**Wayne State University**

**Office of Environmental Health and Safety (OEHS)**

**Standard Operating Procedure (SOP)**

**1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP)**

Enter Lab Specific SOP Title Here

**** **** ****

***Note –Text in gray italics indicate instructions to complete this SOP.***

| **#1 CONTACT INFORMATION** |  |
| --- | --- |
| **SOP Title** | Click or tap here to enter text. |
| **SOP Prepared By** | Click or tap here to enter text. |
| **Date Prepared** | Click or tap here to enter text. |
| **SOP Revised By** | Click or tap here to enter text. |
| **Date Revised** | Click or tap here to enter text. |
| **Responsible Person** | *[Name of PI, Lab Supervisor, or Autonomous Researcher, as appropriate]*Click or tap here to enter text. |
| **Locations** | **This procedure may be performed in the following location(s):**Building name & Room # Building name & Room # Building name & Room # Building name & Room #  |
| **Approval Signature** | *[Obtain prior approval, as appropriate. See section #10 of this template.]*Signature  |
| **Emergency Contact Name(s)** | Click or tap here to enter text. |
| **Emergency Contact Number(s)** | *[Enter at least one 24/7 emergency contact number of a lab member]*Enter contact number(s)  |
|  | **WSU Police: (313) 577-1200** |

| **#2 THIS SOP IS DEVELOPED FOR A:** |
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| ***Administration of 1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) to small rodents.******[Indicate the type of rodent to be used in this procedure]***Enter text. |

| **#3 PROCESS OR EXPERIMENT DESCRIPTION** |
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| *[Provide a brief description of your process or experiment, including its purpose. Do not provide a detailed sequential description as this will be covered by section #6 of this template. Include the frequency and the duration below.]*Click or tap here to enter text. |
| **Frequency** | [ ]  One time[ ]  Daily[ ]  Weekly[ ]  Monthly[ ]  Other: Enter text |
| **Duration per experiment** | *[Minutes/ Hours/ Days, etc.]*Click or tap here to enter text. |

| **#4 HAZARD SUMMARY & SAFETY LITERATURE REVIEW** |
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| 1. MPTP Health Hazards

MPTP (1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine) is a neurotoxin used to induce parkinsonism symptoms in experimental models of Parkinson’s disease (PD). MPTP can produce irreversible neurological damage indistinguishable from PD in humans and animals. The inappropriate handling of MPTP may result in exposure and irreversible neurological damage to research staff. MPTP is lipophilic which freely and rapidly crosses the blood-brain barrier. It is metabolized to 1-methyl-4-phyenyl-2,3-dihydropyridinium (MPDP+) which is oxidized to the active toxic compound 1-methyl-4-phenylpyridinium (MPP+). Excretion of MPTP occurs mainly during first day post injection while MPTP metabolites (MPDP+ and MPP+) are excreted up to 5-days post injection. Excretion is mainly in the urine and feces. MPTP in urine is expected to be ionized and not volatile. Exposure potential is greatest during preparation of MPTP, administration, and in the bedding during the 5-days post injection (prior to the first cage change).**NOTE**: It is known that immediate adverse health effects can result from short term exposure to high amounts of MPTP and its metabolites (acute exposure). Some research suggests it may also occur from repeated long term exposure to low amounts of MPTP and its metabolites (chronic exposure). Therefore, appropriate protection is essential at all stages of this procedure, even when handling minute amounts of MPTP.Acute toxicity – Oral (Category 3); Dermal (Category 3); Inhalation (Category 3)Specific target organ toxicity – single exposure (Category 1), Nervous systemIrritant – Causes skin irritation (Category 2); Causes serious eye irritation (Category 2A); May cause respiratory irritation (Category 3)LD50 oral (mouse) – 150 mg/kgLD50 dermal (mouse) – 300 mg/kgLD50 subcutaneous (mouse) – 54 mg/kgLD50 intraperitoneal (rat) – 72 mg/kg1. Other Hazards Associated with the Process or Experiment

[List nonchemical hazards, e.g., biological hazards, electrical hazards, mechanical hazards, nonionizing radiation, or ionizing radiation.]Enter text. If not applicable, enter “N/A”.1. References

