

Hazardous Chemicals in Animals Policy

First Issued: 6/15/06, Revised: 5/1/07, 7/18/07, 9/17/09, 5/19/14, 6/4/15, **9/22/17**

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Animal protocols involving hazardous chemicals must be planned and conducted appropriately in order to minimize the potential exposure to research personnel, facility animal care staff, and veterinarians. Hazardous chemicals used in laboratory animals, include known or suspect carcinogens, reproductive toxins or highly toxic substances (e.g. anti-neoplastic agents) and nanomaterials. The very nature of antineoplastic agents make them harmful to healthy cells and tissues as well as cancerous cells, even if they are FDA approved for use in human and/or animals. Animals that have been dosed with a toxic chemical may excrete that chemical or their potential toxic metabolites, particularly for seventy-two (72) hours after the last chemical administration. The following procedures are designed to ensure that individuals are:

- 1) Informed of the potential hazards;
- 2) How to minimize exposure when performing duties associates with protocols using toxic drugs.

As with any laboratory operation, the Principal Investigator (PI) and researchers must identify and understand the hazards associated with the chemical(s) being used (e.g. toxicity, reactivity, flammability, corrosivity, etc.) before they begin their work so that appropriate controls can be established. This information may be available from Safety Data Sheets (SDS) and other sources of safety information. It is important to understand all the hazards of the chemical and any other special considerations that may be required prior to beginning work. Research staff may be exposed to hazardous chemicals during preparation, handling, and animal dosing. These chemicals may be excreted from the animal and, therefore, be present in the animal's bedding in low concentrations. Researchers, animal care staff, and veterinarians may be exposed to these hazardous substances or their metabolites during cage handling or handling of medicated water and/or feed. The Institutional Animal Care and Use (IACUC) protocols must be carefully reviewed by EHSO (Environmental Health and Safety Office) for activities occurring in facilities where animals are housed or used to determine if the proposed chemicals are to be considered hazardous. Additional measures to prevent human exposure and contamination will be implemented for all hazardous chemicals. It is incumbent upon the PI to provide accurate hazard information about the research conducted and chemicals used and to comply with these standard procedures and any procedures specifically developed for their protocols. Failure to do so could results in the non-compliance being reported to the respective Federal agency as well as other negative consequences to the University.

This policy describes required procedures that the PI and the individuals involved with the care of animals must follow for:

- A) Completion of the IACUC Protocol
- B) Coordination with IACUC and EHSO
- C) Hazardous chemical preparation and handling and animal dosing
- D) Cage management and disposal

Principal Investigator's Responsibilities:

1. The PI must provide a list of chemicals and information related to their hazards, e.g. Safety Data Sheets (SDS) and/or literature citation on the prior use of the particular chemicals in animals. This information must be included in the UH IACUC protocol. The information should include but not limited to the following:
 - a. Specific health risks to humans and animals from possible exposure.
 - b. Proposed precautions to be taken to protect people and animals.
 - c. Any information on recommended medical surveillance and/or use of antidotes.
 - d. Information on how the chemical is metabolized in a specific animal species. Animals dosed with hazardous chemicals may excrete that chemical or metabolites, particularly during the first 72 hours after dosing. A review of peer-reviewed literature may provide this information if documented. Otherwise, in the absence of data, conservative measures will be required.
2. The PI shall provide protocol specific training to his/or staff, and the animal care staff prior to start of the project.

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3. Must coordinate the use of the chemical with facility animal care Supervisor or designee prior to start of project (i.e two (2) weeks before beginning dosing project). Coordination includes confirmation of facility availability; room/facility assignment and provisions for appropriate cage labeling and waste management.
4. Must comply with health and safety requirements set forth by this policy, including the development of standard operating procedures (SOPs) when working with specific chemicals. At a minimum, the SOP should describe:
 - a. Use of a chemical fume hood or other appropriate engineering controls.
 - b. Appropriate personal protective equipment (PPE).
 - c. Methods to restrain or sedate animals per IACUC protocol to reduce the possibility of accidental self-inoculation.
 - d. Administration of chemical and methods to minimize risk of accidental exposures (e.g. use of safety syringe).
 - e. Methods to be used to clean-up spills and decontaminate lab surfaces and equipment using wet wiping methods and an appropriate cleaning agent.

Training of staff on SOP (ensure research personnel are trained on the SOPs and specific hazards associated with the chemicals. Maintain training documentation). Include a subject matter expert from EHSO to attend the meeting.

