Animal Resources Center NEWSLETTER

Spring 2007

ARC Website: www.utexas.edu/research/arc/

AAALAC SITE VISIT: A SUCCESS

During Oct. 31st -Nov. 2nd 2006 a site visit team from the Association for the Assessment and Accreditation of Laboratory Animal Care, International (AAALAC) toured vertebrate animal care and use areas on the main Austin campus and the marine science and aquaculture locations in Port Aransas. A large number of UT-Austin faculty, staff, and students participated by explaining their research, describing their procedures, providing examples of their documentation, and answering questions. The site visitors thoroughly reviewed the Program Description (a 140-page document prepared by the institution) and met with the Institutional Animal Care and Use Committee (IACUC) as well as key representatives from the administration and the Animal Resources Center (ARC).

We recently received the official notice of the review from the AAALAC Council. Based on the triennial site visit, the institution was given the continuing status of "Full Accreditation." Areas that were specifically commended include the IACUC oversight of animal-based research, the comprehensive Laboratory Animal Occupational Health Program, the program for environmental enrichment, and general animal husbandry practices in the ARC. Some formal and informal suggestions for further improvement were provided as part of the review process, and these will serve as potential goals as we prepare for the next visit, expected to occur in 2009.

ARC ORIENTATION CLASSES

Friday, April 27, 2007 at 1:30PM
COM Room 8
Friday, June 18, 2006 at 1:30PM
COM Room 8

This class is listed in TXClass as **AN 1**. To register or to find more information on training requirements for animal users at UT-Austin, go to the training section of the ARC website:
http://www.utexas.edu/research/arc/misc/training.htm

WORLD LABORATORY ANIMAL LIBERATION WEEK

Sunday April 22nd – Saturday April 28th
REVIEW SECURITY PRECAUTIONS!

The last week in April (also known as World Week for Animals in Laboratories) is promoted by anti-research activists around the world as a time for protests, media events, and other actions against the use of animals in biomedical research. Historically, student groups at UT-Austin have marched or protested at locations along Dean Keeton/Speedway or set up tables at the South or West Mall. However, based on past experiences at other institutions, other activities can sometimes occur during this week, including direct confrontation, harassment, property damage, or attempts at research lab break-ins.

This is an opportune time for investigators to assure that their staff understands the serious responsibilities that go along with access to campus animal facilities. Please be watchful for strangers or unusual activity around animal care and use locations during this time. Individuals authorized to have access to animal facilities should always carry their UT photo-ID badge and be prepared to show identification if requested by the UT-PD or the ARC management. DO NOT PROP DOORS OPEN OR ALLOW PERSONS UNKNOWN TO YOU FOLLOW YOU INTO THE FACILITY!

More information on Animal Liberation Week and a response plan for reporting concerns are included elsewhere in this newsletter. For additional questions, please contact the ARC Director.

THIS MONTH'S CONTENTS

ANIMAL ORDERING CHANGES

As part of a server and software upgrade, some new features have been added to the ARC Animal Order Database. As of 2/1/07, after the "submit" button is pushed, a confirmation screen with an order-specific confirmation number should appear. Please keep track of that number so you can use it as a reference if you have questions pertaining to the order because it will help the ARC administrative staff quickly locate the order in question. The other feature added is an email confirmation that will be sent after the order has been placed and the anticipated arrival date is known. To take advantage of this feature, be sure to enter the email address to which you want the order and arrival information sent to as you fill out the form. In addition to these changes, we are now sending out confirmatory emails to alert labs when the animals have been delivered, although we can continue to do that via a phone call upon specific request.

When you are submitting the animal order, please make sure you are filling the form out completely, including the building and room # where you want the animals to be housed. If you are not sure of the appropriate room number, you can contact Nachi Shukla (x2-2043) before you submit the order. For questions about the animal ordering process or to follow-up on a specific order, please contact Cheri Brinkmeyer (x1-2393).

MOUSE GENETIC ENGINEERING FACILITY UPDATE – RAT SERVICES NOW AVAILABLE

The Institute for Cellular and Molecular Biology (ICMB) provides a campus core facility for creating transgenic and knockout mouse strains. This core, the Mouse Genetic Engineering Facility (MGEF), has laboratory and procedural space in the ARC Annex, and also maintains the associated SPF rodent barrier facility.