*[List all references you are using for the safe and effective design of your process or experiment, including safety literature and peer-reviewed journal articles. Safety resources are available from* [*OEHS website*](https://research.wayne.edu/oehs)*.]* Enter text. If not applicable, enter “N/A”.  |

| **#5 STORAGE REQUIREMENTS** |
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| Store MPTP containers in a sealed shatter-proof, leak-proof, secure secondary container, ideally a lockbox tethered to the cupboard/drawer/freezer where stored. Only personnel who have been trained in the safe use of the toxin will have access to the storage container. The secondary container must be labeled with toxin name, hazard warnings, and contact information of trained, responsible laboratory staff.*[Provide the supplier name and product number of the MPTP that will be purchased. Describe lab specific special handling and storage requirements for MPTP.]*Click or tap here to enter text. |

| **#6 STEP-BY-STEP OPERATING PROCEDURE** |
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| [*Include any personal protective equipment, engineering controls, and designated work areas in the left hand column in the table below.*1. ***Guidance on Personal Protective Equipment(PPE) - To assist with your PPE selection, refer to*** [OEHS website](http://research.wayne.edu/oehs/)***. Respiratory protection is generally not required for lab research, provided the appropriate engineering controls are employed. For additional guidance on respiratory protection, consult with OEHS, 313-577-1200.***
2. ***Guidance on Engineering and Ventilation Controls – Review safety literature and peer-reviewed journal articles to determine appropriate engineering and ventilation controls for your process or experiment. Guidance is available from OEHS (313-577-1200) and online from*** [OEHS website](http://research.wayne.edu/oehs/)***.***
3. ***De*signated work area(s)** – These areas are intended to limit and minimize possible sources of exposure to highly hazardous materials [e.g. – highly flammable, highly reactive (e.g. water reactive/pyrophoric), toxic (e.g. acute toxins, reproductive toxins, mutagens), biohazards, radioactive materials]. The entire laboratory, a portion of the laboratory, or a laboratory fume hood or bench may be considered a designated work area

Describe the possible risks involved with failure to follow a step in the SOP in the right hand column.] |

| **Step-by-Step Description of Your Process or Experiment** | **Potential Risks if Step is Not Done or Done Incorrectly (if any)** |
| --- | --- |
| 1. Don personal protective Equipment

[x]  Appropriate street clothing (long pants/skirt, closed toed shoes)[ ]  Gloves. Type & thickness: Enter text.[ ]  Safety glasses[ ]  Safety goggles[ ]  Face shield[ ]  Standard Lab coat – Type: Enter text.[ ]  Flame-resistant lab coat – Type: Enter text.[ ]  Disposable gown[ ]  Chemical resistant apron – Type: Enter text.[ ]  Air purifying respirator (e.g. N95, cartridge respirator, etc.) Type: Enter text.*[Requires fit testing and adherence to* [*WSU Respiratory Protection Program*](https://research.wayne.edu/oehs/health-safety/respirators)*]*[ ]  Other: List all other required PPE. Enter text.*Describe if specific activities require additional or specific PPE.* Click or tap here to enter text. | Enter text. |
| 1. Check the location/accessibility/certification of the safety equipment that serves your lab:
 |  |
| **ITEM AND STATUS** |  |
| [ ]  Chemical Fume Hood – Location & certification date: Enter text.[ ]  Biological Safety Cabinet – Location & certification date: Enter text.[ ]  Glove Box – Location: Enter text.[ ]  Other – Description & location: Enter text. | Enter text. |
| Eyewash – Location: Enter text.Safety Shower – Location & certification date: Enter text. | Enter text. |
| First Aid Kit – Location: Enter text. | Enter text. |
| Chemical Spill Kit – Type & location: *[The chemicals being used may require a specific, commercially available chemical spill kit (e.g. hydrofluoric acid neutralizing spill kit). If this is a lab-assembled, basic chemical spill kit, please describe contents.]*Kit description | Enter text. |
| Fire Extinguisher – Type & location: Enter text. | Enter text. |
| Fire Alarm Manual Pull Station – Location: Enter text. | Enter text. |
| Telephone – Location: Enter text. | Enter text. |
| 1. Designated work area(s) - Enter text.
 | Enter text. |
| 1. Procedure – *[Describe the steps in the procedure. Add steps as required. Note which steps are of highest risk for personnel exposure. If MPTP will be transported to a different room, building floor, or different building, describe the safety controls to be used for safe transport. Note where MPTP will be transported to.]*

Step 1: Step 2: Step 3:  | Enter text. |
| 1. Dispose of hazardous solvents, solutions, mixtures, and reaction residues as hazardous chemical waste.
 | Enter text. |
| 1. Clean up /decontamination work area and lab equipment. *[Describe specific cleanup procedures for work areas and lab equipment that must be performed after completion of your process or experiment. For carcinogens and reproductive toxins, designated areas must be immediately wiped down following each use.]*