Environmental Health and Safety Office (EHSO) responsibilities:

1. Will review the information provided by the PI to determine if it is a hazardous chemical. If it is hazardous, advise on:
 - a) Specialized personal protective equipment (PPE) in addition to the standard, double nitrile gloves and front closing gown used during chemical administration, animal handling (opening cages), cage changes, waste collection, etc. as described in Work Practices.
 - b) Waste disposal. If the method of disposal includes segregating and collecting the bedding for disposal as hazardous waste, facility animal care Supervisor will work directly with EHSO to determine how the waste will be stored while awaiting disposal by a licensed hazardous waste contractor. If the waste is a mixed waste (e.g. biological and chemical), procedures will be determined in collaboration with the Biosafety Office and EHSO.
2. Will review proposed IACUC protocol and provide their comments/recommendations regarding the protocol to the UH IACUC.
3. Will provide appropriate general training such as Laboratory Safety, hazard communication, etc.

IACUC and Animal Facility Responsibilities:

1. IACUC incorporates EHSO's comments/recommendations into their review and approval process.
2. IACUC ensures that the protocol approval letter informs the PI of special handling and disposal methods of chemically contaminated animal carcasses, cages and bedding, and other associated wastes during the 72-hour period following the last chemical administration.
3. The facility animal care Supervisor or designee will inform PI of any additional costs associated with special husbandry procedures and hazardous disposal of animal carcasses, and/or waste that will be charges back to the PI if the method of disposal exceeds what is covered by the current per diem rate for the species.
4. The facility animal care Supervisor or designee will document and archive all training records for individual protocols involving hazardous chemical dosing in animals.

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Work Practices for Operations with Chemically Dosed Animals:

1. Personal Protective Equipment (PPE) and Use:
 - a. Double, disposable, nitrile glove shall be worn when handling contaminated animals and bedding. Gloves shall be inspected for tears or holes prior to donning, changed frequently, and not reused.
 - b. PPE specific for the hazard is doffed before exiting the room where chemicals in animals are used.
 - c. Individuals shall wash their hands, or use waterless hand soap immediately after removing gloves.
 - d. A closed front, wrap around gown shall be worn when handling contaminated bedding. Gowns are disposed of after each use. Plastic apron, rubber boots or disposable booties may also be needed. The secondary, long-cuffed glove is pulled over the sleeve of the gown.
 - e. A face shield or safety glasses shall be worn when handling contaminated bedding. Individuals wearing contact lenses MUST wear safety glasses. If there is potential hazard from chemical splash, then chemical goggles must be worn in lieu of safety glasses.
 - f. If respirators are recommended and/or required, the appropriate elements of the Respirator Protection Program must be implemented. Contact EHSO for guidance on respirator use.
 - g. Disposable gowns, gloves, respirators and paper towels are disposed of as hazardous waste.

2. Engineering Controls:
 - a. Cages shall be equipped with filtered micro-isolator tops, preferably high efficiency particulate air (HEPA) filters, 0.2 um pore size.
 - b. For all cages opened to manipulate animals and soiled bedding during the treatment period and up to 72 hours after the last administration, is done in a biosafety cabinet (BSC) or fume hood. animal care staff will collect bedding in clear, polypropylene bags and label with agent name and date.
 - c. Decontamination of the BSC or fume hood shall consist of surface cleaning with water and detergent followed by a thorough rinsing with clean water. In some cases, regular vivarium cleaning with clidox 1:18:1, or equivalent, followed by 70% isopropyl alcohol may be sufficient. Cleaning shall proceed from the least to the most contaminated areas.

3. Signage:
 - a. When animals are dosed with a toxic chemical, their cages must be labeled with:
 - i) Name of Principal Investigator
 - ii) Chemical name and chemical hazard warning sign
 - iii) Date and time of chemical administration
 - b. If hazardous chemicals are administered by water/feed, also label the water bottle/feeder with the above information.
 - c. Maintain label on cage, water bottle/feeder for 72 hours after the last dosing AND until contaminated bedding is changed, unless longer time frames are required as identified in the risk assessment.
 - d. The animal care staff are responsible for posting animal SOP signs on rooms housing dosed animals. Signage on door must include the following:
 - . Name of hazardous chemical
 - . PI Name and IACUC Approval number
 - . Entry requirements
 - . Cage changing procedures
 - . Decontamination and spill procedures

4. Disposal:

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- a. Disposal of residual and unused chemicals and solutions as well as animal bedding will be determined by EHSO.
- b. For disposal of sharps, including syringes, refer to:
www.hawaii.edu/ehso/complaine/waste2htm#sharps or for questions, contact Biosafety Office or EHSO.
- c. Disposal of carcasses by animal care staff through alkaline hydrolysis (tissue digester) or equivalent.
- d. Disposal of bedding by animal care staff shall follow one of the below methods as determined by EHSO:
 - i. For all bedding during the treatment period and up to 72 hours after the last administration, animal care staff will collect bedding in clear, polypropylene bags, label with agent name and date, and turn into EHSO for disposal as regulated waste.
 - ii. For all bedding during the treatment period and up to 72 hours after the last administration, animal care staff will collect bedding in clear, polypropylene bags, label with agent name and date, and dispose of in the regular trash.