



A. PURPOSE

To provide guidance on the use of drugs and compounds in animals.

B. GUIDELINES

OLAW, USDA, and AAALAC require that pharmaceutical-grade compounds be used in animal research, wherever possible. The rationale is that pharmaceutical-grade compounds meet established standards of purity, which ensures animal health and wellbeing and the validity of experimental results. Lower grade chemicals contain impurities that have the potential to introduce experimental variability or may have toxic effects on animals.

A pharmaceutical-grade compound is defined as any active or inactive drug, biologic or reagent, for which a chemical purity standard has been established by a recognized national or regional pharmacopeia (e.g., the U.S. Pharmacopeia (USP), National Formulary (NF), etc...). These standards are used by manufacturers to help ensure the products are of the appropriate chemical purity and quality, in the appropriate solution or compound, and to ensure stability, safety and efficacy.

Drugs and compounds can be administered to animals for two purposes:

- **Clinical use**
 - Compounds used for the clinical treatment of animals and to prevent or reduce/eliminate animal pain or distress, e.g., analgesia, anesthetics, euthanasia agents
 - Whenever possible, pharmaceutical-grade compounds must be used
 - USP diluents must be used when compounding clinical drugs, such as anesthetic cocktails
- **Research use**
 - Compounds are administered to accomplish the scientific aims of the study
 - If available, and suitable, pharmaceutical-grade compounds must be used
 - USP diluents must be used, whenever possible
 - Mixing a pharmaceutical-grade compound with a non-USP diluent renders the compound non-pharmaceutical-grade

OLAW, USDA, and AAALAC recognize that the use of non-pharmaceutical-grade compounds may be necessary to meet research objectives. The use of non-pharmaceutical-grade compounds may be approved by the IACUC in the following circumstances:

- If there is no veterinary or human pharmaceutical-grade drug available to meet the experimental objectives; and
- There is appropriate scientific justification

The following are required to obtain IACUC approval if a non-pharmaceutical-grade compound must be used to meet study objectives:

- The protocol or amendment must state that a non-pharmaceutical-grade compound will be used
- Scientific justification for its use must address:
 - Scientific necessity and/or lack of a commercially prepared, pharmaceutical-grade compound
 - Whether alternate pharmaceutical-grade drugs for the same purpose are available, and if so, why they cannot be used instead (e.g., ketamine-xylazine vs. tribromoethanol)
 - Convenience or prior experience with a particular substance is not considered adequate justification for using a non-pharmaceutical-grade compound
 - Cost is generally not considered adequate justification for using a non-pharmaceutical-grade compound, although the IACUC may approve the use of a non-pharmaceutical grade drug when



the cost to obtain the pharmaceutical grade version is excessively prohibitive (e.g., sodium pentobarbital)

- An SOP detailing preparation of the compound must be included with the protocol or amendment

Provisos:

- Non-medical-grade CO₂ may be used for euthanasia without scientific justification.
- OLAW recognizes the difficulty and extreme cost of obtaining pharmaceutical-grade sodium pentobarbital (Nembutal). Accordingly, the IACUC will approve the use of non-pharmaceutical-grade sodium pentobarbital without additional justification, providing that the use of non-pharmaceutical grade is noted and an SOP is completed.

C. REFERENCES, MATERIALS, AND/OR ADDITIONAL INFORMATION

- OLAW: <http://grants.nih.gov/grants/olaw/faqs.htm#f4>
- USDA: https://www.aphis.usda.gov/aphis/ourfocus/animalwelfare/SA_Publications
- AAALAC: [FAQs - AAALAC](#)
- I-IC-GU-608 Compound Preparation and Use of Secondary Containers:
<https://research.arizona.edu/compliance/IACUC/policies-procedures-and-guidelines>