
<td>Initial w/ updates</td>
</tr>
<tr>
<td>Fume hoods</td>
<td>5154.1</td>
<td>Users</td>
<td>Initial</td>
</tr>
<tr>
<td>Chemical Hygiene Plan</td>
<td>5191</td>
<td>Chemical users</td>
<td>Initial w/ updates</td>
</tr>
<tr>
<td>Regulated Carcinogens</td>
<td>5200-5220</td>
<td>Exposed employees</td>
<td>Initial</td>
</tr>
<tr>
<td>Personal Protective Equipment</td>
<td>3380</td>
<td>PPE users</td>
<td>Initial</td>
</tr>
<tr>
<td>Bloodborne Pathogens</td>
<td>5193</td>
<td>Potentially exposed employees</td>
<td>Initial, annual</td>
</tr>
<tr>
<td>Aerosol Transmittable Diseases</td>
<td>5199</td>
<td>Potentially exposed employees</td>
<td>Initial, annual</td>
</tr>
<tr>
<td>Emergency Action Plan</td>
<td>3220</td>
<td>Impacted employees</td>
<td>Initial w/ updates</td>
</tr>
<tr>
<td>Fire Extinguishers</td>
<td>6151</td>
<td>Assigned employees</td>
<td>Initial, annual</td>
</tr>
<tr>
<td>Material Safety Data Sheets</td>
<td>5194</td>
<td>Chemical users</td>
<td>Initial</td>
</tr>
<tr>
<td>Haz. Waste Ops. &amp; Emerg. Response</td>
<td>5192</td>
<td>Assigned employees</td>
<td>Initial, annual</td>
</tr>
<tr>
<td>Heat stress (field operations)</td>
<td>3395</td>
<td>Exposed employees</td>
<td>Initial</td>
</tr>
<tr>
<td>Laser equipment</td>
<td>1801</td>
<td>Operators</td>
<td>Initial</td>
</tr>
<tr>
<td>Control of Haz. Energy (lockout/blockout)</td>
<td>3314</td>
<td>Affected employees</td>
<td>Initial</td>
</tr>
<tr>
<td>Respiratory Protection</td>
<td>5144</td>
<td>Users</td>
<td>Initial, annual</td>
</tr>
<tr>
<td>Permissible Exposure Limits</td>
<td>5155</td>
<td>Chemical users</td>
<td>Initial</td>
</tr>
<tr>
<td>Confined Spaces</td>
<td>5157</td>
<td>Affected employees</td>
<td>Initial</td>
</tr>
</tbody>
</table>

Beyond meeting training mandates on specific issues, Cal-OSHA also has broad language/authority under their Injury & Illness Prevention Program regulation regarding training:

*Every employer shall establish, implement and maintain an effective Injury and Illness Prevention Program. The Program shall... provide training and instruction:*

(A) When the program is first established;

(B) To all new employees;

(C) To all employees given new job assignments for which training has not previously been received;

(D) Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard;

(E) Whenever the employer is made aware of a new or previously unrecognized hazard; and,
University of California Policy
Laboratory Safety Training

(F) For supervisors to familiarize themselves with the safety and health hazards to which employees under their immediate direction and control may be exposed.

For more information see the Cal-OSHA website: [http://www.dir.ca.gov/dosh/dosh_publications/TrainingReq.htm](http://www.dir.ca.gov/dosh/dosh_publications/TrainingReq.htm)

Or see the UC Systemwide Training and Education Workgroup training matrix (includes non-lab training mandates): [http://stew.ucdavis.edu/Matrix/](http://stew.ucdavis.edu/Matrix/)

Other Research-related Areas that Mandate Training (not comprehensive)

- Infectious biological materials (Biosafety in Microbiological and Biomedical Laboratories - NIH/CDC Guidelines)
  
  Training on safe work practices to obtain/maintain PI-authorization from local Institutional Biosafety Committee

- Ionizing radiation or radiation producing equipment (California Code of Regulations, Title 17, Div. 1, Ch. 5)
  
  Training on safe work practices to obtain/maintain PI-authorization from local Radiation Safety Committee

- Research animals (Association for Assessment and Accreditation of Laboratory Animal Care - AAALAC)
  
  Training on proper and ethical animal handling to maintain institutional accreditation and PI-authorization from local animal care committee

- Chemical waste generators (CA Health and Safety Code 25200.3.1(b)(1))
  
  Waste accumulation area is managed by personnel who have received training commensurate with their responsibilities and authority for managing hazardous wastes

- Hazardous materials users (California Health & Safety Code, Section 25504c. - Business Plan)
  
  Initial and annual training on emergency response procedures for workers potentially affected by hazardous materials

  
  Affected workers shall be familiar with chemical nature of materials and mitigating actions in event of fire, leak, spill

- Receive/package/ship hazardous materials (Code of Federal Regulations, 49, Part 172, Subpart H)
  
  Training on regulations and procedures
I. POLICY SUMMARY
The University of California is committed to providing a healthy and safe working environment for all members of the campus community. This Personal Protective Equipment (PPE) policy is designed to prevent workplace injuries and illnesses for all academic appointees, staff, students, and visitors.

II. DEFINITIONS
Hazardous Materials: Hazardous materials, for the purposes of this policy, are chemical or biological agents that have been generally accepted as a health or physical hazard. Unsealed radioactive materials are also included as “hazardous materials.” Additional guidance is included in Appendix A.
Laboratory/Technical Areas: For the purposes of this policy, a laboratory/technical area is a location where the use or storage of hazardous materials occurs or where equipment may present a physical or chemical hazard. It includes, but is not limited to:

- Research laboratories
- Teaching laboratories
- QA/QC and analytical laboratories
- Stock rooms
- Storage rooms
- Waste accumulation areas/locations
- Cold rooms
- Machine and other Workshops
- Vivaria
- Visual/performing arts studios and shops

Personal Protective Equipment (PPE): Personal protective equipment is worn to minimize exposure to a variety of hazards. Examples of PPE include such items as lab coats, gloves, foot protection (steel-toed shoes), eye protection (safety glasses or goggles), protective hearing devices (earplugs, muffs), hard hats, respirators, fall protection harnesses, etc.

Physical Hazards: Physical hazards are identified as substances, equipment, or activities that can threaten physical safety. Physical hazards can include but are not limited to: impact (falling objects), fall hazards, extreme pressures, temperature extremes (heat/cold), radiation (ionizing and non-ionizing), noise, vibration, electrical, light (optical), welding, cutting, brazing).

Student: An individual enrolled in an academic class.

Supervisor: An employee who may have authority to hire personnel, evaluate performance, direct work assignments, apply progressive discipline, direct resources to correct identified safety issues. This includes a Principal Investigator, area manager, unit manager, project manager, superintendent, and foreman/person. Unless specified in writing, the default “supervisor” in laboratory/technical areas is the Principal Investigator.

Use or Storage: For the purposes of this Policy, “use or storage” includes those operations where workers are directly manipulating hazardous materials, adjacent to or in proximity to a hazard or in areas where there is a reasonable risk of exposure. Reasonable risk of exposure includes all activities identified in the hazard assessment that pose an exposure risk to the worker.

Worker: For purposes of this policy, a worker is an individual who actively performs work functions with hazardous materials or equipment in a laboratory/technical area. A “worker” may be faculty, staff, student volunteer assisting in a non-academic class, or visitor/visiting scholar. For the purpose of this definition, “worker” excludes individuals who only passively participate in tours, lectures, conferences, etc.

III. POLICY TEXT

Hazards exist in every University workplace and can take many different forms: sharp edges, falling objects, flying sparks, chemicals, noise, and a myriad of other potentially
dangerous situations. This policy requires that the University protect its workers from workplace hazards that can cause injury.

Controlling a hazard at its source is the best way to protect employees. Depending on the hazard or workplace conditions, the preferred solution is the use of engineering or work practice (administrative) controls to manage or eliminate hazards to the greatest extent possible. When engineering or administrative (work practice) controls are not feasible or do not provide sufficient protection, supervisors must provide personal protective equipment (PPE) to their workers and ensure its use.

Failure/refusal to wear required PPE is a basis for discipline, in accordance with locally-established procedures. A student not wearing course required PPE in a laboratory/technical area may not participate in lab activities until such PPE is worn.

This policy sets minimum systemwide requirements; each campus may develop policies and procedures which meet or exceed this policy standard.

A. General Program Requirements

1. For workers:
   a. Perform Hazard Assessment
      Each supervisor shall assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). This assessment must evaluate both the hazards to the individuals performing the work and assess the hazards to individuals who occupy the room or space where the work is being performed.

      Each supervisor shall verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated; the person certifying that the evaluation has been performed; the date(s) of the hazard assessment and identifies the document as being a certification of hazard assessment. Hazard assessments that indicate less than the minimum PPE for a laboratory/technical area as stated in section B require review and approval from campus Environment(al) Health and Safety (EH&S) in accordance with local procedures (See section B3).

