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| GUIDELINE | **Writing a Standard Operating Procedure (SOP) Guideline** |

A standard operating procedure is a set of step-by-step instructions compiled by a Principal Investigator (PI) to help laboratory workers carry out routine operations. SOPs aim to achieve efficiency, quality output, and uniformity of performance, while reducing miscommunication and failure to comply with industry regulations. Each SOP incorporates safety and health considerations that must be followed when laboratory work is performed. A well-written SOP provides detailed instructions that any individual with general subject knowledge can comprehend and use to repeatedly complete a procedure safely and effectively.

As the Principal Investigator, it is your responsibility to ensure that all individuals conducting this protocol are taught the correct procedures for safe handling of the hazardous materials involved. It is also your responsibility to ensure that your personnel complete Laboratory Safety Training and other applicable safety training courses.

* Prior to conducting any work, the PI or designee must provide training to his/her laboratory personnel regarding the specific hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and a copy of the SDS provided by the manufacturer.

The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last year.

When developing an SOP, the following information should be included:

* The type, quantity, and nature of the hazard in use.
  + Note that when using chemicals, fully review the Safety Data Sheet (SDS), as well as health and safety information provided by Laboratory Safety and agencies such as NIOSH and OSHA. These resources provide important information regarding potential hazards that will need to be considered, such as toxicity, flammability, reactivity, warning properties, and symptoms of exposure.
* Location of us, including fume hood or other containment devices. Include specifically designated work area for "particularly hazardous substances."
* Under Section #2 of this SOP Template:
  + Describe all necessary process details required to complete the procedure from the beginning to the end.
  + Provide specific details for the operation of any machinery or equipment that will be utilized in the procedure.
* Required safety equipment, including personal protective equipment.
* Waste collection, storage, and disposal requirements.
* Decontamination procedures for both personnel and workspaces.
* Circumstances requiring prior approval from the PI/Laboratory Supervisor must be addressed in laboratory-specific SOPs. These circumstances are based on the inherent hazards of the material being used, the hazards associated with the experimental process, the experience level of the worker, and the scale of the experiment. Some examples of circumstances that may require prior approval include working alone in a laboratory, unattended or overnight operations, the use of highly toxic gas of any amount, the use of large quantities of toxic or corrosive gases, the use of extremely reactive chemicals (e.g., pyrophorics, water reactive chemicals), or the use of carcinogens.

Documentation of each SOP developed is required to be uploaded into BioRAFT under the Documents Tab. SOPs must be available to all laboratory personnel. All laboratory personnel using a specified process must be trained on the relevant SOP and the training must be documented. Training can be documented by completing the signature page at the end of each SOP.

**Rowan University Laboratory Standard Operating Procedure (SOP) Template:**

**[Title]**

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| **Department:** | Click here to enter text. | **Date:** | Click here to enter text. |
| **Principal Investigator/Supervisor:** | Click here to enter text. | **Office Phone#:** | Click here to enter text. |
| **Procedure Author:** | Click here to enter text. | **Lab Phone#:** | Click here to enter text. |
| **Location(s) covered by this SOP/Building/Room#:** | Click here to enter text. | **Author Email:** | Click here to enter text. |

*Review any applicable manufacturer/vendor safety information, such as a Safety Data Sheet (SDS), before developing the Standard Operating Procedure (SOP).*

***Any deviation from this SOP requires approval from the PI.***

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| **#1 Brief Experimental Summary:** *Provide a general description of the process and/or experimental procedure.* | | |
| Click here to enter text. | | |
| List the chemicals that fall under this SOP, include CAS#, and GHS symbols and categories: | | |
| Chemical (CAS#) | GHS categories | GHS symbols – *choose the appropriate symbols for each chemical* |
| Click here to enter text.(Click here to enter text.) | Choose an item. | Click here to enter text.   |  |  |  | | --- | --- | --- | | Health Hazard | Flame | Exclamation Mark | | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/health-hazard-jpg.jpg | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/flame-jpg.jpg | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/exclamation-mark-jpg.jpg | | Gas Cylinder | Corrosion | Exploding Bomb | | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/gas-cylinder-jpg.jpg | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/corrosion-jpg.jpg | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/exploding-bomb-jpg.jpg | | Flame Over Circle | Environment | Skull and Crossbones | | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/flame-over-circle.jpg | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/environment-jpg.jpg | http://www.sigmaaldrich.com/content/dam/sigma-aldrich/customer-service/ghs/skull-jpg.jpg | |