Shan Maika, the Manager of the MGEF, has announced that the core is now branching out to produce transgenic rats. After investigating the interest in the use of transgenic rats, she received enough positive responses to get ICMB approval to begin pulling together the necessary equipment, space, reagents, etc. to offer this service. She is now pleased to report that everything is in place to make transgenic rats by pronuclear injection. In her words, they are now officially "open for business". Interested individuals can check out their web site by going to http://www.icmb.utexas.edu/core/ and clicking on the mouse link.

IACUC TRAINING REQUIREMENTS AND PROTOCOL SUBMISSIONS

When the IACUC training moved to online content and course registration, it was anticipated that new personnel would take the required online training modules, register for orientation, and submit a health surveillance questionnaire in advance, so that by the time their name was listed on a new submission being submitted to the IACUC (a full protocol, renewal, or modification) they would already show up in the databases as having completed the minimum training.

Unfortunately, that is not what is happening. As a result, the most common reason for the IACUC to have to delay or defer approval is that one or more people listed in a submission have not met the minimum training requirements. This affects the entire protocol approval process, and the ensuing attempts to follow-up and confirm subsequent training are time-consuming for the staff in the Office of Research Support and Compliance (the home of the IACUC coordinator) and frustrating to the principal investigators involved. These delays have the potential to affect the timeliness of grant funding as well.

Investigators are reminded to be sure training requirements are complete PRIOR to submission of forms to the IACUC in order to avoid delays or potential regulatory noncompliance. For a full description of the current requirements, please see the Attachments section.

BUDGETING FOR FY07-08

The last ARC rate increase was implemented in January 2006, and although the budget process is not yet complete, we anticipate announcing another increase for September 2007. More info will follow when the decision is finalized.

The suggested rule of thumb when submitting grants and preparing budgets is to allow for per diem and service costs to increase 3-5% per year. The ARC works hard to minimize costs and maximize efficiency, but rates do need to increase to keep pace with costs. For example, the recent increase in the UT-Austin institutional minimum wage resulted in a well-deserved 10% salary increase for a number of persons on the animal care staff, but that increase needs to be recovered through service center charges. Transportation and fuel cost increases have also affected the prices of many of our bulk items, which are other prime contributors to animal facility costs.

Animal Resources Center

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www.utexas.edu/research/arc/

Institutional Animal Care and Use Committee

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IACUC Voice Line
Please call (512) 475-8650

IACUC Website

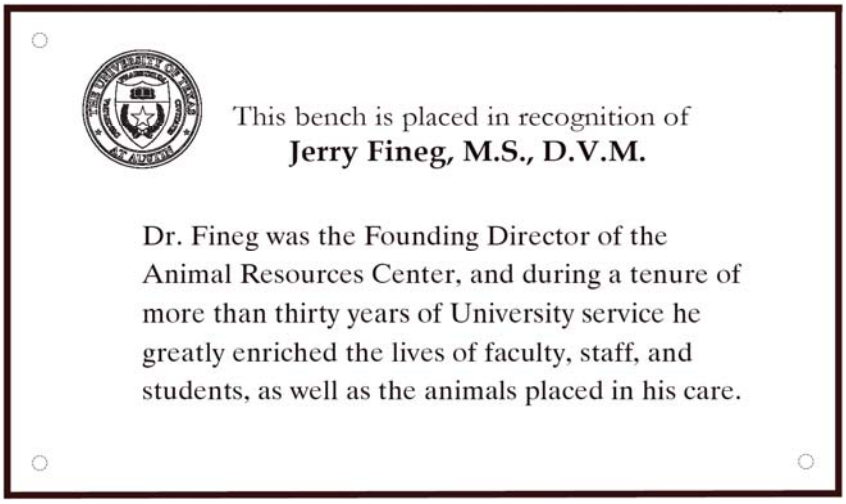
http://www.utexas.edu/research/rsc/animalresearch/

NOTE: The IACUC is a component of the Office of Research Support and Compliance (ORSC)

RECEPTION TO HONOR DR. JERRY FINEG

Dr. Fineg retired from his position in the Animal Resources Center at the end of the last academic year. A reception was held at the Campus Club Lounge on August 30th to recognize his contributions to the campus research enterprise over the past thirty-three years. A large number of family, friends, colleagues, and guests were on hand to show appreciation and to wish him well. Glen Otto, Steve Leslie, and Juan Sanchez made brief comments. The event culminated in the announcement that a commemorative plaque and bench were to be dedicated to Jerry and placed at the entrance to the Animal Resources Center building, which was built in 1975 under Dr. Fineg's guidance.