      A completed standard operating procedure, job hazard analysis, or other similar document which includes a workplace hazard assessment can be used to satisfy this requirement.

   b. Identify Required PPE
      Each supervisor, based upon the hazard assessment, shall ensure that the appropriate personal protective equipment has been identified and is provided for each user. The PPE must be the proper fit and design for the user and not interfere with the ability of
the worker to work safely. The PPE will be provided to the worker at no cost.

c. **Training**

Each supervisor will assure workers know how to properly wear, adjust and maintain assigned PPE. Workers will demonstrate understanding of the proper use of assigned PPE. The training must cover these elements: When PPE is necessary; What PPE is necessary; How to properly don, doff, adjust, and wear PPE; The limitations of the PPE, and; The proper care, maintenance, useful life and disposal of the PPE. Training will be documented.

d. **Maintenance and Replacement**

Each worker is responsible for properly wearing required PPE. Each worker is responsible for informing their supervisor when worn or damaged PPE needs to be replaced.

e. **Evaluating the Appropriateness of Identified PPE**

Each supervisor is responsible for periodically re-evaluating the selection and use of PPE in work areas under their control. The hazard assessment should be repeated when new hazards are identified or introduced into the workplace or at least every three (3) years.

2. **For students:**

Academic courses which include laboratory, shop or field work are required to indicate PPE requirements (including specifications of the type of PPE) as part of the course syllabus. These PPE items shall be the responsibility of the student to obtain and wear as part of the class. Common communal PPE such as thermal protective, welding aprons, face shields, etc., will be provided by the sponsoring department. The instructor of record for a course, or designee, is responsible for ensuring that students are familiar with and properly using required protective devices.

**B. Minimum Attire and Personal Protective Equipment Requirements for Laboratories/Technical Areas**

The following minimum attire and PPE requirements pertain to all laboratories/technical areas where use or storage of hazardous materials occurs or a physical hazard exists. This section should be used as the basis for developing the required PPE elements to include in the course syllabus for laboratory classes. The wearing of required PPE may only be modified as determined by a standard operating procedure or the laboratory hazard assessment. (See section III.A.1.a).
1. Attire when occupying a Laboratory/Technical Area
   a. Full length pants (or equivalent) and closed toe/heel shoe attire must be worn at all times by all workers who are occupying or entering a laboratory/technical area. The area of skin between the pants and shoe should not be exposed.

2. PPE when working with, or adjacent to, hazardous material use areas within a Laboratory/Technical Area
   a) Laboratory coats (or equivalent protective garments) and protective eyewear are required to be worn by all workers working with hazardous materials. In addition, laboratory personnel occupying the adjacent area, who have the potential to be exposed to chemical splashes or other hazards as determined by SOP requirements and/or the laboratory hazard assessment, are required to wear laboratory coats (or equivalent protective garments) and protective eyewear.
      i. Laboratory coats must be appropriately sized (and if necessary fitted) for the worker. Coats must be buttoned/snapped to their full length. Laboratory coat sleeves must be of a sufficient length to prevent direct skin exposure while wearing gloves.
      ii. Flame Resistant (FR-rated) laboratory coats must be worn when working with any amount of pyrophoric materials. FR-rated lab coats are also required when working with flammable liquids in laboratories using open flames or other potential ignition sources; or as determined by the hazard assessment.
      iii. Laboratory coats shall not be laundered at private residences or public laundry facilities. Any protective clothing that becomes contaminated with hazardous materials must be decontaminated prior to being laundered or appropriately discarded. Campuses are responsible for providing suitable laundry services to maintain required laboratory coats.
      iv. All protective eyewear must meet American National Standards Institute (ANSI) standards and be appropriate for the work being done. Typical prescription spectacles are not suitable eye protection. Prescription safety glasses/goggles are available through individual campus procurement offices. Protective eyewear may be removed when using optical microscopes or similar instruments, requiring close contact between the eyes and the eyepieces.

b) Protective gloves must be worn while using any hazardous materials, hot or cold liquids (including cryogenics), objects that pose a risk of thermal burns, items having physical hazards, or equipment that may cause hand injury. These gloves must be
appropriate for the material or process being used and must not interfere with the ability of the worker to work safely. The Safety Data Sheet (SDS) for the material and the manufacturer-specific glove selection guide should be referenced to determine appropriate glove type.

c) Some operations and procedures may warrant additional PPE, as indicated by the Safety Data Sheet (SDS), the Standard Operating Procedures (SOP), facility policies, regulatory requirements, or the hazard assessment. These might include face shields, aprons, respiratory protection, hearing protection, etc.

3. Exceptions

a) The minimum personal protective equipment requirements for Laboratories/Technical Areas (sections III.B.1-2) will not apply to:

i. Laboratories/technical areas which have been designated and posted as free of physical or chemical hazards. Examples: Laboratories/technical areas that house only operations with no inherent physical or chemical hazards during normal, reasonably foreseeable upset (unexpected occurrence), or routine maintenance activities. Examples include some electron microscope rooms, precision measurement rooms, etc.

b) Exceptions that require written approval from their campus Environment(al) Health and Safety (EH&S) Department or EH&S approved department designees. EH&S has the final authority for determining this risk assessment.

i. The establishment of a level of personal protective equipment below the minimum specified in sections III.B.1-2 to a laboratory/technical area that uses hazardous materials or includes a physical hazard.

ii. The establishment of non-PPE required corridors that may be delineated within technical areas provided that the corridor does not pass near any potential exposure hazard.

iii. Non-hazardous work areas (e.g., offices, work stations) that are within laboratory/technical areas but are clearly delineated by distance or physical barrier (e.g., walls, doors, or cubicle dividers). It must be clear that the area is intended to be a self-contained, dedicated area. Readily movable furniture does not constitute a physical barrier as envisioned here.

1. Exceptions for individual desks or work spaces within a Technical Area are discouraged.
c) This policy does not apply to College of American Pathologists (CAP) accredited laboratories, which meet equivalent safety standards through CAP accreditation requirements.

IV. COMPLIANCE / RESPONSIBILITIES

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

Vice Chancellors/Directors/Deans/Departments Chairs are responsible for communicating, promoting and enforcing the Policy in areas under their control.

The Campus or School Laboratory and/or Chemical Safety Committee is responsible for promoting a safe working environment in all research and teaching laboratories on campus.

Supervisors are responsible for complying with this policy and ensuring their staff complies with this policy. Supervisors are also responsible for ensuring their staff receives both the required PPE identified in the hazard assessment, and documents their training on the proper use of their PPE. Noncompliance with the policy is handled in accordance with Personnel Policies for Staff Members (PPSM) policies 62-65 pertaining to disciplinary actions and Academic Personnel Manual (APM) policies 015-016 pertaining to the Faculty Code of Conduct and administration of discipline; and APM 140 and 150 pertaining to Non-Senate Academic Appointees.

Workers are responsible for knowing the PPE requirements for areas in which they work or enter, and for properly wearing PPE as established in this policy and in the hazard assessment. All workers are responsible for completing training, for knowing how to use PPE, for knowing how to properly put on and take off required PPE, and for knowing how to care for and maintain PPE. They are responsible for informing others in the area of these requirements and reporting unsafe conditions to their supervisor, or EH&S. Workers are NOT responsible for purchasing their own PPE. As applicable, a staff employee may address issues of noncompliance with this Policy through the complaint resolution processes described in PPSM 70 and II-70 (Complaint Resolution) and PPSM 71 and II-70 (Resolution of Concerns) or Collective Bargaining Agreement.

Students are responsible for obtaining course required PPE as noted in the course syllabus and wearing as directed by the instructor.

