# Laboratory Safety Plan (LSP) Toolkit

The Laboratory Safety Plan (LSP) is a supplement to the [UMN Chemical Hygiene Plan](https://dehs.umn.edu/chemical-hygiene-plan). It is a template for research laboratories at UMN to state their lab-specific safety policies, procedures, and documentation. This web toolkit will give you specific guidance as to the content required in an LSP and will give you resources to help you complete those sections.

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# Administrative

## Lab Safety Contacts

Laboratory safety contacts should be identified and their contact information (i.e. name, phone number, e-mail address, etc.) should be kept on file in your LSP.

List important lab safety contacts here.

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| **PI** | Name:  Phone Number:  E-mail: |
| **Lab Safety Officer (LSO)** | Name:  Phone Number:  E-mail: |
| **Department Safety Officer (DSO)**  **[Link to DSO Master List]** | Name:  Phone Number:  E-mail: |
| **UHS Research Safety Partner**  **[Link to RSP Contact page]** | Name:  Phone Number:  E-mail: |

Resources:

[UHS Lab and Research Safety page](https://dehs.umn.edu/environmental-health-safety-dehs/lab-research-safety)

[Role-Based Safety Guidance (Roles and Responsibilities)](https://dehs.umn.edu/role-based-safety-guidance)

[Department Safety Officer (DSO) Master List](https://dehs.umn.edu/master-dso-list)

## Laboratory Working Hours and Working Alone Policy

The [UMN Chemical Hygiene Plan](https://dehs.umn.edu/chemical-hygiene-plan) states that researchers should limit work after hours (i.e. nights and weekends) to non-hazardous activities such as data analysis and report writing. If hazardous materials or equipment must be used during non-working hours or when the user is alone, training must be provided and documented by their PI as part of their lab-specific training. Any work alone or after-hours requires the PI’s approval. Persons under 18 years of age are not allowed to work alone at any time.

Document your labs rules for afterhours work and lab-specific procedure to obtain PI approval for working after-hours or working alone.

Resource: [Working Alone Fact Sheet](https://dehs.umn.edu/node/129441/attachment)

## Personal Protective Equipment (PPE) Requirements

All UMN workers are required to wear long pants/skirts and closed toe/heel shoes while in an area where hazardous materials are stored and used. Some laboratories require additional PPE depending on the hazards and the work conducted there.

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| Document any lab-specific PPE requirements here. |

Resource: [PPE Selection Guide](https://dehs.umn.edu/sites/dehs.umn.edu/files/ppe_-_1_page_selection_guide_10_13_2015.pdf)

## Door Signage

The required UMN comprehensive lab sign provides emergency responders, Facilities Management staff, and visitors with information regarding potential laboratory hazards, required precautions for entry, and contact information. It fulfills several hazard posting requirements and makes hazard communication at the University of Minnesota more standardized and recognizable.

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| Document your lab-specific hazards here by listing examples of the chemical hazard classes, radioactive, biosafety risk level of the work in your lab that triggers the signage threshold (see the CHP link below for threshold levels).  Hazard classes in use in this lab include:   * Chemical Example 1 * Radiation * Biological Risk Level   Customize your door sign accordingly and update your sign as your lab contacts or lab hazards change. |

Resource: [Signage Requirements – UMN CHP](https://dehs.umn.edu/23-signage)

## Hazard Communication and Labeling

All chemicals in the laboratory are required to have a label that indicates chemical contents and hazard warnings. Labs are responsible for labeling chemicals that are transferred from manufacturer containers into a secondary container or chemicals that are synthesized in the lab.

Exemptions: Chemicals that will be used within one work shift and will not be unattended during the work period of their intended use.

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| Document your lab-specific hazard communication method here. |

Resources:

[Non-Manufacturer Container Labeling Fact Sheet](https://dehs.umn.edu/node/129271/attachment)

[Sample Chemical Abbreviation Key](https://dehs.umn.edu/node/129551/attachment)

Hazard Class Labels

[Unattended Operations](https://dehs.umn.edu/node/129431/attachment)

## Chemical Inventory

All laboratories at UMN are required to keep an inventory of their hazardous chemicals and reconcile it annually.

UHS in the process of implementing the chemical inventory module in [Chematix](https://www.dehs-tools.umn.edu/Chematix/), our safety management software. Labs will be contacted by their Research Safety Partner and Department Safety Officer when it is their turn to transfer their chemical inventory into Chematix. If you have questions about this process, contact your Research Safety Partner directly.

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| Document any inventory-specific information here. For example, is your inventory kept solely in Chematix, or is it in another system (i.e. Quartzy, Google Sheets, etc.)? |

# Hazard Assessments

Hazard assessments are important and must be performed on procedures that are new to the laboratory or have not been studied previously. The level of formality and what you need to document will depend on the process being examined.

Use the following resources to perform hazard assessments for your laboratory procedures. Your Research Safety Partner can help you with this process. All hazard assessment forms should be documented here in your LSP.

## Resources:

[ACS “Identifying and Evaluating Hazards in Research Laboratories” Document](http://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/publications/identifying-and-evaluating-hazards-in-research-laboratories.pdf)

[Hazard Assessment in Research Laboratories](https://www.acs.org/content/acs/en/about/governance/committees/chemicalsafety/hazard-assessment.html)

Prudent Practices in the Laboratory, Chapter 4 [Evaluating Hazards and Assessing Risks in the Laboratory](https://www.nap.edu/read/12654/chapter/5)

Laboratory Safety for Chemistry Students by Hill Finster, Wiley 2010

[UMN Chemical Hygiene Plan – Experiment](https://dehs.umn.edu/5-experiment-planning-and-sops) Planning and SOPs

# Standard Operating Procedures (SOPs)

An SOP is a documented set of instructions, used to standardize a method and communicate hazards for a specific procedure, process, chemical class, chemical or piece of equipment. Below are specific examples of where SOPs may be required. Attach or link your lab-specific SOPs here in your LSP.

