

Tamoxifen/4-Hydroxytamoxifen (4-OHT)

OVERVIEW

Hazard Characteristics

- **Carcinogen**
- **Reproductive Toxin**
- **May cause increased impairment in individuals with respiratory conditions**

Background Information Summary

Tamoxifen is a selective estrogen receptor modulator (SERM) used in the treatment of breast cancer. In animal research it is used to trigger issue specific gene expression in genetically modified animals. It is considered a genotoxin and can lead to possible reproductive effects. Individuals who are pregnant, nursing, or trying to become pregnant should avoid exposure to tamoxifen and tamoxifen treated animals.

4-Hydroxytamoxifen (4-OHT) is an active metabolite of tamoxifen and is significantly more potent as an estrogen receptor modulator. For the purpose of laboratory use and use in animal models, exposure reduction, and safety precautions, the procedures and effects described in this fact sheet apply to both.

EXPOSURE AND HAZARD INFORMATION

Exposure Route	Symptoms	Immediate Actions after Exposure
Inhalation	Respiratory irritation. Individuals with impaired respiratory function may incur further disability with excessive inhalation.	• Evacuate area, move to fresh air • Contact poison control and seek medical attention
Oral/Ingestion	Digestive tract irritation, reproductive and fetal effect.	• Rinse mouth, do not induce vomiting • Give 1 or 2 glasses of water • Seek immediate medical attention
Eyes/Mucous Membranes	Eye irritation	• Flush with water for 15 minutes • Remove contact lenses • Seek medical attention
Injection	Entry into the blood stream may produce systemic injury with harmful effects.	• Seek medical attention
Skin	Skin irritation	• Remove contaminated clothing • Wash gently with soap and flush with water for 15 minutes • If symptoms such as redness or irritation develop, seek medical attention

Health Effects

Acute	• Irritation of skin, eyes, or respiratory tract.
Chronic	• Tamoxifen is a known human carcinogen • Both tamoxifen and 4-hydroxytamoxifen are considered to have possible reproductive, genetic, and teratogenic toxicity

Hazards and Exposure Limits	
Physical Hazards	• Combustible; development of hazardous combustion gases or vapors in the event of fire • Violent reactions possible with strong oxidizing agents
Exposure Limits	• There are no established safe levels of exposure to tamoxifen. Exposures should be reduced to as low as reasonably achievable.

Controls	
Containment, and Engineering and Administrative Controls	• Any handling, including weighing, solution preparation, and drawing doses must be done in a chemical fume hood. • All administration, cage manipulations, and handling of animals treated with Tamoxifen must be performed in a Biosafety Cabinet, or must be done while wearing a respirator, for seven days after administration.
PPE	• General: double gloves (nitrile 0.11m), safety glasses, lab coat (NO skin should be exposed between gloves and lab coat cuffs/sleeves), safety glasses or goggles • When handling animals and bedding of treated animals or performing other tasks that can lead to aerosolization an N95 must also be worn.
Emergency Equipment	Showers and eyewash station must be readily available.

MEDICAL SURVEILLANCE

No medical surveillance is required, but individuals should be aware of exposure signs and symptoms. Individuals with impaired respiratory function, airway diseases, and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

TRAINING

General training required for any chemical use and format (digital, etc. in person)

- Review of relevant information including fact sheets, SOPs, and SDS. This review should include training on hazards, symptoms of exposure, PPE, and emergency procedures.
- UW Lab Safety Training Series - New Employee Orientation, Regulated Waste Generator, and Laboratory Safety "Chemical Hygiene & GHS/OSHA

SIGNAGE AND RESTRICTED AREA INFORMATION

Signage must indicate when Tamoxifen is actively being handled and can be removed when work is completed.

Cage cards should specify that animals have been treated with Tamoxifen and must indicate whether bedding or cages are considered contaminated (for a minimum of seven days after last administration).

ANIMAL METABOLISM OF CHEMICAL

Tamoxifen and its metabolites may be excreted in the feces and urine for seven days following administration.

DISINFECTION AND INACTIVATION

- Surfaces should be disinfected with a 70% alcohol solution.
- After disinfection, rinse surfaces with water.
- Avoid oxidizing agents such as accelerated hydrogen peroxide and bleach.

CAGE/HOUSING MANAGEMENT

- Cage changes should occur no sooner than seven days after last administration.
- For the first cage after administration the water bottle, feeder, and bedding must be autoclaved before dumping.

WASTE DISPOSAL

- Toxic to aquatic life, do not dispose of down the drain.
- Contaminated clothing and PPE, and contaminated solid waste must be treated as hazardous and autoclaved.
- Disposed of as non-regulated solid waste per UW hazardous/chemical waste guidelines, located on the RMMC webpage <https://www.uwyo.edu/safety/rmmc/waste-management.html>

SPILLS/RELEASES

- For spills outside of chemical fume hood, restrict access to area, replace contaminated PPE, and don an N95 respirator
- Liquid spills: Absorb with sawdust, earth, sand, or activated carbon. Sweep up spill material being careful not to create dust/aerosols.
- Powder spills: Wipe up powder with wipes, avoiding the production of aerosols.
- Spill clean-up materials should be treated as hazardous waste and autoclaved.
- For large spills or assistance/guidance with clean up, call the Regulated Material Management Center (RMMC) 766-3698 or 766-3697

EMERGENCIES/MEDICAL GUIDANCE FOR EXPOSURES

- For accidental ingestion, contact Poison Control.
- In case of medical emergency call 911, or seek attention immediately:
 - During business hours: Iverson Urgent Care is the occupational health provider, and it is available to assist in the arrangement of medical evaluation and treatment
 - After business hours: Emergency Room or Urgent Care
- Report all accidents, injuries, illnesses or exposures as soon as possible:
https://www.uwyo.edu/safety/procedures/incident-injury_reporting.html

CONTACT INFORMATION

Poison Control:	1-800-222-1222
Chemical Specialist:	Kevin Macartney: 307-766-6116
Occupational Health:	Bailey Wallace: 307-766-3203

Acknowledgment

This document was developed using adapted material from Colorado State University, with modifications to reflect institutional policies and procedures at University of Wyoming.