Laboratory Assessment Tool

Assessment Date: 11/06/2015
Principal Investigator: Kam, Lance

Please post a signed copy of the LATCH in the lab where it can be easily accessed by all laboratory personnel and maintain the original on file.

A Chemical Hygiene Plan (CHP) is required per OSHA's Occupational Exposure to Hazardous Chemicals in Laboratories standard (29 CFR 1910.1450) and Columbia University policy. The CHP provides essential information for prevention of potential exposures to hazardous materials and physical hazards in the laboratory. Columbia University has developed a Chemical Hygiene Plan to provide an overview of information about the use of hazardous materials in research laboratories, their hazards, warning signs, control measures, safety training to minimize exposure and waste management. LATCH is your laboratory-specific complement to the Columbia University Chemical Hygiene Plan.

After review, please sign and date below.

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alex Dang</td>
<td><a href="mailto:apd2140@columbia.edu">apd2140@columbia.edu</a></td>
<td></td>
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</tr>
<tr>
<td>Weiyang Jin</td>
<td><a href="mailto:wj2203@columbia.edu">wj2203@columbia.edu</a></td>
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<tr>
<td>Lance Kam</td>
<td><a href="mailto:lk2141@columbia.edu">lk2141@columbia.edu</a></td>
<td></td>
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</tr>
<tr>
<td>Lester Lambert</td>
<td><a href="mailto:lh2127@columbia.edu">lh2127@columbia.edu</a></td>
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<tr>
<td>Ha Eun Lee</td>
<td><a href="mailto:hl2898@columbia.edu">hl2898@columbia.edu</a></td>
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<tr>
<td>Joung Lee</td>
<td><a href="mailto:jl3728@columbia.edu">jl3728@columbia.edu</a></td>
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<td>Jinglun Yuan</td>
<td><a href="mailto:jy2735@columbia.edu">jy2735@columbia.edu</a></td>
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<tr>
<td>Shuqing Zhao</td>
<td><a href="mailto:sz2273@columbia.edu">sz2273@columbia.edu</a></td>
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</table>
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Equipment

Key safety and equipment available in each laboratory space covered by this LATCH is identified below. This equipment must remain accessible to all laboratory personnel at all times the laboratory is in use and the equipment must remain in proper working order.

<table>
<thead>
<tr>
<th>Morningside - Engineering Terrace - Room: 399A</th>
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<tbody>
<tr>
<td><strong>Asset Type</strong></td>
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Hazard Assessment

The Hazard Assessment is designed to identify potential hazards specific to the laboratory personnel present in the spaces covered by this LATCH and provide recommendations for administrative and engineering controls, as well as personal protective equipment (PPE), to eliminate or minimize potential exposures.

LASER Hazards

**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.

*Room:* MS: ENGI - 399A

*Hazard:* Eye damage.

*Engineering Controls:* Use barriers, curtains, and beam stops; closed doors when LASER is in use; Ground Fault Interrupters.

*Administrative Controls:* Restricted access; procedural controls; LASER "on" sign; restricted operation; warning signs and labels; Do not wear metallic objects.

*PPE:* Appropriate protective eyewear, wavelength and optical density based on individual beam parameters.

Physical Hazards

**Working with very cold equipment or dry ice**

*Room:* MS: ENGI - 399A

*Hazard:* Frostbite, hypothermia

*Engineering Controls:* Work with material or equipment in a laboratory or laboratory support areas with adequate air exchanges. Allow Dry Ice to sublimate in certified fume hood or glove box.

*Administrative Controls:* Develop & follow task specific SOP; Do not store dry ice in cold rooms

*PPE:* Fire resistant lab coat (such as Nomex), Safety glasses, Insulated gloves

**Removing freezer vials from liquid nitrogen.**

*Room:* MS: ENGI - 399A

*Hazard:* Extreme cold can result in frostbite. Rapid expansion of liquid cryogens can rupture vials, releasing the contents or creating a projectile. Vials may explode upon rapid warming; cuts to face/neck and frostbite to hands.
**Engineering Controls:** Store and work with material in a laboratory or laboratory support areas with adequate air exchanges. Always use vials with a gasket (O-ring) designed for safe liquid storage. Remove sample vials to an enclosure, such as a certified biological safety cabinet or fume hood for thawing.