Enter text. | Enter text. |
| 1. Remove PPE in the following order:
* Outer gloves
* Disposable gown
* Safety glasses (or face shield then goggles)
* N95 respirator (dispose of as hazardous chemical waste)
* Lab coat
* Inner gloves
* Wash hands with soap and water
 | Enter text. |

| **#7 MEDICAL CONSULTATION, EMERGENCY PROCEDURES, AND SPILL RESPONSE** |
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| **Medical Consultation**Prior to initiating work with MPTP, OEHS recommends the PI and any lab personnel working with MPTP complete a neurological examination and medical consultation with a WSU approved Occupational Health Physician regarding exposure risks and treatment options in the event of an exposure. Exposure risks and treatment options can be affected by complicating factors such as personal health history, work history, lifestyle, and exposure to environmental contaminants. Contact the OEHS Occupational Health Nurse (7-1200) to receive a referral to a WSU approved medical provider for evaluation.**Emergency Procedures****\*\*If medical attention required, call WSU police (313-577-2222) immediately\*\**** **Eyewash and Safety Shower** – An eyewash station and safety shower must be easily accessed, and available within 10 seconds travel time (~55 ft.) for emergency use. Instruct personnel on the locations of eyewashes and safety showers, and how to activate them, prior to an emergency. **NOTE**: The eyewash must be flushed on a weekly basis and documented using the [Emergency Eyewash Maintenance Log](https://research.wayne.edu/oehs/docs/eyewash-log-sheet.doc), which must be posted near the eyewash.
* **Sink** – A sink for handwashing must be available and accessible within the room(s) where MPTP work will be performed.
1. **Injuries and Exposures**

In case of an injury or exposure, a secondary person should be available to secure the MPTP and the area and to contact emergency personnel. Bring copies of the Safety Data Sheet for MPTP and this SOP to the occupational health clinic or hospital. After receiving treatment for injuries and exposures, call OEHS (313) 577-1200, to report the exposure. Complete the [Report of Injury](https://risk.wayne.edu/files/rofi.pdf) form and submit to WSU Enterprise Risk Management.First aid measures for MPTP exposure.* 1. **Needlestick or sharps injury involving MPTP.**
		1. Halt all work and immediately wash the wound with soap and water for at least 15 minutes.
		2. Call WSU Police (313) 577-2222.
	2. **Eye contact or dermal exposure.**
		1. Remove any contaminated clothing.
		2. Flush with copious amounts of water for at least 15 minutes using an eyewash/safety shower.
		3. Call WSU Police (313) 577-2222.
	3. **For oral (mouth) exposure or if MPTP has been swallowed and if the person is conscious.**
		1. Wash out mouth with water for at least 5 minutes.
		2. Call WSU Police (313) 577-2222.
	4. **For inhalation exposure.**
		1. Move the exposed individual from the area to fresh air.
		2. If breathing becomes difficult call WSU Police (313) 577-2222.
1. **Authorized Occupational Health Clinic and Emergency Rooms for Exposure Response**

For injuries and exposures that are not considered serious or a medical emergency, visit:Henry Ford Occupational Health – Harbortown3300 East Jefferson, Suite 100Detroit MI 48207(313) 656-1618Monday – Friday 8:00 AM to 6:30 PMIf Henry Ford Occupational Health Center is closed or for serious injuries, visit:Henry Ford Hospital – Emergency Room2799 W. Grand Blvd.Detroit MI 48202(313) 916-8742ORDetroit Receiving Hospital - Emergency Room4201 St. Antoine St, Detroit, MI 48201Phone: (313) 745-30001. **Lab Specific Emergency Procedures**

*[This section is for any emergency procedures different from standard responses, or for additional emergency information due to the nature of materials or task. Include information on gas leaks, chemical spills, and personal exposure/medical emergency as appropriate.]*Enter text. If not applicable, enter “N/A”.1. **Building Maintenance Emergencies**

For building maintenance emergencies (e.g. power outages, plumbing leaks, roof leaks, etc.) immediately call:* Between 7:00 AM - 4:00 PM Monday – Friday, Facilities Operations and Maintenance at 313-577-4315
* After business hours, Public Safety at 313-577-2222
1. **Local Notifications**

*[Identify the area management staff that must be contacted and include their work and after-hours numbers. This must include the principal investigator and may include the lab safety coordinator, facilities manager, and/or business manager.]*Enter text.**Spill procedures**All spills should be reported to the Principal Investigator. For any spills involving broken glass or sharps, use forceps to remove any broken glass or other sharp items and place in a sharps container.1. **Powder or Liquid Spills Outside of CFH**