The Office of Environment(al), Health & Safety (EH&S) is responsible for providing interpretation and clarification regarding this Policy. EH&S will also provide consultation and tools to assist supervisors in performing the hazard assessment and with developing training. In cases where work 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 Academic Personnel or Staff Human Resources Offices are responsible for all employee and labor relations issues, including interpretation and clarification of Personnel Policies and Collective Bargaining Agreements related to this Policy.
V. PROCEDURES
Not applicable

VI. RELATED INFORMATION

Appendix A – Hazardous Materials
Appendix B – Laboratory Hazard Assessment Tool (LHAT)
8 CCR 3380 Personal Protective Devices: (http://www.dir.ca.gov/title8/3380.html)
8 CCR 5191 Laboratory Standard: (http://www.dir.ca.gov/title8/5191.html)
8 CCR 5194 Hazard Communication: (http://www.dir.ca.gov/title8/5194.html)
8 CCR 3203 IIPP: (http://www.dir.ca.gov/title8/3203.html)
8 CCR 5209: Listed Carcinogens (http://www.dir.ca.gov/title8/5209.html)

VII. FREQUENTLY ASKED QUESTIONS
Not applicable.

VIII. REVISION HISTORY
This is the first version of this policy.
 Appendix A
Hazardous Materials

Hazardous materials may be described using the following characteristics or regulatory definitions. This list is to be used as a guideline and allows for some laboratory/technical areas to be classified as non-hazardous materials areas. It does not supersede Cal/OSHA regulations or accepted safe work practices for specific materials. The container label and the Safety Data Sheet for the material should be consulted to determine the hazard classification(s) of a particular substance.

a) Corrosives. Any chemical that causes visible destruction of, or irreversible alterations in, living tissue at the site of contact. Examples: hydrochloric acid, sulfuric acid, sodium hydroxides, potassium hydroxides.

b) Materials recognized as readily absorbed through the skin. Examples: phenol, THF, DMSO, benzene, carbon disulfide, toluene.

c) Skin or eye irritants are chemicals which are not corrosive, but which cause a reversible inflammatory effect on living tissue by chemical action at the site of contact. Examples: xylenes, formamide, many amines like triethanolamine, carbon tetrachloride, perchloroethylene, many inorganic salts like cobalt and nickel sulfate.

d) Flammable liquids having a flash point not more than 93°C. Examples: organic solvents, ethers, alcohols, toluene, pentane, acetone.

e) Violently air-reactive or water-reactive chemicals, including pyrophorics (substances that spontaneously ignite in air). Examples: sodium or potassium metal, diethyl zinc, lithium aluminum hydride, t-butyl lithium, aluminum alkyls, calcium carbide, phosphine.

f) Carcinogens or Mutagens. Examples: formaldehyde, dichloromethane, benzene, chloroform.

g) Reproductive Hazards. Examples: acrylamide, Cd, Pb, Hg, Cr(VI), carbon disulfide, toluene, chloroform, ethylene glycol ethers.

h) Toxic or Highly Toxic Chemical. A material likely to be fatal or toxic if inhaled, ingested or by skin contact.

i) Oxidizing Agents. A material not necessarily combustible, but may, generally by yielding oxygen, cause or contribute to the combustion of other material. Examples: nitric and perchloric acids, chromates, nitrates, nitrites, hydrogen peroxide, chlorates.

j) Any unsealed radioactive material.

k) Biological materials classified as Risk Group 2, or greater.

l) Centers for Disease Control Select Agent Toxins.
Appendix B - Laboratory Hazard Assessment Tool
(Non-Mandatory)

This Laboratory Hazard Assessment Tool facilitates the identification of hazards and appropriate Personal Protective Equipment (PPE) to ensure the safety of lab personnel during work activities. The LHAT must be updated as hazards and personnel change, and at least once every 12 months, irrespective of changes to hazards or personnel.

The process is as follows:

1. Lab Personnel – Identify all lab personnel associated with the PI. This includes researchers, post-docs, graduate students, lab helpers, undergraduates and volunteers. Begin the LHAT with this step
2. Attend PPE Distribution Event with receipt of LHAT completion and type(s) PPE needed for individual
3. Fit PPE @ Event
4. Issue PPE @ Event
5. Training and Documentation of Training @ Event

What is a Lab Group?

Most PIs create a separate Lab Group for each lab they oversee. However, Lab Groups are designed to be flexible to allow PIs to create them in a manner that is intuitive to them. Please note that an LHAT Survey must be completed for each Lab Group created.

This tool is based on a model developed and used at the UCLA campus.
Appendix B - Laboratory Hazard Assessment Tool  
(Non-Mandatory)

This form must be completed by the PI, Lab Manager, or their designee at least once each calendar year to conduct an activity hazard assessment specific to activities in their laboratories. The Activity Hazard Assessment identifies hazards to employees and specifies personal protective equipment (PPE) to protect employees during work activities. The person(s) conducting the assessment must verify that it is complete and that training has been conducted.

EH&S personnel are available to assist you with completing your Activity Hazard Assessment form or with reviewing it after you’ve completed it. EH&S may also be consulted for specific questions regarding PPE requirements. Contact your EH&S representative.

<table>
<thead>
<tr>
<th>Principal Investigator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department:</td>
</tr>
<tr>
<td>PI Phone:</td>
</tr>
<tr>
<td>PI e-mail:</td>
</tr>
<tr>
<td>Laboratory Safety Contact:</td>
</tr>
<tr>
<td>Laboratory Safety Phone:</td>
</tr>
<tr>
<td>Laboratory Safety e-mail:</td>
</tr>
<tr>
<td>Name of Person(s) conducting Assessment</td>
</tr>
<tr>
<td>Assessor e-mail :</td>
</tr>
<tr>
<td>Assessor Phone Number</td>
</tr>
<tr>
<td>Date Assessment Completed</td>
</tr>
<tr>
<td>Lab Locations: Building(s) / Room(s):</td>
</tr>
</tbody>
</table>
Appendix B - Laboratory Hazard Assessment Tool
(Non-Mandatory)

Provide a listing of all of your Laboratory Personnel using the format below.

<table>
<thead>
<tr>
<th>First Name</th>
<th>Last Name</th>
<th>E-mail</th>
<th>Role (Principal Investigator (PI), Lab Manager (LM), Lab Worker (LW))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Personnel:</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>
<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>

Role: LW = Lab Worker, PI = Principal Investigator
Activity Hazard Assessment

In this section, you will:

- Conduct a hazard assessment of this lab group to identify activities when PPE is needed to protect the lab personnel;
- Certify the hazard assessment for the laboratory.

**Note:** In all cases chemical splash goggles can be substituted for safety glasses. For splash or impact protection, either safety goggles or safety glasses respectively need to be worn under face shields.

The final assessment report will identify PPE applicable to each hazard identified in the lab. **For activities that are described in a laboratory specific SOP or for activities where a Use Authorization(s) (UA) has been issued by a campus safety committee, the PPE specified in that SOP/UA shall take precedence.**
## Appendix B - Laboratory Hazard Assessment Tool
(Non-Mandatory)

### Activity performed
- **☐** Laboratory has been approved and posted as free of physical or chemical hazards Skip all other sections.

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>All Laboratories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher Attire (direct manipulation)</th>
<th>Adjacent Individuals Attire</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ ☐ E01. Entering laboratory</td>
<td>Many</td>
<td>✓ Long pants or equivalent ✓ Closed-toed/heel shoes ✓ Long hair tied back Note: Tights &amp; panty hose are considered undergarments</td>
<td>All personnel in laboratory room: ✓ Long Pants ✓ Closed toe/heel shoes</td>
</tr>
</tbody>
</table>

Under UC Policy full length pants (or equivalent), and closed toe/heel shoe attire must be worn at all times by all individuals who are occupying or entering a laboratory/technical area.
### Chemical Hazards

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ ☐ ☐</td>
<td>C01. Working with small volumes of corrosive (e.g. acids, caustics, etc.) liquids or solids.</td>
<td>Eye or skin damage. Low probability for a splash hazard.</td>
<td>✓ Safety glasses                          ✓ Chemical-resistant gloves ✓ Lab coat</td>
<td>In adjacent area within ___ meters: ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>☐ ☐ ☐</td>
<td>C02. Working with corrosive or acutely toxic liquids or other materials which creates a splash hazard.</td>
<td>Poisoning, increased potential for eye and skin damage.</td>
<td>✓ Safety goggles                             ✓ Chemical-resistant gloves ✓ Lab coat and ✓ Chemical-resistant apron</td>
<td>In adjacent area within ___ meters: ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>☐ ☐ ☐</td>
<td>C03. Working with small volumes of flammable solvents/materials when no reasonable ignition sources are present.</td>
<td>Skin or eye damage, potential poisoning through skin contact.</td>
<td>✓ Safety glasses                          ✓ Chemical-resistant gloves ✓ Lab coat</td>
<td>In adjacent area within ___ meters: ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>☐ ☐ ☐</td>
<td>C04. Working with flammable materials (including solvents): When using a large quantity; or, any quantity when there is a risk of ignition; or, areas where flammable vapors or gas are may be present.</td>
<td>Major Fire. Major skin or eye damage, potential poisoning through skin contact.</td>
<td>✓ Safety glasses                             ✓ Flame-Resistant (FR) outer gloves ✓ Chemical-resistant inner gloves ✓ NFPA 2112 rated Flame-Resistant (FR) lab coat</td>
<td>All personnel in laboratory room: ✓ Safety glasses ✓ NFPA 2112 rated Flame-Resistant (FR) lab coat</td>
</tr>
<tr>
<td>☐ ☐ ☐</td>
<td>C05. Working with toxic or hazardous chemicals (solid, liquid, or gas). (including but not limited to GHS H301, H302, H311, H312, H313, H332)</td>
<td>Skin or eye damage, potential poisoning through skin contact.</td>
<td>✓ Safety glasses                          ✓ Chemical-resistant gloves ✓ Lab coat</td>
<td>In adjacent area within ___ meters. ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>☐ ☐ ☐</td>
<td>C06. Working with Acutely Toxic Chemicals. (GHS H300, H310, H330)</td>
<td>Spills, splashes, ingestion, inhalation, absorption. Chemicals pose a high level of immediate health risk</td>
<td>✓ Safety glasses                             ✓ Chemical resistant gloves ✓ Lab coat (plus chemical protective apron for H330)</td>
<td>All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>☐ ☐ ☐</td>
<td>C07. Working with an apparatus with contents under pressure or vacuum.</td>
<td>Eye or skin damage.</td>
<td>✓ Safety glasses                          ✓ Face shield (for high risk activities) ✓ Chemical-resistant gloves ✓ Lab coat ✓ Chemical-resistant apron (for high risk activities).</td>
<td>In adjacent area within ___ meters. ✓ Safety glasses ✓ Lab coat</td>
</tr>
</tbody>
</table>
### Chemical Hazards