**Administrative Controls:** Move vials from liquid phase storage to vapor phase storage for 12-24 hours to allow any liquid cryogen in the sample vials to evaporate safely.

**PPE:** Fire resistant lab coat (such as Nomex), Safety goggles without holes, face shield, Impermeable insulated gloves

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**Laboratory uses a centrifuge**

**Room:** MS: ENGI - 399A

**Hazard:** Cuts; ocular hazards

**Engineering Controls:** Work with equipment in a laboratory or laboratory support area with adequate air exchanges. Use door latch.

**Administrative Controls:** Ensure door latch is in working order before using centrifuge. Inspect tubes for cracks and ensure that all caps are closed; Only open centrifuge after rotor has stopped; Maintain equipment as per manufactures guide

**PPE:** Fire resistant lab coat (such as Nomex), Appropriate gloves, Appropriate protective eyewear, wavelength and optical density based on individual beam parameters

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**Laboratory has a sonicator.**

**Room:** MS: ENGI - 399A

**Hazard:** Hearing damage ingestion of aerosols

**Engineering Controls:** Work with equipment in a laboratory or laboratory support areas with adequate air exchanges. Use barriers, vibration isolation system or enclosures.

**Administrative Controls:** Allow sonicated material to sit for 5 minutes to prevent ingestion of aerosols. Maintain equipment as per manufactures guide.

**PPE:** Hearing protection

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**Working with compressed gas cylinders.**

**Room:** MS: ENGI - 399A

**Hazard:** Uncontrolled pressure release can cause personal injury or property damage.

**Engineering Controls:** Store and work with material in a laboratory or laboratory support areas with adequate air exchanges. Secure compressed gas cylinders to a wall or bench by using a mounting bracket.

**Administrative Controls:** Keep regulators in good condition cap cylinders that are not in use or attached to equipment keep upright.

**PPE:** Safety glasses

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**Working with hot liquids, equipment, or open flames (autoclave, Bunsen burners, water or oil bath)**
Room: MS: ENGI - 399A

Hazard: Burns resulting in skin or eye damage

Engineering Controls: Work with material in a laboratory or laboratory support areas with adequate air exchanges.

Administrative Controls: Develop & follow task specific SOPs; Use & maintain equipment as per manufactures guide; Do not use mercury containing thermometers; Do not heat liquids above flash point.

PPE: Fire resistant lab coat(such as Nomex), Safety glasses, Impermeable insulated gloves

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Glassware washing

Room: MS: ENGI - 399A

Hazard: Lacerations

Engineering Controls: Work in a laboratory or laboratory support areas with adequate air exchanges.

Administrative Controls: Develop & follow task specific SOPs Use plastic disposable ware when possible.

PPE: Fire resistant lab coat(such as Nomex), Heavy rubber gloves

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Working with loud equipment, noises, sounds, or alarms, etc.

Room: MS: ENGI - 399A

Hazard: Potential ear damage and hearing loss

Engineering Controls: Lubricate machinery and equipment Place a barrier between the noise source and employee (i.e. sound walls or curtains) Consider vibration isolation system.

Administrative Controls: Develop & follow task specific SOPs. Limit workers exposures through techniques such as using job-rotation schedules that reduce the time an individual may be exposed. Operating noisy machines during shifts when fewer people are exposed. Restricting worker presence to a suitable distance away from noisy equipment.

PPE: Hearing protection

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Working with cryogenic liquids.

Room: MS: ENGI - 399A

Hazard: Major skin, tissue, or eye damage.

Engineering Controls: Store and work with material in a laboratory or laboratory support areas with adequate air exchanges.

Administrative Controls: Oxygen monitor if greater than 60 gallons of liquid nitrogen present.

PPE: Fire resistant lab coat(such as Nomex), Safety goggles without holes, face shield, Safety glasses, Impermeable insulated gloves
Biological Hazards

Working with or human or primate blood, body fluids, unfixed tissue, cell lines, or blood borne pathogens (BBP)

Room: MS: ENGI - 399A

Hazard: Exposure to blood borne pathogens

Engineering Controls: Work within a certificed biological safety cabinet; Use engineered sharps

Administrative Controls: Medical surveillance; Immunization and Chemoprophylaxis where possible. Follow BPP Exposure Control Plan.