For spills or releases that have impacted the environment (via the storm drain, soil, or air outside the building); or that cannot be cleaned up by local personnel due to size of spill or location of spill; or a powder spill outside of a CFH.* 1. Evacuate the spill area of all personnel.
	2. Remove any contaminated PPE and place in a plastic bag for disposal.
	3. Call WSU Police (313) 577-2222. Available 24 hours a day, 7 days a week.
	4. Post someone or mark-off the hazardous area with tape and warning signs to keep other people from entering.
	5. Remain in the vicinity until emergency personnel arrive and provide them with information on the chemicals involved.
1. **Powder or Liquid Spills Inside of CFH**

To be cleaned by properly protected and trained personnel.* 1. Alert personnel in the immediate area of spill and restrict access.
	2. Remove any contaminated PPE or clothing. Don fresh PPE.
	3. Personnel cleaning spill must be wearing a lab coat, disposable gown, safety glasses/goggles, two pairs of nitrile gloves, and N95 respirator.
	4. Dampen absorbent material with **freshly prepared 1% sodium hypochlorite** and gently place over the spill, to avoid raising dust.
	5. Apply to absorbent material **freshly prepared 1% sodium hypochlorite**, starting at the perimeter and working towards the center, **allowing 10-minute contact time to deactivate MPTP**.
	6. Collect spill cleanup materials using a scoop or other suitable tools and place in a tightly closed hazardous waste container.
	7. Clean the spill area with **freshly prepared 1% sodium hypochlorite** **allowing 10-minute contact time**, then soap and water.
	8. Allow CFH to run for at least 10 minutes before resuming work.
	9. Place all contaminated materials, including contaminated items such as gloves, in the hazardous chemical waste container.
	10. Wash hands thoroughly after completing any spill cleanup.
	11. Label waste container with completed hazardous waste tag (available from OEHS).
	12. Submit online [waste pickup request](https://research.wayne.edu/oehs/hazardous/chemical-waste.php) to OEHS.
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| **#8 WASTE DISPOSAL** |
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| [Describe the quantities of waste you anticipate generating and appropriate waste disposal procedures. Include any special handling or storage requirements for your waste].Enter text.Do not dispose waste by dumping down a drain or discarding in regular trash containers, unless authorized by OEHS. Contact OEHS at 313-577-1200 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also, refer to the [OEHS Hazardous Waste Management web page](http://research.wayne.edu/oehs/hazardous/index.php) and [WSU Chemical Hygiene Plan](https://research.wayne.edu/oehs/pdf/chemical-hygiene-plan.pdf) for more information. |

| **#9 TRAINING REQUIREMENTS** |
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| **General Training** *(check all that apply)*: The courses listed below can be taken online through the [Collaborative Institutional Training Initiative (CITI) at the University of Miami](https://about.citiprogram.org/).[ ]  Laboratory Safety Training (general lab and chemical safety issues)[ ]  Hazard Communication[ ]  Shipping Biological Substances & Dry Ice Refresher TrainingInformation about [Shipping Dangerous Goods](https://research.wayne.edu/oehs/shipping).The trainings below are linked to specific training slides or documents.[ ]  [Laboratory-Specific Safety Training (](http://research.wayne.edu/oehs/docs/lab-safety-training-checklist.doc)link to Word Doc checklist)[ ]  [Controlled Substance Training](http://research.wayne.edu/oehs/training/lab.php#CS)[ ]  [Radiation Safety Training](https://research.wayne.edu/oehs/training/radiation) |
| **Laboratory Specific Training** *(check all that apply)*:[ ]  Review of SDS for chemicals involved in process/experiment[ ]  Review of this SOP[ ]  Other: Enter text. |
| **Location Where Training Records Are Maintained:** Enter text. |

| **#10 PRIOR APPROVALS AND CERTIFICATIONS** |
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| Notes: You **must** seek prior approval from your principal investigator (PI) or lab supervisor if you plan to use **restricted chemicals** (e.g. dimethyl mercury, hydrofluoric acid and toxic gasses).You should also consult your PI or lab supervisor if your experiments involve **high-risk chemicals and operations,** as special safety precautions may need to be taken. High-risk chemicals and operations may involve chemicals with a high level of acute toxicity, carcinogens, reproductive toxins, and highly reactive materials.[ ]  Prior approval from the PI or lab supervisor is required for this procedureComplete the following table confirming that all lab personnel using this SOP read and understand the above SOP and is agreed to contact PI if planned to modify this SOP.*[The table below should be completed after WSU Chemical Safety Committee approval.]* |

| **NAME** | **ACCESS ID #** | **SIGNATURE** | **DATE** |
| --- | --- | --- | --- |
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