**Tricaine methanesulfonate (MS-222)**

*Standard Operating Procedure* Rev Date: 12/09/2021

This standard operating procedure (SOP) outlines *required methods to be used by researchers during this outlined experiment or process. These practices and procedures are intended to provide a safe working environment, promote a culture of forward-thinking risk mitigation, and to promote compliance with federal, state, and local regulations.*

**APPLICABILITY**

This SOP is for processes, experiments, or manipulations that pose moderate risks and that call for protective steps beyond those dictated by accepted laboratory standards. They are intended to limit the potential for injury, equipment damage, or environmental impact. **Fill in all highlighted areas with appropriate information.**

This SOP is not applicable to….

**RESPONSIBILITIES** (Add to list as appropriate)

PI/Supervisor:

* Implement the guidance outlined in this document within departmental/institute operations.
* Provide training to laboratory personnel regarding the specific hazards involved in working with MS-222 to include work area decontamination, and emergency procedures prior to conducting any work.
* Provide laboratory personnel with a copy of this SOP and a copy of the SDS provided by the manufacturer.
* Ensure that laboratory personnel have completed appropriate laboratory safety training and/or refresher training as required.
* Ensure all personnel are trained on the proper use/operation of any equipment used during the experiment or process.
* Require the use of proper lab attire (lab coats, gloves and eye protection).

Researchers (Graduate Students/Postdocs/Research Staff)

* Implement and follow minimum working protection found in this document.
* Complete appropriate laboratory safety training.
* Wear appropriate personal protective equipment that includes but may not be limited to a lab coat, gloves and eye protection in the laboratory
* Report all near misses, incidents, and unsafe acts or conditions to their principal investigator and [Environmental Health & Safety](https://utdirect.utexas.edu/apps/campus/safety/incident/nlogon/?_ga=2.230545435.683263765.1638826606-1985937015.1617305987).

Undergraduate Students

* Follow minimum working protection found in this document.
* Complete appropriate laboratory safety training.
* Wear appropriate personal protective equipment that includes but may not be limited to a lab coat, gloves and eye protection in the laboratory.

**PROCEDURE**

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| **Fill in all highlighted areas with appropriate information.****INSERT TITLE OF EXPERIMENT OR PROCESS**  |
| This is where you can type out a description of the experiment or process you will perform. Just give an overall view. You will be walking through the experiment or process step by step below.  |
| **Preparer:** Insert Name | **Location:** AAA 000.0 |
| **Authorized Personnel with Contact Information** |
| **Position** | **Name** | **Number/Email** |
| Principle Investigator/Supervisor | Insert Name | 555-5555 |
| Student/Technician/Operator | Insert Name | 555-5555 |
| Others to be notified (e.g., other workers in the same laboratory, or other members of the research group) | Insert Name | 555-5555 |
| **Potential Hazards** |
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| **Planned Chemicals Involved** | **Hazards** |
| Tricaine methanesulfonate, TMS, or MS-222 (CAS# 886-86-2) | 1. Irritant, corrosive to eyes, skin, and respiratory tract.
2. Muscle relaxant – blocks action potentials and neurological signals between the extremities and the brain.
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| **Planned Equipment Involved** | **Hazards** |
| Insert equipment name | List relevant hazards for equipment. (Examples in attachment 1) |
| **Hazard Controls** |
| **Engineering** | **Work Practice** |
| * Fume hood (chemical work)
* Enclosed balance
* Appropriate waste containers
* Bench paper, pads, plastic-backed paper
* Additional Engineering controls (e.g. glovebox, special ventilation, guards, temperature control etc.)
 | * Double glove
* Designated areas for work
* Procedures for requesting emergency assistance (including after-hours)
* Emergency phone numbers
* Locations of fire alarms, fire extinguishers, fire blankets, eye washes, showers, etc.
* Training on all experimental techniques and experiments
* Housekeeping
* Additional work practices (e.g. Preventive maintenance, mask, etc.)