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>C08. Working with pyrophoric (air reactive) chemicals or chemicals that in contact with water releases flammable gasses (water reactive). (GHS H25x and H26x)</td>
<td>Severe skin and eye damage. Fire.</td>
<td>For work outside glove boxes: ✓ Safety glasses ✓ Face shield ✓ FR rated outer gloves ✓ Chemical-resistant inner gloves ✓ NFPA 2112 Flame Resistant (FR) lab coat. Work in inert atmosphere when possible.</td>
<td>All personnel in laboratory room: ✓ Safety glasses ✓ NFPA 2112 Flame Resistant (FR) lab coat.</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>C09. Working with potentially explosive chemicals. (e.g. Nitrates, Perchlorates, Azides, Nitrites etc.)</td>
<td>Splash, detonation, flying debris, skin and eye damage, fire.</td>
<td>✓ Safety glasses ✓ Face shield, and/or use blast shield ✓ Chemical-resistant gloves ✓ NFPA 2112 Flame Resistant (FR) lab coat</td>
<td>All personnel in laboratory room: ✓ Safety glasses (or goggles) ✓ NFPA 2112 Flame Resistant (FR) lab coat.</td>
</tr>
<tr>
<td>No</td>
<td>C10. Minor chemical spill cleanup</td>
<td>Skin or eye damage, respiratory damage.</td>
<td>✓ Safety glasses ✓ Chemical-resistant gloves ✓ Shoe covers ✓ Chemical-resistant apron ✓ Lab coat</td>
<td>In adjacent area within ___ meters. ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>No</td>
<td>C11. Major chemical spill cleanup</td>
<td>Multiple hazards.</td>
<td>Call for EH&amp;S assistance.</td>
<td>All personal evacuate lab</td>
</tr>
<tr>
<td>No</td>
<td>C12. Working with known or suspect human carcinogens (GHS H350, H351)</td>
<td>Spills, splashes, ingestion, inhalation, absorption. High hazard cancer-causing agents</td>
<td>✓ Safety glasses ✓ Chemical-resistant gloves ✓ Lab coat</td>
<td>In adjacent area within ___ meters: ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>No</td>
<td>C13. Working with reproductive hazards (GHS H340, H341, H360, H361)</td>
<td>Spills, splashes, ingestion, inhalation, absorption. Agents that affect reproductive capabilities, cause mutation and adversely affect fetal development</td>
<td>✓ Safety glasses ✓ Chemical-resistant gloves ✓ Lab coat</td>
<td>In adjacent area within ___ meters: ✓ Safety glasses ✓ Lab coat</td>
</tr>
</tbody>
</table>
## Appendix B - Laboratory Hazard Assessment Tool
(Non-Mandatory)

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
</table>
| Yes                | No             |                  | yes Chemical Splash goggles
                  | yes Chemical-resistant gloves
                  | yes Lab coat     | All personnel in laboratory room:
                  |                 | Inhalation, exposure, dermal exposure. | yes Safety glasses
                  |                 |                                 | yes Lab coat             |
| ☐                  | ☐              | C14. Working with engineered nanomaterials. |                                   |                         |
## Appendix B - Laboratory Hazard Assessment Tool
*(Non-Mandatory)*

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
</table>
| Yes                | P01. Working with cryogenic liquids. | Major skin, tissue, or eye damage. | ✓ Safety glasses (goggles for large volumes)  
✓ Face shield  
✓ Cryogenic protective gloves  
✓ Lab coat | N/A |
| No                 |                 |                  |                                           |                          |
| Yes                | P02. Removing freezer vials from liquid nitrogen. | Vials may explode upon rapid warming. Cuts to face/neck and frostbite to hands. | ✓ Safety glasses  
✓ Face shield  
✓ Cryogenic protective gloves  
✓ Lab coat | N/A |
| No                 |                 |                  |                                           |                          |
| Yes                | P03. Working with very cold equipment or dry ice. | Frostbite, hypothermia. | ✓ Safety glasses  
✓ Cryogenic protective gloves  
✓ Lab coat (possibly warm clothing) | N/A |
| No                 |                 |                  |                                           |                          |
| Yes                | P04. Working with scalding liquids or hot equipment (e.g. autoclave, water bath, oil bath). | Burns resulting in skin or eye damage. | ✓ Safety glasses (goggles for large volumes)  
✓ Thermal protective gloves (impermeable insulated gloves for liquids and steam)  
✓ Lab coat | N/A |
| No                 |                 |                  |                                           |                          |
| Yes                | P05. Glassware washing. | Lacerations, chemical splash. | ✓ Safety glasses  
✓ Heavy rubber gloves  
✓ Lab coat | N/A |
| No                 |                 |                  |                                           |                          |
| Yes                | P06. Working with loud equipment, noises, sounds, alarms, etc. | Potential ear damage and hearing loss. | ✓ Earplugs or ear muffs as necessary  
✓ Safety glasses  
✓ Disposable gloves  
✓ Lab coat | ✓ Earplugs or ear muffs as necessary |
| No                 |                 |                  |                                           |                          |
| Yes                | P07. Working with a centrifuge. | Imbalanced rotor can lead to broken vials, cuts, exposure. | ✓ Safety glasses  
✓ Disposable gloves  
✓ Lab coat | N/A |
| No                 |                 |                  |                                           |                          |
| Yes                | P08. Working with a sonicator. | Ear damage, exposure. | ✓ Safety glasses  
✓ Disposable gloves  
✓ Earplugs or ear muffs as necessary  
✓ Lab coat | N/A |
<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Physical Hazards</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Activity in lab</td>
<td>Potential Hazard</td>
</tr>
<tr>
<td>☐</td>
<td>☐</td>
<td>P09. Working with sharps (e.g. needles and razor blades.)</td>
<td>Cuts, exposure.</td>
</tr>
</tbody>
</table>
### Appendix B - Laboratory Hazard Assessment Tool
(Non-Mandatory)

#### Activity performed
- □ I have a BUA that addresses all of these items. Skip to next section.

<table>
<thead>
<tr>
<th>No.</th>
<th>Activity performed</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>□</td>
<td>□</td>
<td>B01. Working with human or non-human primate blood, body fluids, tissues, cells or other potentially infectious material (OPIM) which may contain human blood borne pathogens (BBP).</td>
<td>Exposure to infectious material, sharps injuries</td>
<td>✓ Eye and mucous membrane protection (as appropriate for operations), ✓ Disposable gloves ✓ Disposable lab coat impervious to fluids</td>
<td>In adjacent area within ___ meters: ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>□</td>
<td>□</td>
<td>B02. Working with microbial agents (bacteria, virus, parasites, yeast, fungi, prions), recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 1 microbial agents or recombinant DNA. (BSL-1)</td>
<td>Eye irritation, sharps injury. Exposure of infectious material to those who may have personal health issues which make them more susceptible to infection; cross contamination of animal or extra laboratory areas.</td>
<td>✓ Safety glasses ✓ Disposable gloves ✓ Lab coat</td>
<td>In adjacent area within ___ meters: ✓ Safety glasses ✓ Lab coat</td>
</tr>
<tr>
<td>□</td>
<td>□</td>
<td>B03. Working with microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 2 microbial agents or recombinant DNA. (BSL-2)</td>
<td>Exposure to infectious material, particularly through broken skin or mucous membranes, sharps injuries.</td>
<td>✓ Safety glasses Double layer of disposable gloves ✓ Lab coat</td>
<td>All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat.</td>
</tr>
<tr>
<td>□</td>
<td>□</td>
<td>B04. Working microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 2 microbial agents or recombinant DNA for which Biosafety Level 3 practices are required. (BSL-2+)</td>
<td>Exposure to infectious materials with high risk of exposure by contact with skin or mucous membranes and/other potential or unknown routes of entry and or increased consequences of exposure. Sharps injuries.</td>
<td>✓ Safety glasses Double layer disposable gloves ✓ Lab coat or disposable lab coat</td>
<td>All personnel in laboratory room: ✓ Safety glasses ✓ Lab coat or disposable lab coat.</td>
</tr>
</tbody>
</table>
## Appendix B - Laboratory Hazard Assessment Tool