Jerry retained his faculty position and teaching responsibilities in the School of Pharmacy, so you can expect to continue to see him around campus.



The ARC staff at Dr. Fineg's retirement.

Description of This Issue's Newsletter Attachments

1) IACUC Guidelines For The Humane Euthanasia Of Laboratory Animals

The main document and two appendices (CO2 and Cervical Dislocation) thoroughly describe the principles and practices that must be taken into account at UT-Austin when determining the method of euthanasia for vertebrate animals. The requirement for assuring death by using a second method whenever CO2 is used is a major change that labs using this method must incorporate.

2) ARC Guideline on Health Checks and Illness Reporting

A document that describes the requirements for daily animal observation to identify sick or distressed animals. Applicable to all laboratories maintaining vertebrate animals.

3) World Laboratory Animal Liberation Week Information and Communication Plan.

A memorandum giving background information on this annual event and providing an emergency communication plan. Investigators should disseminate this information to their laboratory staff.

4) IACUC Training Requirements

This summary of requirements is reproduced from the Office of Research and Compliance Support (ORSC) web site. To view this information with the hyperlinks intact, go to http://www.utexas.edu/research/rsc/animalresearch/ and click on "Training."

For any comments or suggestions regarding the ARC Newsletter, please contact Dr. Glen Otto.

GUIDELINES FOR THE HUMANE EUTHANASIA OF LABORATORY ANIMALS
The University of Texas at Austin
Institutional Animal Care and Use Committee (IACUC)

These guidelines have been written to assist faculty, staff and students in performing vertebrate animal procedures in a humane manner and complying with pertinent regulatory requirements. Under some circumstances deviations from these procedures may be indicated, but such variances must be approved in advance by the IACUC.

Version 1.0 March 1, 2007

This document provides information to be used when planning and performing euthanasia of vertebrate animals used for biomedical research or teaching at The University of Texas at Austin. It is organized into four parts:

Section 1 – Background
Section 2 – Recommended Methods
Section 3 – Technical Comments
Appendices

Section 1 - GENERAL BACKGROUND

Definition

The NIH Guide for the Care and Use of Laboratory Animals defines euthanasia as "the procedure of killing animals rapidly and painlessly". Techniques used for euthanasia must be chosen to assure that a rapid loss of consciousness will occur, followed shortly by death without pain or significant distress being perceived by the animal.

Humane Considerations

There is a wide variety of animal species used in biomedical research, and specific methods used for each species must be considered based on their anatomy and physiology. However, the general principles for humane euthanasia in all species have been summarized by the International Council for Laboratory Animal Science (2006):

Principles for Animal Euthanasia

http://www.sciencemag.org/cgi/reprint/312/5774/700.pdf

1. Whenever an animal's life is to be taken, it should be treated with the highest respect.
2. Euthanasia should place emphasis on making the animal's death painless and distress-free. The method likely to cause the least pain and distress to the animals should be used whenever possible.
3. Euthanasia techniques should result in rapid loss of consciousness, followed by cardiac or respiratory arrest and ultimate loss of brain function.
4. Techniques should require minimum restraint of the animal and should minimize distress and anxiety experienced by the animal, before loss of consciousness.

5. Techniques used should be appropriate for the species, age, and health of the animal.
6. Death must be verified following euthanasia and before disposal of the animal.
7. Personnel responsible for carrying out the euthanasia techniques should be trained: (i) to carry out euthanasia in the most effective and humane manner; (ii) to recognize signs of pain, fear, and distress in relevant species; and (iii) to recognize and confirm death in relevant species.
8. Human psychological responses to euthanasia should be taken into account when selecting the method of euthanasia, but should not take precedence over animal welfare considerations.
9. Ethics committees (e.g., an IACUC) should be responsible for approval of the method of euthanasia (in line with any relevant legislation). This should include euthanasia as part of the experimental protocol, as well as euthanasia for animals experiencing unanticipated pain and distress.
10. A veterinarian experienced with the species in question should be consulted when selecting the method of euthanasia, particularly when little species-specific euthanasia research has been done.