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| **Required PPE** |
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| **Experiment Operational Ranges and Conditions** |
| **Pressure:** | Insert info | **Temperature:** | Insert info | **Volume:** | Insert info |
| **Physical State:** | Insert info | **Odor:** | Insert info |
| **Flammability Range:** | Insert info | **Other:** | Insert info |
| **Volatility:** | Insert info |
| **Routes of Exposure:** | Insert info |
| **Special Handling & Storage Requirements** |
| * Keep containers of Tricaine Methanesulfonate (MS-222) tightly closed and stored in a well-ventilated place.
* The expiration date of the chemical will be routinely checked. Any amount of the chemical remaining beyond the expiration date will not be used on the animals and will be properly tagged and submitted to EHS for disposal. MS-222 is light sensitive and may form toxic by-products upon exposure to light.
* Avoid inhalation, and contact of dust or liquid with eyes, skin, and clothing. Avoid repeated or prolonged exposure.
* Label all containers containing MS-222.
* All areas used in weighing the dry material, preparing the solution, and euthanizing the fishes will be thoroughly cleaned with soap and water as needed. All cleaning materials will be properly disposed of immediately following use.
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| **Spill & Incident Procedure**  |
| **Spills or Releases:** For **large spills**, immediately restrict other personnel from entering the area. Contact appropriate lab personnel for assistance with clean up. For **smaller spills**, use the procedure outlined below.**Dry material:** Use appropriate PPE. Avoid raising dust, do not sweep up or vacuum dry material. Use wet paper towels or larger cloths supplied in laboratory spill kits (Insert location). Place spent materials in an appropriate waste container for EHS disposal. **Solution:** Use appropriate PPE. Use absorbent pads supplied in laboratory spill kits (Insert location). Place spent materials in an appropriate waste container for EHS disposal.**Fire:** In the event of a fire, laboratory personnel should follow standard procedures as outlined by FPS training courses.**Signs and Symptoms of Exposure:** Skin, eye, or respiratory irritation.**Exposures:** Inhalation: Allow personnel to rest in a well-ventilated area. Seek medical attention. Eye contact: Check for and remove any contact lenses. Rinse eye for at least 15 minutes at an appropriate eye wash station (Insert location). Seek medical attention. Skin contact: Remove contaminated clothing as quickly as possible and bag clothing for appropriate disposal. Thoroughly wash skin with running water and mild soap. If irritation persists, seek medical attention. |
| **Waste Handling & Disposal** |
| Most spent, unused, and expired chemicals/materials are considered hazardous wastes, they must be properly disposed of. **Do not dispose of chemical wastes by pouring them down a sink or drain, or discarding in the regular trash containers. Contact HMM at** EHS-HazardousMaterials@austin.utexas.edu **or call 512-471-3511**. Euthanized animals will be disposed of according to EHS recommendations. Contact EHS-HMM at (512) 471-3511 for waste supplies and for any questions regarding proper waste disposal. Also, refer to the EHS [Hazardous Waste](https://ehs.utexas.edu/environment-waste/waste-management) Web page for more information. |

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| **Training Requirements**  |
| * Complete EHS online Laboratory Safety training available through UT Learn. (<https://ehs.utexas.edu/training/lab-training-requirements>).
* Review SOP with knowledgeable person.
* Complete training on operation of specialized equipment prior to use (e.g., ultracentrifuge, hydrogenation apparatus).
* Other training requirements (e.g., Biosafety, Radiation Safety, Hazardous Waste Management) as appropriate.
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|  **PROCEDURE** |
| **Step** | **Directions** |
| **Process/Use** | Before injecting/working with xxxxx, you must be trained by xxxxx. |
| 1 | Insert procedural steps for experiment or process. Add to table as needed. |
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| **Use in Animals** | Work should be conducted in xxxxx facility in a BSC and all animal carcasses are picked up and disposal is handled through EHS. xxxxx is administered to xxxx in via xxx. Before injecting/working with xxxx, you must be trained by xxxxx.  |
| 1 | Insert procedural steps for experiment or process. Add to table as needed. |
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| **Notes** |  |
| **VERIFICATION & REVIEW** |
| **Current Date** | **Date of SOP Expiration** |
| 00/00/0000 | 00/00/0000 |
| **PI Name** | **PI Signature** |
| Insert Name |  |
| **Safety Reviewer Name** | **Safety Reviewer Signature** |
| Insert Name |  |
| **LIST OF REFERENCES** |
| Include Safety Data Sheets, Globally Harmonized System, any outside personnel consulted in preparation of document, peer reviewers, etc. |

# SOP Training Certification

I have read and understand the above SOP. I have taken all appropriate EHS training. I have received prior approval from my supervisor to perform this procedure. I agree to contact my supervisor if I plan to modify this procedure.

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| Principal Investigator | Revision Date |

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| **PROCEDURE MODIFICATIONS/REVISIONS** |
| **Current Date** | **Modifications or Revisions** | **Name** |
| 00/00/0000 | Insert summary of changes made | Insert name of person making and/or approving changes |
| 12/9/2021 | Original document | Suzanne Kilpatrick |
| 12/9/2021 | Updates to responsibility, waste, training requirements sections and addition of SOP training certification section.  | Rudy Guerrero, Andrea McNair (Reviewers: Suzanne Kilpatrick) |