Wake Forest Baptist Health	**Standard Operating Procedure (SOP) Template**	

DIMETHYL SULFOXIDE (DMSO)

Effective Date:	**1/18/2012**	**Revised Date:**	**1/31/2012**

INTRODUCTION

A Standard Operating Procedure (SOP) describes how your lab will handle a hazardous chemical safely, including the amount and concentration you will use, how you obtain or create the working solution, and special handling procedures, engineering controls, and personal protective equipment. Chemical-specific SOPs are found on the EH&S website.

Wake Forest Baptist Medical Center has created Standard Operating Procedures (SOPs) for several chemical hazard categories and some commonly-used chemicals. The SOP provides only standard information and requires customization for each lab.

The Occupational Safety and Health Administration (OSHA) requires a written SOP for any work with hazardous chemicals in laboratories. There are additional requirements for SOPs for particularly hazardous substances, or PHSs. These SOPs are an important part of the Chemical Hygiene Plan.

GENERAL LAB RULES

1. No eating, drinking, smoking, handling contact lenses, or applying cosmetics in the laboratory.
2. Persons shall wear buttoned lab coat, long pants, safety glasses or goggles and appropriate gloves when working with hazardous chemicals.
3. Mouth pipetting is prohibited; mechanical pipetting devices are to be used at all times.
4. All procedures are performed carefully to minimize the creation of splashes or aerosols.
5. Wash hands
    - after handling chemicals materials,
    - after removing gloves, and
    - before leaving the laboratory.
6. Plastic ware should be substituted for glassware whenever possible

Add Lab Specific Rules Here

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PURPOSE

Add Lab Specific Purpose Here

PHYSICAL HAZARDS

- Colorless, essentially odorless liquid.
- Flash point is 192ºF.
- Incompatibilities and Reactivities: organic and inorganic acid chlorides, strong oxidizing agents, alkali metals, hydrobromic acid, and acidic solutions of alkali bromides; prolonged heating above 150ºC can cause rapid decomposition.
- Freezes (solidifies) at 18ºC (64ºF).

HEALTH HAZARDS

- DIMETHYL SULFOXIDE has shown very few toxic symptoms in humans.
- The most common are nausea, skin rashes and an unusual garlic-onion-oyster smell on body and breath.
- High vapor concentrations may cause headache, dizziness, and sedation.
- Stinging and burning of the skin as well as rashes and vesicles have been seen. A heat reaction may occur if applied to wet skin.
- Avoid contact with DIMETHYL SULFOXIDE solutions containing toxic material or materials whose toxicological properties are not known.
- DIMETHYL SULFOXIDE easily penetrates the skin, but because of DIMETHYL SULFOXIDE's low toxicity and the fact that DIMETHYL SULFOXIDE does not carry less-permeable substances with it through the skin, it can be concluded that DIMETHYL SULFOXIDE does not pose a significant threat by skin absorption.

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PERSONAL PROTECTIVE EQUIPMENT

EYE PROTECTION

- Safety glasses, goggles or face shields shall be worn during operations in which DIMETHYL SULFOXIDE (DMSO) might contact the eyes (e.g., through vapors or splashes of solution).
- Ordinary (street) prescription glasses do not provide adequate protection. Adequate safety glasses must meet the requirements of the Practice for Occupational Education Eye and Face Protection (ANSI Z87.1-1989) and must be equipped with side shields.
- Wearing contact lenses under some circumstances provides workers with a greater choice of eye and face protection (such as goggles or full-facepiece respirators without prescription inserts) as well as better visual acuity. However, the risk is unknown for contact lens wearers compared with nonwearers working with chemicals listed in the NIOSH Pocket Guide to Chemical Hazards [NIOSH 2004]. OSHA recommends against contact lens use when working with acrylonitrile, methylene chloride, 1,2 dibromo-3-chloropropane, ethylene oxide, and methylene dianiline." NIOSH Publication No. 2005-139: Current Intelligence Bulletin 59, Contact Lens Use in a Chemical Environment.

HAND PROTECTION

- Use disposable nitrile gloves when working with chemicals. Nitrile gloves are *not* recommended for use with DMSO if extended contact with the hands is expected. Some brands of nitrile gloves have degradation times of five minutes when used with DMSO. DMSO freely penetrates the skin and may carry dissolved chemicals with it into the body, so hand protection is especially important if you are working with any hazardous materials dissolved in DMSO. Change gloves regularly if working with DMSO for an extended period of time.
- Laboratory personnel should thoroughly wash hands with soap and water before and immediately upon removal of gloves.
- Nitrile gloves are *not* recommended for use with DMSO if extended contact with the hands is expected. Some brands of nitrile gloves have degradation times of five minutes when used with DMSO. DMSO freely penetrates the skin and may carry dissolved chemicals with it into the body, so hand protection is especially important if you are working with any hazardous materials dissolved in DMSO.

LAB COATS, ETC.

- Button lab coats, closed toed shoes, long pants and long sleeved clothing shall be worn when handling DIMETHYL SULFOXIDE (DMSO). Protective clothing shall be worn to prevent any possibility of skin contact with DIMETHYL SULFOXIDE (DMSO).

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SAFETY SHOWER/EYEWASH

- Where the eyes or body of any person may be exposed to DIMETHYL SULFOXIDE, suitable facilities for quick drench or flushing of the eyes and body must be provided within the work area for immediate emergency use.
- Bottle type eyewash stations are not acceptable.