## Chemical Classes

Commonly used chemical hazard classes are often treated in a similar manner, and a Hazard Class SOP is sufficient to document the safe use and handling of the entire class. University Health and Safety have created hazard class SOP templates with general recommendations of safe use and storage of several hazard classes of chemicals. As always, customize the SOP to fit your own lab-specific limitations.

Examples: flammables, oxidizers, reactives, corrosives, compressed gases, toxics

## Individual Chemicals

Certain high-hazard chemicals may require their own SOP, especially if special working procedures are required or if the hazard posed by the chemical requires special emergency treatment upon exposure.

Examples: hydrofluoric acid, osmium tetroxide

## Equipment

Some laboratory equipment may require the use of an SOP for safe and proper use. Consider SOPs for equipment that involve high hazard operations (i.e. high/low temperature, high/low pressure, etc.)

Examples: UV lights, rotary evaporators, glove boxes, anaerobic chambers, lasers

## Chemical Process or Procedures

Common lab chemical processes or procedures may require an SOP depending on the hazard level and the desire for reproducibility. For hazardous lab processes, an SOP should document the finding of a hazard assessment of the process.

Examples: acid digestion, acid or base cleaning baths, hydrogenation reactions

## Resources:

[Hazard Class SOP Templates](http://z.umn.edu/hazardclass)

[Animal Work (IACUC) Resource Folder](http://www.z.umn.edu/IACUCresources)

# Emergency Procedures

## Lab Emergency Preparedness Plan

The lab [Emergency Preparedness Plan](https://dehs.umn.edu/node/129246/attachment) (EPP) provides lab occupants with room-specific instructions on what to do in case of emergency. An EPP is required to be customized based on your lab location and policies and posted near lab exits.

## Lab Emergencies and Chemical Spills

Review UHS guidance regarding [Emergency Procedures and Chemical Spills](https://dehs.umn.edu/emergencies-and-chemical-spills) for examples of where a researcher must call 911 or where a researcher can call the non-emergency number for assistance. For non-emergencies, your lab must decide what you are capable of handling. A good example would be a small spill in the lab where the chemical is not highly toxic or reactive and the spill is easily contained.

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| Define your lab-specific limitations for handling non-emergency incidents here. |

## Incident/Near Miss Reporting Expectations

Please review the UMN Injury or Illness reporting requirements on the [UHS Occupational Health – Injury or Illness](https://bohd.umn.edu/injury-or-illness) webpage. An investigation of an incident or near miss should take place as soon after the incident or near miss is recognized. Inclusion of the Department Safety Officer and your Research Safety Partner is recommended.

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| Document your lab-specific policies on incident and near miss reporting here. |

Resource: [UMN Chemical Hygiene Plan – Emergency Procedures](https://dehs.umn.edu/8-emergency-procedures-0)

# Training

## UHS Required Training

University Health and Safety required training is dependent on the hazards that you are working with. The UHS Training Locator and your UHS Research Safety Partner can help you determine these requirements.

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| Determine your training requirements based on your laboratory hazards and document employee requirements here. Be sure to indicate if the requirement is a one-time requirement or an annual requirement. |

Resources:

[UHS Training Locator](http://www.dehs.umn.edu/training_locator.htm)

[Training Requirements Fact Sheet](https://dehs.umn.edu/node/130366/attachment)

## Lab-Specific Training

It is the responsibility of each PI/Lab Manager to:

* Identify workplace hazards (chemical, physical, and biological)
* Identify affected employees
* Provide employee access to appropriate hazard information (i.e., Safety Data Sheets (SDSs), Standard Operating Procedures (SOPs), etc.)
* Provide training regarding the specific hazards present in an employee's laboratory work area, including methods to control such hazards
* Keep training records for five years (see [Documentation](https://dehs.umn.edu/42-documentation))

Training must include required procedures and personal protective equipment to reduce the risk of exposure. Training must be provided at the time of an employee's initial work assignment, prior to assignments involving new potential exposure situations and **annually** thereafter. In the case that only one employee is working in the lab, that employee must review lab-specific training material annually and document that it has been done.

Resources:

[Lab-Specific Training Fact Sheet](https://dehs.umn.edu/node/130361/attachment)

[Lab-Specific Training Document](https://dehs.umn.edu/node/129236/attachment)

# Other Documentation

Below is a description of other records that you may be required to keep on file, including the duration of time they need to be kept (if applicable). You are not required to keep the documentation in your LSP, but the records must be readily accessible by all lab staff.

[Eyewash Fact Sheet](https://dehs.umn.edu/node/129291/attachment) (records must be kept for one year)

[Autoclave Testing Log](https://bohd.umn.edu/autoclaves) (records must be displayed in the autoclave room or available upon request during inspection)

[Lab-Specific Training](https://dehs.umn.edu/node/130361/attachment) (documentation must be kept for 5 years)

[Lab Self Inspection Form](https://dehs.umn.edu/node/129196/attachment) (documentation is optional)

[Lab Inspection Records](https://www.dehs-tools.umn.edu/Chematix/) – Found in the Chematix System (documentation is optional)

# References and Resources

[UMN Chemical Hygiene Plan](https://dehs.umn.edu/chemical-hygiene-plan)

[UMN Chemical Hygiene Plan References](https://dehs.umn.edu/104-references)

[UHS Document Library](https://dehs.umn.edu/document-library)

[Prudent Practices](http://www.nap.edu/catalog.php?record_id=12654)

[Waste Disposal Procedures](https://dehs.umn.edu/hazardous-waste-disposal-procedures)