SOUTHERN ILLINOIS UNIVERSITY CARBONDALE

Institutional Animal Care & Use Committee

IACUC Policy #:	**540**
Policy Title:	***Animal Research Using Carcinogens and Other Hazardous Substances***
Date Approved:	**September 2017**
Date Reviewed:	**March 19, 2025**
Who must know:	**Principal investigators, researchers, and/or personnel with potential exposures to hazardous substances**

Purpose:

The Occupational Safety and Health Administration (OSHA) regulates certain carcinogens, mutagens, and reproductive toxins as particularly hazardous substances under 29 CFR 1910. The regulation requires that personnel with potential exposures to such agents be informed of the hazards of these compounds and protected from exposure risk.

The SIUC Institutional Animal Care and Use Committee (IACUC), in conjunction with the SIUC Center for Environmental Health and Safety (CEHS), has established this standard operating procedure for working with animals exposed to particularly hazardous substances. Such substances can include tamoxifen, cisplatin, paclitaxel, bromodeoxyuridine, flutamide, bicalutamide, and other declared or suspected carcinogens from the authorities as listed below.

A chemical is considered a carcinogen if it is included on any of these lists:

- OSHA-regulated carcinogens as listed in Subpart Z of the OSHA standards.
- The National Toxicology Program (NTP) most recent edition of *The Annual Report of Carcinogens*, in the category *known to be carcinogens*.
- The International Agency for Research on Cancer (IARC) most recent edition of Group 1 chemicals (carcinogenic to humans); Groups 2A and 2B (reasonably anticipated to be carcinogens) that cause significant tumor incidence in experimental animals under specified conditions are also included.

Definitions:

Researchers: in addition to principal investigators and other personnel, the term researcher also includes volunteers and/or students approved to complete research in the designated protocol.

Policy:

1. Laboratory Work

   All laboratory personnel working with carcinogens must receive annual chemical safety training and must receive drug-specific training for handling particularly hazardous substances. Personnel should review the SIU Chemical Hygiene Plan (https://cehs.siu.edu/plans-guide.php) as well as Safety Data Sheets (SDS) and other sources of safety information to understand the chemical and any other special considerations.

   The two greatest risk factors for preparation and administration of carcinogens are usually the generation of aerosols, and unintentional parenteral exposure.

   Personnel mixing solutions of carcinogens, preparing doses, and administering injections must wear appropriate personal protective equipment: a lab coat, safety glasses or goggles, and nitrile gloves. Feet and legs must be completely covered. Activities involving carcinogen preparation must be performed in a chemical fume hood.

   Pregnant women, or women who intend to become pregnant, should not work with particularly hazardous substances.

   Needles used for injection or gavage must be disposed in a sharps container immediately following use.

   Spills of powdered carcinogens, or liquid solutions, should be wiped up and the paper towels placed in a red bag with a biohazard sticker on it. The spill area should be decontaminated with a 20% solution of household bleach (2 parts household bleach:8 parts water), followed by washing the area with soap and water; the contaminated paper towels should also be placed in the red bag. Red bags should be placed in the freezer, and a biowaste pickup request should be filed electronically with CEHS.

   Areas in which carcinogens are prepared or administered should be immediately cleaned with 20% solution of household bleach following each task, with contaminated paper towels disposed as described above.

2. Animal Husbandry
   Cages of animals who have been exposed to carcinogens must be clearly labeled with a sticker indicating the possible presence of a carcinogen. Current literature indicates that many carcinogens and their metabolites can be excreted in feces and in urine, so may be present in soiled animal bedding.

   Personnel changing cages of animals exposed to carcinogens must do so in a vented dump station, collecting the dirty bedding in a red biohazard bag. Personnel cleaning used cages should dump cages with hazardous chemicals contained in the bedding, food and/or water at the ventilated dump station into red biohazard bags. The red bag should then be labeled with a biohazard sticker and put in the Vivarium freezer, for incineration by CEHS. Personnel must wear appropriate personal protective equipment: lab coat, safety glasses or goggles, and nitrile gloves.

   Following euthanasia, animal carcasses which have been exposed to carcinogens must be placed in red biohazard bags, appropriately labeled, put in the freezer, and incinerated by CEHS.

3. Commonly Used Hazardous Substances
   a. **Tamoxifen** is an antiestrogen drug widely used in the treatment of hormone-dependent breast cancer in postmenopausal women and is sometimes used as a prophylactic treatment for women who have a high risk of breast cancer. Certain tamoxifen metabolites are found in plasma after exposure to tamoxifen and may be reasonably expected to be present in animal bedding when the animals have been exposed to tamoxifen.
   b. **Cisplatin** is a platinum-based antineoplastic agent used to treat sarcoma, small cell lung cancer, lymphoma, and other cancers in humans. It is classified as possible carcinogen and mutagen and is associated with cardiac arrhythmias.
   c. **Paclitaxel** is a potent antineoplastic taxane drug, classified as a teratogen, and can cause long-lasting harmful effects to aquatic life.
   d. **Bromodeoxyuridine (BrDU)** is a synthetic thymidine analogue used to identify actively growing cells. It is classified as cytotoxic, mutagenic, and teratogenic.
   e. **Flutamide** is a nonsteroidal antiandrogenic agent used in treating prostate cancer by inhibiting androgen uptake. It is a suspect teratogen.
   f. **Bicalutamide** is an antiandrogenic agent used to treat prostate cancer and is also a suspect teratogen.

g. **Doxorubicin** is an antineoplastic anthracycline drug classified as a suspect carcinogen. When administered to animals, it may be excreted into bedding for up to four days after administration.

References

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