### (Non-Mandatory)

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Biological Hazards</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Activity in lab</td>
<td>Potential Hazard</td>
</tr>
<tr>
<td>☐</td>
<td>☐</td>
<td>B05. Working with microbial agents, recombinant DNA and/or biological materials (cells, tissues, fluids) exposed to or likely to contain Risk Group 3 microbial agents or recombinant DNA. (BSL-3)</td>
<td>Exposure to infectious materials with high risk of exposure, particularly through the inhalation route.</td>
</tr>
<tr>
<td>☐</td>
<td>☐</td>
<td>B06. Working with live animals-alone or in conjunction with Risk Group 1 microbial agents or recombinant DNA. (ASBL-1)</td>
<td>Animal bites, allergies, eye irritation, sharps injury. Exposure of infectious material to those who may have personal health issues which make them more susceptible to infection; cross contamination of animal or extra laboratory areas.</td>
</tr>
<tr>
<td>☐</td>
<td>☐</td>
<td>B07. Working infected or potentially infectious live animals-alone or in conjunction with Risk Group 2 microbial agents or recombinant DNA (or materials exposed to RG-2 agents). (ABSL-2)</td>
<td>Animal bites, exposure to infectious material, allergies, sharps injury.</td>
</tr>
</tbody>
</table>
**Appendix B - Laboratory Hazard Assessment Tool**  
*(Non-Mandatory)*

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
</table>
|     |    | R01. Working with unsealed radioactive materials including generally licensed radioactive material or devices (e.g., uranyl acetate, uranyl nitrate, thorium, nitrate). | Cell damage, potential spread of radioactive materials. | ✓ Safety glasses  
✓ Impermeable gloves or chemical resistant gloves  
✓ Lab coat | In adjacent area of ___meters.  
✓ Safety glasses  
✓ Lab coat |
|     |    | R02. Working with unsealed radioactive materials in hazardous chemicals (corrosives, flammables, liquids, powders, etc.). | Cell damage or spread of contamination plus hazards for the specific chemical. | ✓ Safety glasses (goggles for splash hazard)  
✓ Chemical-resistant gloves  
✓ Lab coat | In adjacent area of ___meters.  
✓ Safety glasses  
✓ Lab coat |
|     |    | R03. Working with radioactive sealed sources or devices containing sources of radioactive materials (e.g., liquid scintillation counters, gas chromatographs/electron capture detectors, static eliminators, etc.) | If sealed source is compromised due to removal from equipment or physical abuse: cell damage, potential spread of radioactive materials. | PPE is not necessary under normal operating instructions.  
Note: Source may not be removed form device except by EH&S or manufacturer. | N/A |
## Appendix B - Laboratory Hazard Assessment Tool
(Non-Mandatory)

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td><strong>N01. Working with ultraviolet radiation.</strong></td>
<td>Conjunctivitis, corneal damage, skin redness.</td>
<td>✓ UV face-shield with correct OD value ✓ Opaque gloves ✓ Lab coat</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td><strong>N02. Working with infrared emitting equipment (e.g. glass blowing).</strong></td>
<td>Cataracts, burns to cornea.</td>
<td>✓ Appropriate shaded glasses ✓ Lab coat</td>
</tr>
</tbody>
</table>
## Appendix B - Laboratory Hazard Assessment Tool  
(Non-Mandatory)

| Activity performed | Activity in lab                                                                 | Potential Hazard                      | Active Researcher PPE  
(Direct Manipulation)                                                                 | Adjacent Individuals PPE |
|---------------------|--------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------------------|------------------------|
| Yes                 | L01. Open Beam- Performing alignment, trouble-shooting or maintenance that requires working with an open beam and/or defeating the interlock (s) on any Class 3 or Class 4 laser system. | Eye damage                           | ✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. | All personnel in laser use room:  
✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. |
| No                  |                                                                                 |                                       |                                                                      |                        |
| No                  | L02. Open Beam- Viewing a Class 3R laser beam with magnifying optics.           | Eye damage                           | ✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. | N/A                    |
| No                  | L03. Open Beam- Working with a Class 3B laser open beam system with the potential for producing direct or specular reflections. | Eye damage                           | ✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters. | All personnel in laser use room:  
✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.  
Appropriate skin protection. |
| No                  | L04. Open Beam- Working with a Class 4 laser open beam system with the potential for producing direct, specular or diffuse reflections. | Eye damage, skin damage               | ✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.  
✅ Appropriate skin protection. | All personnel in laser use room:  
✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.  
Appropriate skin protection. |
| No                  | L05. Non-Beam - Handling dye laser materials, such as powdered dyes, chemicals, and solvents. | Cancer, explosion, fire.              | ✅ Gloves, safety glasses, flame-resistant lab coat or coveralls       | In adjacent area within  
___ meters.  
✅ Safety glasses  
✅ Lab coat |
| No                  | L06. Non-Beam- Maintaining and repairing power sources for large Class 3B and Class 4 laser. | Electrocution, explosion fire         | ✅ Electrical isolation mat,  
✿ Flame-Resistant NEC 70E APC rated lab coat or coveralls                    | N/A                    |
| No                  | L07. Enclosed Beam- Using a Class 1 device housing a Class 3B or Class 4 enclosed or embedded laser with the potential for beam exposure during a Service Event. | Eye damage, skin damage               | ✅ Appropriate protective eyewear, wave length and optical density based on individual beam parameters, appropriate skin protection. | All personnel in laser use room:  
✅ Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.  
Appropriate skin protection. |
Appendix B - Laboratory Hazard Assessment Tool  
(Non-Mandatory)

<table>
<thead>
<tr>
<th>Activity performed</th>
<th>Unique or Lab Specific Activities</th>
</tr>
</thead>
</table>

If your lab conducts any additional or unique activities that are not listed above, identify the potential hazards and appropriate PPE then add these activities to the table below. If a lab activity is similar to but somewhat different than one of the common activities listed, include it in this section as well.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Activity in lab</th>
<th>Potential Hazard</th>
<th>Active Researcher PPE (Direct Manipulation)</th>
<th>Adjacent Individuals PPE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B - Laboratory Hazard Assessment Tool
(Non-Mandatory)

Hazard Assessment Certification: This ‘certifies’ that you have conducted the hazard assessment. Maintain a copy of the signed hazard assessment (this document) in the lab safety records.

Name and title of person conducting assessment

Name: ______________________ Title: ______________________
Date assessment completed: ______________________


Appendix B - Laboratory Hazard Assessment Tool  
(Non-Mandatory)

The following Employees have reviewed the EHS Activity Hazard Assessment Tool specific to this lab and have received the following training:

1. When PPE is necessary
2. What PPE is required
3. How to properly don, doff, adjust and wear PPE
4. The Limitations of PPE
5. The proper care, maintenance, useful life, and disposal of PPE
6. General PPE safety practices of (e.g. not wearing PPE outside the lab)

<table>
<thead>
<tr>
<th>Worker Name</th>
<th>UID</th>
<th>Training Date</th>
<th>Trainer</th>
<th>Worker Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


PPE Policy and Hazard Assessment Tool Development

Following the systemwide meeting, we requested volunteers to help revise the proposed PPE Policy and develop a systemwide hazard assessment tool. A group of interested faculty, researchers, and EHS staff met to revise the proposed UC system-wide PPE Policy at UC Davis on March 19-20, 2013. The faculty participants included the following:

<table>
<thead>
<tr>
<th>Clark</th>
<th>Lagarias</th>
<th>Davis</th>
<th>Professor, Molecular &amp; Cellular Biology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin</td>
<td>Privalsky</td>
<td>Davis</td>
<td>Professor, Microbiology &amp; Molecular Genetics</td>
</tr>
<tr>
<td>Nancy</td>
<td>Wayne</td>
<td>Los Angeles</td>
<td>Professor, Vice Chair Physiology</td>
</tr>
<tr>
<td>Dave</td>
<td>Wemmer</td>
<td>Berkeley</td>
<td>Exec. Asso. Dean, College of Chemistry</td>
</tr>
</tbody>
</table>

Based upon the written comments received as part of the comment period and feedback from the Department Chairs, the following changes were made to the PPE policy.

1. The original policy required that a lab coat and eye protection be worn by all personnel upon entering a laboratory, but allowed exemptions with the approval of the campus EH&S Department. It was noted that due to the major differences in the type of research performed and design of laboratories, over 80% of campus labs would request an exemption from this requirement. While the policy still requires pants and closed toe/heeled shoes to be worn when entering a laboratory, lab coats and eye protection are now required when actively involved in research. Additionally, the lab must determine the “splash” zone area in which other lab personnel will also be required to wear additional PPE. (This change addressed majority of comments regarding this policy).

2. The policy now includes specific exemptions from wearing PPE

   a. Researchers would be permitted to remove protective eye wear when using a microscope.
   b. PPE-free corridors through the lab are delineated.
   c. Non-Hazardous work areas (offices and work stations) are delineated by distance or a physical barrier

3. The policy clarifies that students in a teaching lab are only required to wear PPE when directed by the instructor. The prior language was not clear and seemed to indicate that students had to wear PPE even when taking a written test in a teaching lab.

