

Use of N-ethyl-N-nitrosourea (ENU)

Purpose:

To provide guidance for the use of N-ethyl-N-nitrosourea (ENU) in the laboratory and animal facility environment. N-ethyl-N-nitrosourea is used in research at UW-Madison to induce mutations in gametes; for a given gene in mice, ENU is also used to induce mutations in cancer research. ENU (chemical formula C₃H₇N₃O₂), is a highly potent mutagen, it is also toxic at high doses.

Precautions:

The following information can be used to complete the Safety section of your animal protocol.

1. Chemical hazard agents – (Identify the category of the chemical): (*Select the following*)
 - Irritant (skin and respiratory)
 - Carcinogen
 - Reproductive Hazard/Teratogen
 - Toxicant/Toxic Agent
2. Containment preparation – (Containment equipment required for the preparation of the chemical):
3. (*Select one of the following*)
 - Fume Hood
 - OR**
 - Ducted Biosafety Cabinet (BSC)
4. Containment animals – (Containment equipment required for chemical administration and handling animals after exposure to the chemical): (*Select one of the following*)
 - Biosafety Cabinet (BSC)
 - OR**
 - Fume Hood
5. PPE needed - (for handling live animals, carcasses or animal waste/dirty bedding): (*Select the following*)
 - Exam gloves – nitrile
 - Safety glasses/goggles
 - Lab coat or disposable gown
 - Respirator

6. Waste Disposal: (disposal of animal waste/dirty bedding from animals after exposure to the chemical) (*Select both options and include additional information for Other*)

- Bag animal waste/dirty bedding and place sealed bag in secondary container and place secondary container in regular trash.
- Other: Chemical Hazard Cage Labels is required on each individual cage containing the chemical health hazard symbol and “Agent and Disposal method”. Labels are removed or crossed out when special handling time has ended. * Chemical Hazard Cage Labels are available at www.ehs.wisc.edu/ehs-signage.

For Aquatic Use: (*Select Other and include additional information*)

- Other:
After use, diluted ENU is poured into a labeled waste container, and this waste container is picked up by Chemical Safety for disposal. *Contact Chemical Safety for pickup at <https://ehs.wisc.edu/disposal-services/chemical-disposal/>. Chemical Hazard Cage Labels are required on each individual tank containing the hazard and must contain the chemical health hazard symbol and “Agent and disposal method”. Labels are removed or crossed out when the special handling time has ended. *Chemical Hazard Cage Labels are available at www.ehs.wisc.edu/ehs-signage.
- **Note:** Please contact chemical safety regarding the quantity and concentration of the chemical you will be using to determine if additional disposal requirements are needed.

7. Carcass disposal: (*Select the following*)

- Pick up by EH&S for incineration.

8. Chemical human risk: (*Add the following*)

- ENU is a teratogen that targets spermatogonia cells and induces mutations in sperm. Capable of inducing heritable genetic mutations in gametes. Pregnant and lactating women should avoid exposure to ENU and animals that have been administered ENU. Nitrosamines are suspected of causing cancers of the lung, nasal sinuses, brain, esophagus, stomach, liver, bladder, and kidney. ENU is a white powder. Possible human carcinogen.

References:

“ENU SDS”

<http://www.sigmaaldrich.com/catalog/product/sigma/n3385?lang=en®ion=US>

<https://cdn.caymanchem.com/cdn/msds/36264m.pdf>