FIU | FLORIDA INTERNATIONAL UNIVERSITY

SOP #: 705.01

Title: SOP - Safe Work Practices for the use of MPTP in the Laboratory and Vivarium

Approvals:

Attending Veterinarian _____ **Date:** 11/29/2018

1. Purpose

1.1 This procedure establishes procedures for safe handling, transport and storage of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine, commonly known as MPTP (CAS # 28289-54-5). MPTP is known to produce severe irreversible brain damage similar to advanced Parkinson's disease. The inappropriate handling of MPTP may result in neurological damage to researchers; therefore, its handling, storage and use must follow a strict safety protocol.

1.2 This SOP addresses the use of MPTP in the laboratory and in the Vivarium. It assumes that minimum safety requirements are in place. This SOP covers:

1.2.1 Pure MPTP or any solution of MPTP, regardless of concentration.

1.2.2 Any excretions from test animals that would reasonably be expected to contain traces of MPTP and/or its metabolites.

2. Responsibility

2.1 All staff engaged in the use or handling of MPTP, or working within a laboratory using MPTP, is responsible for understanding all hazards associated with its use, and for using appropriate personal protective equipment (PPE).

2.2 The Principal Investigator is responsible for ensuring that his/her staff has been trained in the use, storage and handling of MPTP.

2.3 MPTP use is restricted to the specific staff member who has appropriate training in proper use, handling and storage. Each staff member's name must appear on the listing in Section 7 of this document, and each staff member must initial by his/her name.

3. Definitions

3.1 ACF - Animal Care Facility

3.2 MPTP: 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine, (CAS # 28289-54-5). MPTP is known to produce severe irreversible brain damage similar to advanced Parkinson's disease.

3.3 PI – Principal Investigators

4. Guidelines

4.1 Training

4.1.1 Prior to conducting any work with MPTP, the Principal Investigator must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.

4.1.2 The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and a copy of the MPTP MSDS (see attachment to this SOP).

4.1.3 The Principal Investigator must ensure that his/her laboratory personnel have attended initial laboratory safety training or refresher laboratory safety training within the last two years.

4.2 Signage

4.2.1 When MPTP is in use, warning signs must be posted on the laboratory door, and the chemical hood until the MPTP has been returned to storage and the work area has been decontaminated.

4.2.2 A sign must be posted on animal room door/s and on animal cages that contain animals dosed with MPTP.

4.2.3 Signs will include the information shown in the following samples:

CAUTION

NEUROTOXICANT IN USE

MPTP (1-METHYL-4-PHENYL-1,2,3,6-TETRAHYDROPYRIDINE)

Authorized Personnel Only

For more information, please contact:_____

Material Safety Data Sheets are in room:_____

CAUTION

NEUROTOXICANT IN USE
MPTP (1-METHYL-4-PHENYL-1,2,3,6-TETRAHYDROPYRIDINE)

DO NOT TOUCH THIS CAGE

For more information, please contact:_____

4.3 Storage

4.3.1 Pure MPTP and concentrated solutions must be stored in a location that is secure to unauthorized access. Examples are a locked drawer or cabinet or a laboratory door that is locked when authorized personnel are not present.

4.3.2 Store solutions in appropriate, sealed containers with unbreakable secondary containment (i.e., a bottle or vial within a sealed plastic jar). Label all containers, including secondary containment, with the chemical name and hazard warning.

4.3.3 An inventory of pure MPTP will be kept, noting amounts ordered stock on hand and amounts discarded or used.

4.4 Handling and Solution Preparation

4.4.1 Prepare the smallest amount of solution necessary for the procedure.

4.4.2 Opening of pure MPTP, preparation and administration of solutions will take place in a chemical hood that has been certified within the last 12 months. Just before use, the operation of the chemical hood must be verified by the use of an installed chemical hood monitoring device, a smoke test using a smoke generating tube, or a mechanical or electronic device that indicates air flow. During use, the sash must be lowered to operating height.

4.4.3 Use disposable labware whenever possible. Reusable labware must be decontaminated before reuse. Disposable labware should be decontaminated with a bleach solution (see section 4.4.10 for preparation) before discarding in a medical waste container.

4.4.4 After injection, do not clip, remove, or recap the needle. Instead, place used syringes directly into a sharps container that has been previously placed in the chemical hood. Check the injection site for leaking material and absorb with dampened gauze. Contaminated gauze must be placed in a container for disposal as hazardous waste.

4.4.5 The following minimum personal protective equipment must be worn during operations with pure MPTP and its solutions:

4.4.5.1 Safety glasses with sideshields or safety goggles,

4.4.5.2 Disposable nitrile gloves (NOT latex). Change gloves frequently and when contaminated, punctured or torn. Wash hands immediately after removing gloves.

4.4.5.3 A disposable laboratory coat, jumpsuit or other appropriate protective clothing that is removed after working with MPTP and discarded.

4.4.5.4 The use of a NIOSH-approved N-95 disposable respirator is optional when working with pure MPTP or concentrated solutions. Contact REHS for guidance on respirator use, selection, fit-testing and training.

4.4.5.5 The chemical hood work surface must be lined with a disposable plastic-backed paper liner. The liner must be changed after work is completed for the day, at shift change, and/or after a spill.