PPE: Nitrile gloves, Lab coat, Safety goggles with face shield or facemask plus goggle

Working with live animals (Animal Biosafety Level 1, ABSL-1)

Room: MS: ENGI - 399A

Hazard: Animal bites, allergies

Engineering Controls: Use Animal restraints; Use Engineered sharps

Administrative Controls: Develop & follow task specific SOPs

PPE: Safety glasses, Nitrile, or vinyl gloves, Wire mesh gloves, Lab coat

Working with recombinant DNA, cell lines, viruses, bacteria, or other agents as Biosafety Level 1 (BSL-1)

Room: MS: ENGI - 399A

Hazard: Eye or skin irritation

Engineering Controls: Use engineered sharps

Administrative Controls: Follow BSL Level 1 protocols. Register rDNA work with Institutional Biosafety Committee through RASCAL Appendix A.
https://www.rascal.columbia.edu/

PPE: Safety glasses, Lab coat, Nitrile gloves for broken skin or skin rash

Manipulation of recombinant DNA, viral vectors, cell lines, viruses, bacteria, or other agents classified as Biosafety Level 2 (BSL-2)

Room: MS: ENGI - 399A

Hazard: Exposure to infectious materials, particularly through broken skin or mucous membranes

Engineering Controls: Use engineered sharps

Administrative Controls: Medical surveillance. Follow BSL Level 2 Protocols. Register rDNA work with Institutional Biosafety Committee through RASCAL Appendix A.
https://www.rascal.columbia.edu/
PPE: Nitrile gloves, Safety glasses, Lab coat

**Chemical Hazards**

**Working with small volumes (< 1L) of organic solvents, oxiders or non-acutely toxic liquids**

*Room:* MS: ENGI - 399A

*Hazard:* Skin or eye damage low poisoning potential through skin absorption, inhalation, and/or ingestion

*Engineering Controls:* Work with material on a bench top in a laboratory with adequate air exchanges or inside a certified fume hood lined with absorbent material.

*Administrative Controls:* Substitute with less hazardous chemicals when possible. Order prepared solutions.

*PPE:* Fire resistant lab coat(such as Nomex), Safety glasses, Chemical resistant gloves, e.g. nitrile gloves

**Working with corrosive liquids with a ph < 2 or > 12.5**

*Room:* MS: ENGI - 399A

*Hazard:* Large surface area skin or eye damage, poisoning

*Engineering Controls:* Work with material on a bench top in a laboratory with adequate air exchanges or inside a certified fume hood lined with absorbent material.

*Administrative Controls:* Purchase pre-diluted acids. Use solutions buffered as close to neutral as the protocol will allow.

*PPE:* Safety goggles and face shield, Chemical resistant apron, Corrosion-resistant gloves

**Lab works with a chemical(s) that have an OSHA specific standards.**

*Room:* MS: ENGI - 399A

*Hazard:* Various acute and systemic effects

*Engineering Controls:* Work with material inside a certified fume hood

*Administrative Controls:* Contact EH&S for Risk Assessment; Follow OSHA specific standard by contacting EH&S for assistance in developing and following lab specific SOP.

*PPE:* Fire resistant lab coat(such as Nomex), Safety glasses, Additional PPE to be determined after Risk Assessment and in consultation with EH&S, Chemical resistant gloves, e.g. nitrile gloves
Safety and Emergency Equipment Identified

The appropriate use of PPE is critical in reducing exposure to laboratory hazards and represents the last line of defense against potential exposure. Please visit the EH&S Personal Protective Equipment (PPE) webpage to review the Columbia University PPE Policy and for more detailed information on the use and selection of PPE at http://ehs.columbia.edu/ppe.html

Morningside - Engineering Terrace - Room: 399A

[PPE] Chemical resistant apron
[PPE] Safety glasses
[Safety & Emergency Equipment] Bio-Safety Cabinet
[Safety & Emergency Equipment] Emergency Shower in Corridor
[Safety & Emergency Equipment] Eye Wash Station
[Safety & Emergency Equipment] Fire Extinguisher
[Safety & Emergency Equipment] Fume Hood
[Spill Clean-Up Kits] Acids Clean-Up Kit
[Spill Clean-Up Kits] Alkalis Clean-Up Kit
**Laboratory Assessment Tool**

**Assessment Date:** 11/06/2015  
**Principal Investigator:** Kam, Lance

**Training**

Every member of the University community engaged in laboratory operations is obligated to participate in the University's safety training program. This obligation may be established by a regulatory agency, a condition of a grant, a University policy, a departmental requirement or as a combination of two or more of these mandates. Regardless of how your training requirements are established, safety training is an essential component of the University's research safety program.