4. Appendix B was added with a sample Laboratory Hazard Assessment Tool (LHAT) for campuses to use to help evaluate PPE requirements.
The revised PPE policy, and revised Lab Safety Training and Minors in Labs policies, are attached. Also included is a summary of changes. If you have any additional comments regarding these policies, please send to Erike Young at eyoung@ucop.edu.

The group also reviewed the proposed Laboratory Hazard Assessment Tool (LHAT). A faculty member from the UCLA chemistry department demonstrated the electronic version of their campuses LHAT tool. The demonstration was well received by the group and the faculty suggested three key modifications:

- Modify tool to evaluate PPE needed for individuals occupying the adjacent areas.
  - The ability to skip sections if an SOP/Use Authorization is required that outlines the PPE needed, thus removing duplication.
  - Provide additional flexibility for entering custom lab operations where the LHAT tool does not already cover a given activity.

It is our hope that this tool will be available system-wide and will be used by all campuses in the near future.

**RADiCAL**

As indicated in Ken’s email yesterday, we are continuing the effort to develop IT tools to support researchers. In pursuit of this goal UCOP is in the process of forming a steering committee to amend/improve RADiCAL as well as to continue the development of the LHAT. Dr. Craig Merlic has volunteered to serve as the chair of this committee. We are looking for additional faculty to evaluate both IT tools as well as faculty representatives to serve on the LHAT/RADiCAL development committee. Please e-mail Ken Smith ksmith@ucop.edu if you are interested in serving in either capacity.

**Laboratory Safety Fundamentals Course.**

The original course was sent to this group, as well represented employee groups and the Academic Senate, for feedback. The comments were overwhelmingly positive and only minor changes were recommended. This program is now being uploaded in to the campus Learning Management Systems (LMS). It is anticipated that it will activated at each campus at the time the Laboratory Safety Training policy is issued (expected May 2013). The final version will be accessed in the campus LMS but can be previewed at the link below. The latest version now includes a section on Lab Security:

http://info.ucanr.org/safety/Lab_LMS/lab.html

Although the course is now published, the course will be reviewed annually, and appropriate changes will be made. Additionally, the course will be sent to the American Chemical Society’s Division on Chemical Health and Safety this summer to request input for future enhancements.
I. POLICY SUMMARY

This policy governs the presence of minors in any University laboratory or shop that uses hazardous chemicals, biohazardous or infectious materials, radioactive materials or radiation-producing equipment, or where there are physical hazards including (but not limited to) compressed gases, high voltage, extreme temperatures, excessive noise, or lasers.

The policy does not apply to students enrolled in courses listed in a campus course catalog having a laboratory component or in any of the University of California’s educational outreach programs. Outreach programs include students working on science fair projects and other campus or department sponsored events in which minors are participating as part of a larger group.

This policy applies to all minors involved in summer internships, volunteering in research projects and participating in scheduled assignment in a laboratory setting.

This policy sets restrictions on minors' participation based on age ranges. Minors under the age of 14 are not permitted in University of California laboratories or shops, except when participating in an approved and supervised tour. This prohibition extends to the minor children related to laboratory personnel.
This policy sets minimum requirements; each campus may develop more stringent policies and procedures as deemed necessary.

II. DEFINITIONS

**Biological Agents:** Living organisms or products of living organisms such as viruses, bacteria, fungi, prions & parasites.

**Biosafety Level (BSL) Containment Protocols:** Biosafety Levels 1-4 as defined by the National Institutes for Health guidelines, describe containment practices for hazardous chemicals and dangerous materials, based on advice from the federal Centers for Disease Control and Prevention. Containment strategy is linked to the type of facility, appropriate engineering controls, safe work practices, and use of personal protective equipment.

- Biosafety Level 1 containment is prescribed for agents that are not known to cause disease in healthy adult humans.
- Biosafety Level 2 containment is prescribed for agents linked to human disease, but the disease is rarely serious; treatment is often available.
- Biosafety Level 3 containment is prescribed for agents that are linked to serious or lethal human disease; treatment may be available.
- Biosafety Level 4 containment is prescribed for agents that are linked to serious or lethal human disease; treatment is rarely available.

**Controlled Substances:** Narcotic and non-narcotic substances that are regulated under the federal Controlled Substances Act and the California Uniform Controlled Substances Act including but not limited to those substances listed in 21 CFR 1308.11-1308.15

**Laboratory:** As used in this Policy, “laboratory” refers to any part of a building used or intended to be used by the University for scientific or technical activities which may be hazardous; this includes teaching laboratories as well as research laboratories. This policy also covers off-campus facilities, on-and off-campus clinical facilities, and fieldwork locations where approved educational activities are conducted.

**Minor:** An individual under 18 years of age (California Family Code §6500-6502).

**Personal Protective Equipment (PPE):** Personal protective equipment is equipment worn to minimize exposure to a variety of hazards. Examples of PPE include such items as lab coats, gloves, foot protection (steel-toed shoes), eye protection (safety glasses or goggles), protective hearing devices (earplugs, muffs), hard hats, respirators, fall protection harnesses, etc.

**Shop:** As used in this Policy, a place where machinery and tools are used. “Shops” include but are not limited to engineering shops, art workshops, and other sites.

**Vivarium:** A facility where live animals or plants are housed.
III. POLICY TEXT

The University of California is committed to providing a healthy and safe environment for all members of the campus community and visiting members of the public.

This policy is meant to protect both the safety of minors and of other laboratory personnel. The principles underlying this policy are:

- Minors may be more susceptible to certain toxic agents and chemicals,
- Minors may be less aware of the potential risks and hazards in laboratories,
- Minors may require supervision and oversight.

The policy does not apply to students enrolled in courses listed in a campus course catalog having a laboratory component or in any of the University of California’s educational outreach programs. Outreach programs include students working on science fair projects and other campus or department sponsored events in which minors are participating as part of a larger group.

This policy is intended as a minimum requirement; each campus may develop more restrictive policies and procedures as deemed necessary. Exceptions to this policy may be granted on a case-by-case basis according to local guidelines, pending review and written approval by the campus Research Vice Chancellor (or designee).

A. Minor children of laboratory personnel are not permitted in laboratories or shops except under one of the following conditions:
   1. In accordance with requirements of Section III.C, or
   2. Laboratory/technical areas which have been designated and posted as free of physical or chemical hazards, or
   3. As part of a campus/department sponsored event, or
   4. For the purpose of escorting a minor child to/from an enclosed office/breakroom located within a laboratory or shop.

B. Minors are never permitted in any setting where research involving controlled substances is being performed, even if they are enrolled students. Persons under age 18 are not permitted in University of California vivaria unless their participation has been reviewed and approved by the campus Institutional Animal Care and Use Committee (IACUC) and the responsible vivarium facility manager based upon criteria established by the campus.

C. Minors between the ages of 14 and 18 are allowed in laboratory settings only when:
   1. They are students enrolled in courses listed in a campus course catalog or part of an approved and supervised tour, or
2. They have written consent from their parent(s) or guardian(s); and, They have received the appropriate University of California safety training and the campus has documented that training; and, They agree to strictly adhere to the campus or laboratory-specific requirements concerning Personal Protective Equipment (PPE); and, They are at all times under the direct supervision of a qualified adult designated for this responsibility.

D. Before their scheduled assignment in a laboratory begins, minors must be trained on specific hazards to which they may be exposed in the laboratory/shop, how to recognize those hazards, and how to protect themselves from those hazards. Minors must be trained on the contents of the laboratory-specific chemical hygiene plan and the standard operating procedures and emergency procedures applicable to their scheduled assignment. Additional training may be required for tasks that involve hazardous chemicals, biological agents, radioactive materials, research animals, and physical hazards. All training must be documented. Refer to the Policy on Laboratory Safety Training.

E. Legal Restrictions Regarding Certain Chemicals, Biological Materials and Radiation

Regulations prohibit minors from using certain chemical, biological, or radiological materials. There are also specific training requirements based on the materials a minor will be handling and/or exposed to. Restrictions on chemical, biological, and radiological materials are as follows.

1. Chemical Safety Restrictions: Minors are not allowed to work with:

   a) Highly hazardous materials, including pyrophorics, explosives, large quantities of flammable materials (i.e., 4 liters or more), and compounds having a rat oral LD$_{50}$ less than or equal to 50 mg/Kg (e.g., hydrofluoric acid, acrylonitrile, osmium tetroxide, etc.)

   b) International Agency for Research on Cancer (IARC) Group 1 or 2A carcinogens or Cal/OSHA-regulated carcinogens

2. Biological Safety Restrictions: Minors may never work with or be present in circumstances requiring BSL-3 or BSL-4 containment. Restrictions for handling potentially biohazardous substances depend on age group:

   a) Persons ages 14 to 16:
      - Are prohibited from handling biohazardous materials that require containment above BSL-1.
May enter a BSL-1 in a large open bay laboratory where BSL-2 work may be taking place, providing they have no contact with the BSL-2 work.

b) Persons ages 16 to 18:
- Are prohibited from handling biohazardous materials that require containment above BSL-2.
- May enter a BSL-2 with appropriate training and medical surveillance (if applicable).