4.4.5.6 Weighing should take place in the chemical hood. If the chemical hood produces vibration that prevents accurate weighing, an alternate method is to tare a closed vessel on a balance outside the hood, add the MPTP in the hood, and reweigh the closed vessel outside the hood. Adding of solvent and any additional dilutions must take place in the chemical hood.

4.4.5.7 Immediately after work with MPTP, decontaminate all work surfaces and equipment with a 5% dilution of household bleach (e.g., 5 mL of Clorox® or equivalent containing 6% sodium hypochlorite, added to 95 mL water). The chemical hood MUST be decontaminated before any other work is performed in it.

4.4.5.8 Remaining solutions of MPTP and any dry waste (paper towels, gloves) must be disposed of as hazardous chemical waste through REHS.

4.4.5.9 Wash hands thoroughly immediately after working with any concentration of MPTP.

4.5 Animal Handling and Housing

4.5.1 General Procedures

4.5.1.1 Animal cages containing treated animals must be labeled in accordance with the sample label shown in 4.2.3.

4.5.1.2 All potentially contaminated non-metal surfaces must be decontaminated with a 5% bleach solution (see 4.4.5.7). Metal surfaces must be washed with a strong detergent solution. Paper towels or rags used for cleaning must be placed in a Regulated Medical Waste container.

4.5.2 Cage Changing

4.5.2.1 Do not change animal bedding for at least 72 hours after administration of MPTP.

4.5.2.2 Cage changing will be performed only by appropriately trained staff.

4.5.2.3 Wet the bedding with a 5% bleach solution.

4.5.2.4 Place the bedding into a red medical waste bag, tie it and place it into a medical waste container.

4.6 EMERGENCIES

4.6.1 Spill of MPTP:

4.6.1.1 Isolate the area to prevent the spread of contamination (e.g., close doors to affected area and post a warning sign.

4.6.1.2 Alert personnel in the immediate area to evacuate.

4.6.1.3 Attend to any injured personnel.

4.6.1.4 Spills may be decontaminated with an excess of 5% to 10% bleach solution (see 3.5.9 for preparation instructions). Notify REHS of the spill and the cleanup procedure.

4.6.1.5 If the spill is large or you are unsure of your ability to thoroughly decontaminate it, call the Public Safety Emergency number and ask EHS to respond.

4.6.2 Accidental Exposure to MPTP

4.6.2.1 In the event of a recognized percutaneous or mucous membrane exposure to MPTP:

4.6.2.2 Remove contaminated clothing.

4.6.2.3 Rinse the affected area with water, using a safety shower or eyewash, as appropriate, for a minimum of 15-minutes. A disposable laboratory coat or jumpsuit should be available for the victim to wear after using a safety shower.

4.6.2.4 Notify the victim's supervisor, if immediately available. The supervisor, a co-worker, or the victim must contact the campus Employee/Occupational Health Program to determine what additional steps should be taken.

4.6.2.5 If the incident occurs off-hours, or an ambulance is needed because of injury, contact Public Safety to advise them of the medical emergency

4.6.2.6 In the event of a suspected or incidental exposure to MPTP:

4.6.2.6.1 Immediately rinse the affected area using a safety shower or eyewash for a minimum of 15 minutes.

4.6.2.6.2 Notify the supervisor if immediately available. The supervisor, a co-worker, or the victim must contact Employee/Occupational Health to determine what additional steps should be taken.

4.6.2.6.3 If the incident occurs off-hours, or an ambulance is needed because of injury, contact Public to advise them of the medical emergency.

4.7 SIGNATURES

4.8 Principal Investigators: Use the following table to list all personnel who will handle MPTP. The staff member's initials indicate that the staff member has read this SOP and understands the l hazards and safe work practices as detailed in this therein.

Name	Job Title	Lab Staff Initials*

Principal /Responsible Investigator: (Print): _____

Principal /Responsible Investigator (Signature):_____

Date: _____

4.9 REFERENCES

4.9.1 University of Medicine and Dentistry of New Jersey: EHS SOP - Safe Work Practices for the use of MPTP in the Laboratory and Vivarium. Revision 01/11/2007

4.9.2 Langston, J. W., et al., Chronic Parkinsonism in Humans Due to a Product of Meperidine-analog Synthesis. Science 219, 979-980 (1983). Posted at: http://opioids.com/mptp/mepanalog.html

4.9.3 Sigma-Aldrich MSDS database, Product M1021, 1-Methyl-4-phenyl-1,2,3,6-tetrahydropyridine MSDS

4.9.4 "Working With MPTP or MPTP-Treated Animals," NIH Division of Safety, Office of Research Services. Posted at: http://www2.umdnj.edu/eohssweb/aiha/technical/animal.htm Dec. 1, 2003, 35407 bytes

4.9.5 Recommended safe practices for using the neurotoxin MPTP in animal experiments. Yang S. C., Markey S. P., Bankiewicz K. S., London W. T. and Lunn G. (1988) Lab. Anim. Sci. 38, 563–567. Posted at: http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=retrieve&db=pubmed&list_uids=3264039&dopt=Abstract

4.9.6 The parkinsonian toxin 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP): a technical review of its utility and safety , Journal of Neurochemistry, Vol. 76, No. 5, 2001 1265-1274

4.9.7 MPTP treatment in mice does not transmit and cause Parkinsonian neurotoxicity in non-treated cagemates through close contact. Yang, Y.S., Novikova, L., Roels, C. Neurosci. Res. 52: 371-8, 2005.