Gentle, careful handling of subject animals is of the utmost importance during the procedure in order to minimize distress to the animal. Measures should be taken to ensure that euthanasia is performed in a way that minimizes reactions among other animals that may be present. Euthanasia should be performed quickly and efficiently in a procedural area that is separate from rooms in which animals are housed.

When considering the impact of euthanasia on animal well-being, it is important to note that an unconscious animal does not perceive pain. Appropriately conducted procedures that render the cerebral cortex nonfunctional eliminate the perception of pain. Once this initial unconscious state is reached, reflex motor activity may still be observed, but pain is not perceived. This concept can be utilized in two-step approaches that combine an initial anesthetic event (e.g., general anesthesia via isoflurane or tricaine) with a secondary physical method (e.g., decapitation or exanguination).

Protocol Requirements

Euthanasia is generally performed at the end of a project or, in some cases, at a point where animals would otherwise experience severe or chronic pain or distress that cannot not be relieved. Because euthanasia may be needed as a means to relieve pain or distress that cannot be alleviated by analgesics, sedatives, or other treatments, protocols should include criteria for monitoring and initiating an early endpoint. This type of pre-planning for potential adverse outcomes will enable a prompt decision to be made by the research staff in conjunction with the veterinarian to ensure that the studies are humane and the objective of the protocol is achieved.

Even when the planned experiment does not include euthanasia, there may be a need to humanely euthanize animals for unanticipated reasons. For this reason, at least one method must be documented for each species used in a protocol.

Euthanasia techniques must be reviewed and approved by the Institutional Animal Care and Use Committee (IACUC) during review and approval of the submitted protocol application form. Any subsequent change in euthanasia techniques must also be reviewed and pre-approved by the IACUC. The Office for Laboratory Animal Welfare (OLAW)

characterizes the method of euthanasia as a significant component of the animal use protocol. **Use of a euthanasia technique that is not described in the approved protocol may be considered significant noncompliance, which can result in protocol suspension and mandatory reporting to the federal funding agencies that support the Principal Investigator.**

Training and Personnel Requirements

Euthanasia must be carried out by personnel properly trained in the procedure being used. This is especially important when physical methods such as decapitation, cervical dislocation or pithing are used, since these methods require a certain amount of expertise to assure a humane outcome. It is the PI's responsibility to assure that all persons performing euthanasia are properly trained and supervised. **All individuals performing euthanasia as part of a research project must be listed on the approved protocol.**

The clinical staff of the Animal Resources Center (ARC) is available to demonstrate and/or discuss euthanasia techniques.

Verification of Death

Proper euthanasia technique will include a physical examination or close observation to assure that the animal is dead prior to disposal. Death should be confirmed by personnel who can recognize cessation of vital signs in the species being euthanized. Whenever possible, the best method is to confirm the absence of a heartbeat, which is a reliable indicator of death in most species. Monitoring respiration by observing chest movement is less valuable, because a heartbeat may continue after visible respiration has ceased. If respiratory movement is the only criteria, observation should continue for a prolonged period after euthanasia (e.g., 10-15 minutes for mammals). Verification of death is especially important when CO2 or anesthetic gases are used and the animal is discarded intact, i.e., it is not used for tissue harvest or other invasive postmortem procedures.

It is recommended that a secondary physical method such as decapitation, cervical dislocation or thoracotomy be used to assure death in birds and mammals. Pithing or rapid freezing are additional techniques that can be used to verify death of cold-blooded animals. A written description of the secondary physical method(s) to be used will be required for studies using gaseous anesthetics or CO2 for euthanasia if animals are discarded intact.