3. **Radiation Safety Restrictions**: Minors are not allowed to handle radioactive materials or radiation-producing machines. PIs must apply to their campus EH&S Radiation Safety Officer ("RSO") for exceptions. Exceptions must be documented in writing.

## IV. COMPLIANCE / RESPONSIBILITIES

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chancellor / Laboratory Director (or Designee)</td>
<td>The Chancellor or LBNL Director or designee is responsible for implementing this policy and location-specific procedures</td>
</tr>
<tr>
<td>Laboratory Supervisor or Principal Investigator</td>
<td>The University academic or staff employee who sponsors a non-student minor’s educational activity must certify adherence to this policy and local implementing procedures on the Minors Performing Research Registration Form. The PI or supervisor must make an evaluation of each physical hazard present in the work environment (e.g., compressed gases, high voltage, extreme temperatures, excessive noise, lasers, etc.) the minor may encounter as part of their scheduled assignment in the laboratory and (1) review the physical hazards with the minor, (2) review safe operating procedures for the equipment with the minor, (3) review emergency procedures for the equipment with the minor, and (4) establish specific and explicit instructions for the scheduled assignment the minor is allowed to perform.</td>
</tr>
<tr>
<td>Location EH&amp;S Personnel</td>
<td>The local EH&amp;S Office is responsible for assisting laboratory personnel in maintaining and monitoring health and safety requirements.</td>
</tr>
<tr>
<td>Human Resources Office</td>
<td>Any policy covered UC employee who oversees minors must have a criminal background check conducted in accordance with University policy and local procedures. Noncompliance with the policy is handled in accordance with Personnel Policies for Staff Members (PPSM) policies 62-65 pertaining to disciplinary actions, Academic Personnel Manual.</td>
</tr>
</tbody>
</table>
(APM) policies 015-016 pertaining to the Faculty Code of Conduct and administration of discipline; APM 140 and 150 pertaining to Non-Senate Academic Appointees, or Collective Bargaining Agreement.

<table>
<thead>
<tr>
<th>Under Age 18-Participant</th>
<th>The participant must undergo required training and complete campus required registration forms.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant’s Parent or Guardian</td>
<td>Parent/guardian must sign campus required registration form, including a release of liability and hold-harmless agreement.</td>
</tr>
</tbody>
</table>

V. PROCEDURES

Principal Investigators or activity sponsors must follow these steps to obtain advance authorization and parental permission before allowing a minor to participate in research activities, and must ensure that minors under their supervision receive appropriate training about hazardous materials handling requirements and restrictions. Failure to do so will result in corrective action.

A. Obtain written authorization before the minor begins scheduled assignment in the lab in accordance with location-specific policies and procedures, using appropriate forms (e.g., Waiver of Liability, Assumption of Risk and Indemnity Agreement).

B. Provide direct supervision of the minor in the laboratory environment by a qualified adult laboratory supervisor at all times. Ensure supervision requirements are observed. "Direct supervision" means while entering, leaving or in the laboratory, the minor is physically accompanied at all times by a trained and knowledgeable supervisor.

C. Review emergency procedures with the minor. Show the minor the following emergency equipment and locations: (Refer to the Laboratory Site Safety Orientation in the Policy on Laboratory Safety Training)
   - Telephone and emergency phone numbers,
   - First-aid kit,
   - Eye wash and emergency shower,
   - Fire alarm pull stations and fire extinguishers,
   - Building exits,
   - Where to assemble outside in case of building evacuation.

D. Provide general and laboratory specific safety training.

As the Principal Investigator / Supervisor you must confirm that the minor receive appropriate laboratory safety training by doing the following:
   - Assure that the minor completes campus-specific safety training before the minor begins scheduled assignment,
University of California Policy
Minors in Laboratories and Shops

- Explain hazards specific to your lab, equipment, and the materials the minor may handle; e.g.
  - Show the minor how to access and understand Safety Data Sheets (SDS) for the chemicals with which they will utilize.
  - Explain possible routes of exposure, as appropriate (e.g., skin absorption, ingestion, inhalation) and precautionary measures precautions to limit exposures.
  - Evaluate each potential hazard present in the work environment (e.g., compressed gases, high voltage, extreme temperatures, excessive noise, lasers, etc.) the minor may encounter as part of their scheduled assignment in the laboratory and
    (1) review the potential hazards,
    (2) review safe operating procedures for the equipment,
    (3) review emergency procedures for the equipment, and
    (4) establish specific and explicit written instructions (Standard Operating Procedures) for the work the minor is allowed to perform.
  - Provide appropriate PPE and engineering controls, and train the minor in their proper use.
  - Maintain all safety training documentation and Release of Liability forms in the lab's files in accordance with campus policy.

VI. RELATED INFORMATION

Minors in Labs Registration Packet (samples)
  Release of Liability, Waiver of Claims, Express Assumption of Risks and Hold Harmless Agreement (form)
  Notification of Possible Hazards to Minors Performing Research (“Potential Hazard Information Sheet”)
  Rules for Minors in Laboratories and Shops
  Minors Research Proposal Project Registration Form

University Policy on Management of Health, Safety and the Environment

Centers for Disease Control, Biosafety in Microbiological and Biomedical Laboratories (http://www.cdc.gov/biosafety/publications/bmbl5/index.htm)

Personnel Policies for Staff Members 62, 63, 64, 65, and 67

VII. FREQUENTLY ASKED QUESTIONS

Not Applicable.
VIII. REVISION HISTORY

This is the first version of this Policy.
RELEASE OF LIABILITY, WAIVER OF CLAIMS, EXPRESS ASSUMPTION OF RISKS, AND HOLD HARMLESS AGREEMENT

I HAVE READ, UNDERSTAND, and INITIALED the documents Rules for a Minors Working in Laboratories and Shops and Potential Hazard Information Sheet describing the potential risks and dangers associated with my child’s research project. I fully understand that there are potential risks and hazards associated with exposure to hazardous materials or substances.

I AGREE TO ALLOW my minor child to participate on a scheduled assignment in the University of California laboratories and freely accept and assume all associated risks and hazards. I ALSO AGREE AND UNDERSTAND that my child’s research project may be suspended at any time, at the discretion of the University of California and its officers, agents, and employees, if the safety of my child, University of California employees and/or other volunteers at the University of California become a concern.

I, for myself and my estate, heirs, administrators, executors, and assigns, hereby release and hold harmless the State of California, the UC Board of Regents, and their officers, directors, employees, representatives, agents, and volunteers (collectively, the “Releases”), from any and all liability and responsibility whatsoever, however caused, for any and all damages, claims, or causes of action that I, my estate, heirs, administrators, executors, or assigns may have for any loss, illness, personal injury, death, or property damage arising out of, connected with, or in any manner pertaining to my child’s scheduled assignment in the University of California laboratories, whether caused by the negligence of Releases or otherwise. I further hereby agree to defend, indemnify and hold harmless the Releases from any judgment, settlement, loss, liability, damage, or costs, including court costs and attorney fees that Releases may incur.

In signing this agreement, I acknowledge and represent that I have read and understand it and that I sign it voluntarily and for full and adequate consideration, fully intending to be bound by the same.

_____________________________________
Printed Name of Minor Child

Signature of Parent/Legal Guardian

Printed Name of Parent/Legal Guardian

Date

I have read, understand, and will adhere to the University of California Minors in Laboratories and Shops Policy. I understand that failure to comply with this Policy is dangerous to my health and safety and that I may be removed from the facility immediately for any failures or deviations in compliance.