Below is the training profile for laboratory personnel based on the hazards associated with your laboratory and the tasks performed by laboratory staff members. Please ensure that all training requirements are completed.

<table>
<thead>
<tr>
<th>Alex Dang</th>
<th>Last Completed</th>
<th>Status</th>
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<tbody>
<tr>
<td>Biological Safety/Bloodborne Pathogen Training - TC0509</td>
<td>07/22/2015</td>
<td>Current</td>
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<tr>
<td>Shop Safety Training - TC0600</td>
<td>02/28/2015</td>
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<td>Lab Safety, Chemical Hygiene, and Hazardous Waste Management - TC0950</td>
<td>06/22/2015</td>
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<td>Carleton Laboratory Site-Specific Training - TC2600</td>
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<td>C-14 Certificate Issue Date</td>
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<td>Laser Safety Training - TC1600</td>
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<td>Safe Use of Formaldehyde Training - TC0016</td>
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<td>Shipping with Dry Ice, Exempt Specimens and Excepted Quantities of Dangerous Goods - TC0076</td>
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Shipping Biological (infectious and potentially infectious) Materials and Genetically Modified Microorganisms (GMMOs) - TC0507 02/16/2015 Current
Recombinant DNA Training - TC0508 08/09/2014 Current
Biological Safety/Bloodborne Pathogen Training - TC0509 07/20/2015 Current
Lab Safety, Chemical Hygiene, and Hazardous Waste Management - TC0950 07/08/2014 Current

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<th>Lester Lambert</th>
<th>Training</th>
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Biological Safety/Bloodborne Pathogen Training - TC0509 | 09/18/2015 | Current
Lab Safety, Chemical Hygiene, and Hazardous Waste Management - TC0950 | 09/18/2015 | Current

**Shuqing Zhao**

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Chemical Inventory

An inventory of the chemicals in the laboratory is a requirement of the LATCH. This list should be updated regularly as new chemicals are introduced and removed from the laboratory. Please follow the instructions for your campus below.

Medical Center: Please submit a chemical inventory by using the spreadsheet provided here. It is the laboratory's responsibility to update the inventory regularly.

Lamont: Your laboratory's chemical inventory is managed and maintained through the Safety Office and can be accessed here. No further action is required.

Morningside: Your laboratory's chemical inventory is managed and maintained through ChemTracker and can be accessed here. No further action is required.

Nevis: Please submit a chemical inventory by using the spreadsheet provided here. It is the laboratory's responsibility to update the inventory regularly.

Barnard: Please contact Dan Davis at ddavis@barnard.edu or 212-854-6939 for further information and instructions.

NYSPI: Please submit a chemical inventory by using the spreadsheet provided here. It is the laboratory's responsibility to update the inventory regularly.
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Safety Data Sheets

The Occupational Safety and Health Administration’s (OSHA) Hazard Communication Standard (29 CFR 1910.1200) requires employers, including Columbia University, to make safety and health information for hazardous chemicals available to their employees. Columbia University subscribes to a web-based service for providing this information. The service, ChemWatch, makes finding Safety Data Sheets (SDS) quick and easy, and can be accessed [here](#).
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Waste Management

Columbia University is committed to protecting human health and the environment through a proactive Waste Management and Recycling Program. This commitment is realized through EH&S’s collaborations with the University’s schools, departments, research laboratory community and Facilities Management. Through these partnerships EH&S is able to help the University maintain compliance with all applicable regulations, promote best management practices and contribute to the goal of environmental protection. EH&S training programs coupled with the 5Ls of Hazardous Waste Management and the University’s No Drain Disposal Policy provide the essential foundation to properly manage hazardous waste.