Standard Operating Procedure
Animal Research Conducted with OSHA Particularly Hazardous Substances

Introduction

The Occupational Safety and Health Administration (OSHA) regulates certain carcinogens, mutagens, and reproductive toxins as “particularly hazardous substances.” 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 carcinogens.

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.

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.

Paclitaxel is a potent antineoplastic taxane drug, classified as a teratogen, and can cause long-lasting harmful effects to aquatic life.

Bromodeoxyuridine (BrDU) is a synthetic thymidine analogue used to identify actively growing cells. It is classified as cytotoxic, mutagenetic, and teratogenic.

Flutamide is a nonsteroidal antiandrogenic agent used in treating prostate cancer by inhibiting androgen uptake. It is a suspect teratogen. Bicalutamide is a similar antiandrogenic agent used to treat prostate cancer, and is also a suspect teratogen.

A good reference for particularly hazardous substances sometimes used in animal research can be found at http://iacuc.ou.edu/Drug_registration.asp

The National Institute for Occupational Safety and Health maintains a useful reference for carcinogens and hazardous drugs. It can be found here.

Laboratory Work

All laboratory personnel working with carcinogens must receive annual chemical safety training, and must receive drug-specific training for handling the particularly hazardous substance.
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, 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, 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.

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. 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.
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