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| ***#2 Procedure Description:*** *Provide a comprehensive list of all steps required for the procedure; from preparation to waste disposal, along with decontamination/clean-up steps. For each step’s description, include any step-specific hazard, personal protective equipment, engineering controls, designated work areas, and specific working alone restrictions in the left-hand columns. Note the location and use of any emergency response equipment specific to process (e.g., Calgonate gel, Class D fire extinguisher, inert absorbent material).* | | |
| **Working Alone:** Working alone is not recommended. Notify your coworkers prior to conducting this work and ensure that at a minimum of 1 person is nearby and aware that the work is occurring.  **Scale:** Work on as small a scale as possible. Do not exceed volumes/masses of Click here to enter text. Choose an item., without prior consultation with and approval by the PI. | | |
| Procedure Steps | Work Location / Safety Equipment | Precautions |
| Click here to enter text. | Click here to enter text. | Click here to enter text. |
| **Chemical Equation Graphic (optional):** | | |
| Click here to enter text. | | |

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| **#3 Personal Protective Equipment (PPE):** List the personal protective equipment used during this process. | | | |
| ***Note:*** PPE is to be worn by those conducting the work and any other personnel within the work area or laboratory. | | | |
| **Eye Protection:** ANSI-approved properly fitting safety glasses or goggles. Chemical splash goggles and/or full-face shield during activities which pose a splash hazard.  **Body Protection:** An appropriately sized lab coat must be worn and buttoned. Laboratory coat sleeves must be of sufficient length to prevent direct skin exposure while wearing gloves. 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.  Check box for specialty lab coat: Nomex/Flame Resistant Biological Barrier Other Click here to enter text. | | | |
| **Hand Protection:** Wear chemical-resistant gloves; remove gloves and wash hands with soap and water after use. Double gloves may provide additional protection for some chemicals. Consult the [Chemical Safety](https://sites.rowan.edu/facilities/Departments/Operations/EHS/lab-safety/chemical-safety.html) page of the Laboratory Safety website for glove selection resources. If prolonged contact or immersion is anticipated, consult with EH&S to identify appropriate protective gloves. | | | |
| **Additional Protection:** | Face Shield | Chemical-Proof Apron | Respiratory Protection |
|  | Additional Gloves Click here to enter text. | | Other Click here to enter text. |

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| **#4 Incompatible Conditions and Materials:** *List the incompatible conditions, chemicals, and/or materials that should be avoided, along with the safe storage conditions.* | | |
| Click here to enter text. | | |
| Material: | Incompatibility: | Storage Conditions: |
| Click here to enter text. | Click here to enter text. | Click here to enter text. |

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| **#5 Training:** *Training required for all personnel conducting this procedure. Include any specific training requirements.* |
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| * Complete EH&S online “General Laboratory Training” in [CITI](https://research.rowan.edu/officeofresearch/compliance/cititraining/). * Review and sign Lab-Specific Training with PI, Lab Safety Representative, or other designated person. * Review SOP with knowledgeable person. * Complete training on specialized equipment prior to use (e.g., ultracentrifuge, hydrogenation apparatus). * Other EHS training requirements (e.g., Biosafety, Radiation Safety, Hazardous Waste Management). * Click here to enter text. |