Signature of Minor

Date
<table>
<thead>
<tr>
<th>Type</th>
<th>Characteristics/potential hazards</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td>Refined compound that may be in the form of a solid, liquid or gas. These may or may not be hazardous. Some compounds may have numerous hazard classifications (e.g., flammable, toxin &amp; carcinogen)</td>
<td>Carcinogens: may cause cancer with long term exposure - usually many years in the future</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Benzene</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alcohol, thalidomide, X-rays</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neurotoxins: may affect the nervous system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethidium bromide, snake venom</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flammables: may burn or explode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acetone, Xylene, Alcohol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reactives: may react explosively</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Peroxides, acrylamide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Corrosives: may cause tissue damage through inhalation or direct contact with eyes, skin, etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acids &amp; Bases</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toxins: may cause illness or death on exposure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cyanide</td>
</tr>
<tr>
<td>Compressed Gases</td>
<td>Gases frequently housed in large &amp; heavy high-pressure cylinders. The gas itself may be harmless, toxic, corrosive, flammable</td>
<td>Physical hazard:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Explosion hazard upon rupture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asphyxiant hazard if gasses enter workplace &amp; displace oxygen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asphyxiant: nitrogen, helium, any other non-oxygen gas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flammable: hydrogen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toxic: ammonia</td>
</tr>
<tr>
<td>Radiation / Radioactive Materials</td>
<td>High energy particles (alpha &amp; beta) or photon (X-rays, gamma)</td>
<td>Tissue &amp; Organ damage with high doses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Uranium, Phosphorus-32, Sodium-35, X-rays</td>
</tr>
<tr>
<td>Physical Hazards</td>
<td>Exposure to noise, machinery, heat, cold, etc.</td>
<td>Tissue damage, hearing loss</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scraps, cuts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cold: liquid nitrogen, dry ice</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heat: burners</td>
</tr>
<tr>
<td>Lasers</td>
<td>Light Amplification by Stimulated Emission of Radiation</td>
<td>Eye damage and possible skin damage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Class IIIIB and IV, and open beam laser operation</td>
</tr>
<tr>
<td>Biological Agents</td>
<td>Living organisms or products of living organisms such as viruses, bacteria, fungi, prions &amp; parasites. Hazards from infection are organism dependent &amp; may range from mild treatable to severe untreatable. Hazards are classified according to recommended containment protocol.</td>
<td>Biosafety Level 1 - No hazard</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biosafety Level 2 - Mild to severe illness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biosafety Level 3 – Severe illness &amp; possible death</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biosafety Level 4 – Fatal disease</td>
</tr>
<tr>
<td>Recombinant DNA</td>
<td>Genetically modified organisms.</td>
<td>Scant scientific knowledge as to effects once introduced to the human body.</td>
</tr>
<tr>
<td>Toxins – Microbial, Plant, Animal</td>
<td>Poisonous substances produced by plants, living organisms or animals.</td>
<td>Tissue &amp; organ damage or death.</td>
</tr>
</tbody>
</table>
RULES FOR MINORS IN LABORATORIES AND SHOPS

1. Never participate on a scheduled assignment alone in any laboratory environment without direct, immediate adult supervision from the sponsor or someone designated by the sponsor.

2. Complete and follow safety training specific to the hazards in the laboratory.

3. Always wear the personal protective equipment as directed and dispose of it appropriately. This personal protective equipment (PPE) includes goggles, gloves, coats/gowns, and other face/body protection as dictated by the hazard being worked with or around. Always remove PPE when leaving the work area.

4. Always follow the instructions of the sponsor or laboratory supervisor.

5. Always report any accident (regardless of severity) immediately to the sponsor or laboratory supervisor.

6. Always keep your hands away from your face and wash them well with soap and water prior to leaving any laboratory area and after removing gloves.

7. Never eat, drink, chew gum, apply lip balm, or touch contact lenses while in any laboratory environment.

8. Always wear closed-toe shoes while in any laboratory.

9. Always tie back long hair to keep it out of all the hazards listed above.

10. Always wear clothing that reduces the amount of exposed skin.

11. Always ask questions if you don’t understand the safety requirements.

Printed Name of Minor Child

_____________________________________

Signature of Minor

_____________________________________

Signature of Parent/Legal Guardian Printed Name of Parent/Legal Guardian

________________________

Date
Minors Research Proposal Registration Form

Proposals are due to the Department Chair at least 2 weeks prior to the beginning of the project.

Principal Investigator/Sponsor Name __________________________ Department: __________________________
Phone: __________________________ Email: __________________________
Student/Minor Name: __________________________ Date of Birth: __________________________

The nature of this project is (check one)
□ Student Intern □ Volunteer
□ Other (specify) __________________________

□ Part of a University of California Sponsored Program (which program?) __________________________

Location: Bldg. ______ Room(s) ______________

Materials and Equipment to be Used
Check and List all that apply:

<table>
<thead>
<tr>
<th>Chemicals</th>
<th>Biological Material</th>
<th>Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Flammable</td>
<td>□ Recombinant DNA</td>
<td>□ Fume Hood</td>
</tr>
<tr>
<td>□ Reactive</td>
<td>□ Bacteria</td>
<td>□ Biosafety Cabinet</td>
</tr>
<tr>
<td>□ Carcinogenic</td>
<td>□ Viruses</td>
<td>□ Laminar Clean Bench</td>
</tr>
<tr>
<td>□ Toxic</td>
<td>□ Fungi</td>
<td>□ Autoclave</td>
</tr>
<tr>
<td>□ Corrosive</td>
<td>□ Parasites</td>
<td>□ Centrifuge</td>
</tr>
<tr>
<td>□ Oxidizer</td>
<td>□ Human Source Material</td>
<td>□ Analytical Instruments</td>
</tr>
<tr>
<td>□ Cryogen</td>
<td>□ Insects</td>
<td>□ Industrial Machinery</td>
</tr>
<tr>
<td>□ Pharmaceuticals</td>
<td>□ Plants</td>
<td>□ Noise Producing Equip.</td>
</tr>
<tr>
<td>□ Gasses</td>
<td>□ Animals</td>
<td>□ Other Equipment</td>
</tr>
</tbody>
</table>

I AGREE TO SPONSOR (MINOR’S NAME) __________________________, AND BY MY SIGNATURE BELOW, AGREE THAT:

- I have read, understand, and will adhere to the “Minors in Laboratories and Shops” Policy. The potential hazard information signature sheet is attached.
- I will ensure that this Minor’s Hazard Specific Safety Training is completed and documented.
- Personal protective equipment appropriate for, and specific to, laboratory hazards will be provided.
- This individual will be supervised at all times while in the laboratory and never left alone.
- My laboratory is in full compliance with all applicable University of California safety programs and regulations.
- I understand that my failure to adhere to the “Minors in Laboratories and Shops” Policy may result in my receiving corrective action or discipline, up to and including dismissal.

Printed Name of PI/Sponsor __________________________ Date __________________________
Signature of PI/Sponsor __________________________ Date __________________________

Department Chair Approval (if required)

Printed Name of Department Chair __________________________ Date __________________________
Signature of Department Chair __________________________ Date __________________________
Retain for 3 years
Prompted by recent changes in safety policy in the Depart of Chemistry, we are in the process of overhauling our lab's safety practices. These changes include:

- Implementing standard operating procedures for hazardous chemical classes.
- Reassessing lab policies on personal protective equipment in mixed use spaces (e.g. using while using a bench-top spectrometer.)
- Building an online user database to ensure outside users are aware of changes in safety policy and have access to SOPs and other important documentation.

The chemical SOPs cover the most hazardous classes of chemicals present in our lab, and includes information on symptoms of exposure, relevant personal protective equipment and ventilation, special handling and spill procedures, waste disposal, required approvals, and a detailed protocol on the allowed and disallowed uses for that class of chemicals. Although these SOPs were drafted in collaboration with the Chemistry Department and an outside safety contractor, many our lab's protocols are significantly more restrictive than required by the Department of Chemistry. For example, corrosives are permitted for use only as listed in procedural SOPs, in this case HCl may only be used in our ITO acid-etch procedure and phosphoric acid may only be used in cleaning the glovebox H2O sensor. After final drafts were approved, we discussed the SOPs during a series of group meetings to ensure that all lab members were aware of the new procedures.

During these meetings, we had several group discussions about what constitutes appropriate personal protective equipment for different scenarios. For example, wearing goggles when working in the glovebox may actually be less safe, because fog or glare from the goggles may make it harder to see what you are doing and thus easier to spill or break something, while providing almost no additional safety benefit. We concluded that the safest option would be to require different PPEs in different parts of the lab. We are still discussing the best way of implementing this while still adhering to all safety requirements.

Finally, much of the equipment in our lab is used by students and staff from other research groups. To ensure that these users were aware of modifications to our safety protocols and to simplify equipment training and record-keeping, we are in the process of implementing a new online user database. This database allows us to keep track of what equipment each user has been trained on, provides access to SOPs and a reservations calendar, and simplifies the task of ensuring outside users are up to date on lab and equipment policies. For example, if we modify our PPE requirements or if an instrument is down or temporarily requires a special procedure, we can easily send all the relevant users an email. This database is built through Google Docs and is easy to update and manage. You can see it here: https://docs.google.com/forms/d/1nFrLJTkVdrOADRnXJ3Eo2qaYUwhgXqtN20e0XFrLJE/viewform?si=2009496958661e58&token=877i2z0BAAA.RgPSai4RkYtM3c4cBDNkfg.gS2bmy5onnZYm313IK1vHQ

Lab Members for Spring 2012

Graduate Students: Ian Jacobs, John Roehling, Chris Rochester, Jun Li, Joesph Sit.
Undergrad Students: Oliver Lin, Steven Kawula, Yue Yang, Stephanie Burg, Sean Carrillo, Daniel Nguyen, Sean Hessom