DESIGNATED AREA FOR USE AND CONTAINMENT DEVICES

- It is recommended that all DIMETHYL SULFOXIDE (DMSO) work be conducted in the laboratory fume hood. When working with volatile, toxic chemicals, in limited amounts, Biological Safety Cabinets (BSC) Class II, Type A2 exhausted or Class II, Types B1and B2 BSCs exhausted to the outside can be used.
- The fume hood's sash must be in the position where a face velocity of 100 feet per minute is achieved. The BSC must be certified annually by a qualified outside vendor.
- Environmental Health and Safety certifies fume hoods annually and places a yellow sticker to indicate the date of certification and the proper sash height for achieving proper fume hood face velocity.
- Contact Engineering (716-4351) immediately if fume hood is malfunctioning.

SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

- Store in a cool dry place.
- Keep away from heat and open flame.
- Keep tightly closed.
- Store away from heat and light.
- Distill with caution.
- Keep container tightly closed, in a well-ventilated place.

Add Lab Specific Special Handling/Storage Procedures

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EMPLOYEE EXPOSURE MONITORING

- Users of chemical are required to notify EH&S at 716-9375 so air sampling/monitoring may be performed to determine exposure level.
- Individuals planning a family or pregnant can contact EH&S for exposure determination, consultation, and recommendations.
- Exposure monitoring through EH&S is free of charge.

CHEMICAL USE WITH ANIMALS

Click here to enter text. Please consider other routes of exposure when handling animal (e.g., cage sign and) and animal bedding.

WASTE DISPOSAL

- Chemicals shall not be drain disposed.
- Excess DIMETHYL SULFOXIDE (DMSO) and all waste material containing DIMETHYL SULFOXIDE (DMSO) must be placed in an unbreakable secondary container labeled with the following **"HAZARDOUS WASTE DIMETHYL SULFOXIDE (DMSO)"**.
- Full containers of DIMETHYL SULFOXIDE (DMSO) waste must be disposed of according to the EH&S Hazardous Waste Program.
- A Waste Ticket must be completed and submitted prior to disposing of chemical through EH&S.

EMERGENCY PROCEDURES

Emergency Numbers:

Fire and Medical Emergencies	716-9111 (9 + 911 for Friedberg and PTRP campuses)
Principal Investigator's Emergency Number	Click here to enter text.
Employee Health	716-4801
Hospital Emergency Room	716-9008
Environmental Health and Safety	716-9375

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Laboratory Contact Information:

Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.
Click here to enter text.	Click here to enter text.

FIRST AID

- The nearest safety shower station is located: Insert text here
- The nearest safety eyewash is located: Insert text here

  If chemical exposure occurs, flush exposed area for 15 to 20 minutes using emergency eyewash station and/or safety shower.

- Call 716-9111 and describe the extent of injuries, chemical spilled and the amount.
- Keep people out of the area.
- Report all accidental exposures to Employee Health Services.
- Complete an online injury/illness report if there is an over-exposure to the chemical or if there is an accident involving the chemical.

SPILL AND ACCIDENT PROCEDURES

If the chemical spilled is considered a carcinogen, reproductive toxin or highly toxic chemical, contact 716-9111 and evacuate area immediately, regardless of spill amount. If you are unsure of type of chemical, contact 716-9111. For all other spills use the chart below for spill reporting and response: Chemical Spill Procedures

SPILL QUANTITY	PROPER SPILL RESPONSE
Spill less than 300 mL	**Contact Environmental Health and Safety (716-9375) and clean up spill using spill kit.**
Spill greater than 300 mL	**Do not attempt to clean up spill. Leave the Area and immediately report to WFBMC Security (716-9111).**

CERTIFICATION OF APPLICATION
PLEASE READ
THESE ITEMS AUTOMATICALLY BECOME A PART OF YOUR SOP

1. I understand that it is my responsibility to assure that all personnel working in my laboratory with any of these hazards are fully informed about their specific dangers, proper actions for safe use, steps to take in case of accidents, and are provided with all necessary safety equipment and instructions in its use.
2. I agree to follow the provisions of the Chemical Hygiene Plan.
3. I will ensure that all of my personnel attend Basic Lab Safety Training by EH&S prior to using chemical materials.
4. I agree to permit Representatives of WFSM Environmental Health and Safety to inspect the facilities where this work is being conducted.
5. All chemical waste will be disposed of through EH&S Chemical Waste Program. I understand that **drain disposal is NOT allowed**.
6. Chemical materials will be transported in closed containers.
7. Sharps and/or breakable plastic solid waste items will be placed in approved puncture-resistant container, i.e., a sharps container.
8. As soon as possible, the Chemical Occupational Hygiene Officer will be notified in writing of any proposed changes in locations where chemical materials are stored or used.
9. Additional chemicals or changes in possession limits will be requested in writing from the Chemical Occupational Hygiene Officer.
10. Chemical materials will not be transferred to other Authorized Users without prior approval of the Chemical Occupational Hygiene Officer.
11. Chemical materials will not be shipped anywhere off campus without prior approval of the Chemical Occupational Hygiene Officer.
12. Secure chemicals (including waste) to prevent unauthorized access or removal. In addition, you must control and maintain constant surveillance of chemicals that are not in storage or are in use. This can be achieved by: 1) Locking refrigerators and/or storage cabinets, 2) Locking the laboratory when no one is present, and 3) Challenging unknown persons entering the laboratory.
13. I will notify the Chemical Occupational Hygiene Officer of my intent to leave WFUHS at least **60 days** in advance. I will be responsible for disposing of my chemical materials inventory through EH&S Chemical Waste Program.

First	Last	Signature
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