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| **#6 Clean-Up, Spill, and Emergency Response Procedures** (reference the SDS as needed): *Provide any specific information.* |
| Decontamination/Clean-Up: Wash bench and/or work area with soap and water after using.  Specific Spill Clean-Up Procedures: Choose an item. Click here to enter text. |
| Do not attempt to clean up any spill or release for which you are not fully trained and equipped. For assistance with spill cleanup, dial **911** and EHS at 856-256-5105.   * Isolate the area to prevent the spread of contamination (e.g. close doors to affected area, post warning signs, alert others in immediately vicinity to evacuate). * Prevent spill from reaching drains or from spilling outside of the fume hood if possible. Do this without exposing yourself to liquid or vapor. * Clean the affected area and all exposed equipment with soap and water to remove any contaminants before resuming work. * Spill clean-up materials should be disposed of as hazardous waste. |
| Laboratory Emergency Response Equipment: *All research personnel must know location of nearest fire alarm pull station and emergency shower/eyewash. Do not use fire extinguisher unless you are trained to do so. List locations for nearest fire alarm pull and emergency shower/eyewash.*  Click here to enter text. |
| Emergency Shutdown Procedures: Click here to enter text. |

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| **#7 Hazardous Waste(s):** *List expected concentrations and amounts of hazardous waste(s) generated during this process. Provide any special/specific waste management. Contact EHS for specific guidance regarding hazardous waste handling and disposal. General hazardous waste management guidelines can be found on the Rowan University Laboratory Safety site under* [*Laboratory Waste*](https://sites.rowan.edu/facilities/Departments/Operations/EHS/lab-safety/laboratory-waste.html)*.* |
| Click here to enter text. |
| **Waste Labeling**   * Affix a [Rowan University Waste Label](https://sites.rowan.edu/facilities/Departments/Operations/EHS/lab-safety/laboratory-waste.html) as soon as the first drop of waste is added to the container.   **Waste Storage**   * Store hazardous waste in closed containers with venting cap, in clean secondary containment, segregated by hazard class, in a marked and designated waste accumulation area. * Double-bag dry waste using transparent bags. * Waste accumulation area must be under the control of the person generating the waste and be located near the point of generation.   **Waste Disposal**   * When full, Hazardous Waste must be removed from the Satellite Accumulation Area (SAA) within 3 calendar days. * Containers must be correctly labeled, clean, sealed, and safe to transport. * Submit a [Waste Pickup Request](https://sites.rowan.edu/facilities/Departments/Operations/EHS/lab-safety/laboratory-waste.html) as soon as the waste container is full.   **Contact EHS at 856-256-5105 or** [**labsafety@rowan.edu**](mailto:labsafety@rowan.edu) **with any questions.** |

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| **#8 First Aid / Emergency Procedures:** *Describe immediate First Aid or medical treatment required in case of personnel exposure.* |
| Click here to enter text. |
| For immediate medical assistance, dial **911**. Report all serious injuries to EHS as soon as possible.   * If inhaled, move into fresh air immediately. * In the case of eye or skin contact, flush with water for a minimum of 15 minutes. Ensure that eyelids are held open while rinsing eyes. * If ingested, flush mouth with water (only if the person is conscious). * In the case of a needlestick/puncture injury, wash the affected area with soap and warm water for 15 minutes. * Seek medical attention immediately. * Complete [incident report form](https://sites.rowan.edu/rmi/). |

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| ***I have reviewed and approve this Standard Operating Procedure.*** | | |
| PI Name | PI Signature | Date |

**Chemical Information Summary**

***Provide information for all chemicals included in the SOP. See the SDS for detailed toxicity information. Add more lines as needed.***

**Physical & Chemical Properties**

| Chemical | CAS# | Molecular Formula | Structure | Molecular Weight (g/mol) | Density (g/mL) | Form (physical state) | Melting Point (ºC) | Boiling point (ºC) | Flash point (ºC) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Click here to enter text. | Click here to enter text. |  |  |  |  |  |  |  |  |
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**Exposure Limits/Toxicity Data**

| Chemical | Color | Odor | Cal/OSHA PEL | Toxicity LD50 |
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| Click here to enter text. |  |  |  |  |
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**Documentation of Training for [Title]**

*(Signature of all users is required)*

**I have read and understand the content of this SOP:**

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| **Name** | **Signature** | **Date** |
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