Institutional Animal Care and Use Committee (IACUC) Standard Operating Procedure

SAFETY PRECAUTIONS FOR CHEMICAL USAGE IN ANIMALS

1. Purpose
This document clarifies the safe usage of chemicals on animal protocols to ensure that hazards have been identified and procedures are in place to mitigate those hazards. Because animal research can involve both a research laboratory and an animal facility, safety precautions and procedures will be reviewed for all relevant locations where a chemical is stored, prepared, and used.

2. Scope
This SOP is applicable to all ISU staff, research investigators, and technicians who use chemicals while doing research with animals. ISU staff, research investigators, and technicians are expected to understand the content of SOPs related to their work responsibilities.

3. General Requirements
All personnel who use chemicals during animal research must follow these procedures.

4. Procedure
A. Standard Operating Procedures
SOP template: [http://www.ehs.iastate.edu/forms/soptemplate.pdf](http://www.ehs.iastate.edu/forms/soptemplate.pdf)

1. A written Standard Operating Procedure (SOP) is required for all chemical preparation and usage on campus. SOPs must be reviewed and approved by the Principal Investigator (PI) and/or Laboratory Manager. For chemicals used on IACUC protocols, personnel listed on the protocol, as well as animal care staff, must be trained on the elements of the SOP before the chemical is prepared or used. This training must be documented.

2. At minimum, the SOP for chemicals used on IACUC protocols must include:
   - Health and safety information for the chemical, including a Safety Data Sheet (SDS)
   - Hazard control measures
   - Waste and animal disposal practices, including:
     o Handling of cages and bedding to decrease chemical contamination
   - Animal handling practices
• Metabolic information about animal elimination of the chemical if applicable
• Decontamination procedures
• Spill/release containment and cleanup procedures

3. If personnel are working with a chemical that will present a significant risk of exposure or injury to the human body, including carcinogens, reproductive toxins, teratogens, or highly toxic substances, the following special procedures must be developed and specified in the SOP:
   • Identify authorized personnel
   • Establish a designated use area
   • Specify special safety precautions

4. More information about SOPs and special procedures for high hazard chemicals can be found in the Laboratory Safety Manual on pages 3 and 4.

B. IACUC Protocol

1. Any chemical that meets the “highly toxic” characteristics outlined in the Hazard Classification for Chemicals Requiring Review section (below) must be listed in the Section IV, Part C: Highly Toxic Chemical section on the IACUC protocol. An SOP for the use of the chemical should be submitted with the IACUC protocol.

C. EH&S Review

1. SOPs will be reviewed by Environmental Health and Safety (EH&S). The review may require submittal of updated SOPs, training records, and other documents to ensure all hazards have been identified and mitigated and training has occurred. Usage or preparation of these chemicals cannot begin until EH&S reviews the SOP.

D. Animal Care Staff Notification

1. The animal care staff in the facility where usage will occur must be provided with a copy of the SOP and other documentation before work begins. Animal care staff must be notified when animals will be exposed to the chemical and when exposure is complete.

E. Hazard Classification for Chemicals Requiring Review

1. The following classification of agents must be listed in the Highly Toxic Chemical section of the IACUC protocol and may be subjected to additional review by EH&S.

2. Characteristics of chemicals that require review are based on hazard classification as defined within the OSHA Hazard Communication Standard 29 CFR 1910.1200.

   a) Acute Toxicity Agents

   (1) Refer to Section 2: Hazards Identification and Section 11: Toxicological Information of the Safety Data Sheet (SDS) to determine if chemicals fall into the categories below.

   (2) Chemical agents are classified as toxic or highly toxic based on the number of deaths that occur following brief (acute) exposure of rodents. The difference in the two categories is strictly the dose level at which toxicity (death) occurs.
(3) Acute Toxicity Chemical Dosage Table

<table>
<thead>
<tr>
<th>Exposure Route</th>
<th>Highly Toxic</th>
<th>Toxic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD$_{50}$</td>
<td>&lt; 50 mg/kg</td>
<td>50–300 mg/kg</td>
</tr>
<tr>
<td>Dermal LD$_{50}$</td>
<td>&lt; 200 mg/kg</td>
<td>200–1000 mg/kg</td>
</tr>
<tr>
<td>Inhalation LC$_{50}$—gas, vapors</td>
<td>&lt; 500 ppm</td>
<td>500–2500 ppm</td>
</tr>
<tr>
<td>Inhalation LC$_{50}$—mists, fumes or dust</td>
<td>0.5 mg/L</td>
<td>0.5–1 mg/L</td>
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</tbody>
</table>

(4) Acute toxicity agents may display the GHS Skull and Crossbones pictogram (GHS06) on the chemical container label and Safety Data Sheet.

**b) Carcinogens, Reproductive Toxins, and Teratogens**

(1) Refer to Section 2: Hazards Identification and Section 11: Toxicological Information of the Safety Data Sheet (SDS) to determine if chemicals fall into this category.

(2) A list of carcinogens, reproductive toxins and teratogens can be found [here](#). This list should not be considered comprehensive. If you have a question about your chemical, contact EH&S at (515) 294-5359.

(3) These chemical agents may display the Health Hazard pictogram (GHS08) on the chemical container label and Safety Data Sheet.
5. Roles and Responsibilities

<table>
<thead>
<tr>
<th>Roles</th>
<th>Responsibilities</th>
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<tbody>
<tr>
<td>Principal Investigator</td>
<td>• Create an SOP for all chemicals used. Include the Safety Data Sheets for the chemicals.</td>
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<td></td>
<td>• Train personnel about the chemicals used and document that training.</td>
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<td></td>
<td>• List highly toxic chemicals used during animal protocols on the IACUC protocol form, Section IV, Part C.</td>
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<td></td>
<td>• Attach SOPs for highly toxic chemical usage when IACUC protocol forms are submitted.</td>
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<tr>
<td></td>
<td>• Train Animal Care personnel about the chemical usage and inform them when animals are exposed and exposure ends.</td>
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<tr>
<td>Animal Care Staff</td>
<td>• Receive training about chemicals being used in animals by personnel in charge of the project.</td>
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<td></td>
<td>• Review SOPs and Safety Data Sheets about the chemicals being used. These will be provided by personnel in charge of the project.</td>
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<tr>
<td>Environmental Health and Safety</td>
<td>• Assist personnel with questions about SOP development.</td>
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<tr>
<td></td>
<td>• Review SOPs of highly toxic chemical usage on animal protocols.</td>
</tr>
</tbody>
</table>

6. Definitions
N/A

7. Health and Safety Information
N/A
8. Appendices

N/A

9. Forms and Templates

SOP template: http://www.ehs.iastate.edu/forms/soptemplate.pdf

10. References

- Carcinogens, Reproductive Toxins and Teratogens
  roTerat.pdf

- Laboratory Safety Manual:

- Occupational Safety and Health Administration Hazard Communication Standard (29

11. Contact Information

  Environmental Health and Safety (EH&S), 515-294-5359, can be contacted for questions
  about this SOP.