Equipment Used for Physical Methods

Physical methods may include the use of instruments that are blunt (e.g., cervical dislocation), or sharp (e.g., decapitation or pithing). The Principal Investigator must assure that the choice of instrument is appropriate for the size and the anatomical conformation of the animal involved, with input from the Attending Veterinarian as

needed. In many cases the use of specialized equipment such as a custom guillotine or enterotomy scissors will perform better than conventional scissors, knives or scalpels. Each lab must provide for the proper periodic evaluation and sharpening or replacement of equipment to assure proper function.

Best Practice Information

The primary source document for appropriate euthanasia practices in the U.S. is the Report of the AVMA Panel on Euthanasia, last updated in 2000. However, the committee writing that report recognized that it cannot be considered an all-encompassing document, and the language allows the use of professional judgment based on other current literature sources. The following reference list includes some of the most useful and readily available sources to be used when euthanasia methods are being considered.

U.S. Guidance

Report of the AVMA Panel on Euthanasia (2000)
American Veterinary Medical Association
http://www.avma.org/issues/animal_welfare/euthanasia.pdf

Guide for the Care and Use of Laboratory Animals (1996)
Institute for Laboratory Animal Research
http://fermat.nap.edu/books/0309053773/html

International Sources

Guide to the Care and Use of Experimental Animals – Euthanasia (1993)
Canadian Council on Animal Care
http://www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GUIDES/ENGLISH/V1_93/CHAP/CHXII.HTM

Recommendations For Euthanasia Of Experimental Animals
Part 1 (1996) and Part 2(1997)
European Commission
http://www.lal.org.uk/pdffiles/LA1.pdf
http://www.lal.org.uk/pdffiles/LA2.pdf

Euthanasia of Animals Used for Scientific Purposes
Australian and New Zealand Council for the Care of Animals in Research and Teaching
http://www.adelaide.edu.au/ANZCCART/news/Euthanasia.pdf

Species-Specific Information

Report of the ACLAM Task Force on Rodent Euthanasia (2005)
American College of Laboratory Animal Medicine
http://www.aclam.org/PDF/pub_rodent_euth.pdf

Guidelines For Use Of Live Amphibians And Reptiles In Field And Laboratory Research (2004)
American Society of Ichthyologists and Herpetologists
http://web.archive.org/web/20060214112806/www.asih.org/pubs/ASIH_HACC_Final.PDF

Guidelines To The Use Of Wild Birds In Research (1999)
THE ORNITHOLOGICAL COUNCIL
http://www.nmnh.si.edu/BIRDNET/GuideToUse/Guidelines_2d_edition.pdf

Fish Research and the Institutional Animal Care and Use Committee (2003)
Institute for Laboratory Animal Resources
http://dels.nas.edu/ilar_n/ilarjournal/44_4/v4404Borski.pdf

Guidelines for the Use of Fishes in Research (2004)
American Fisheries Society
http://web.fisheries.org/main/images/stories/afs/guidelines2004.pdf

Study Considerations and Alternatives

It must be recognized that it is extremely important for experiments be planned and performed in a way that ensures the validity of the data produced. If the euthanasia method used interferes with the ultimate goals of the research study and makes the data unusable, then the lives of the animals may have been wasted. Careful consideration of the possible adverse effects of the various options available must occur. There may occasionally be special circumstances or situations in which options that are not listed in this document might be considered acceptable. These exceptions must be carefully considered by the investigator and the IACUC to assure the best outcome for the animals as well as the study.

Section 2 - RECOMMENDED AGENTS AND METHODS OF EUTHANASIA LISTED BY SPECIES

The selection of specific agents and methods for euthanasia will depend on the species involved and the objectives of the protocol. Generally, inhalant or noninhalant chemical agents (such as barbiturates, inhalant anesthetics, or CO2) are preferable to physical methods (such as cervical dislocation or decapitation). However, scientific considerations might preclude the use of chemical agents for some experimental studies. All methods of euthanasia must be reviewed and approved by the IACUC. Specific justification will be required when physical methods are used as the sole method on fully conscious animals.

AMPHIBIANS

- Inhalant anesthetics
- CO2
- Barbiturates
- Tricaine methane sulfonate (MS222)

- Double pithing
- Benzocaine hydrochloride
- Chlorobutanol (Chlorotone)
- Physical methods such as decapitation or pithing after sedation

- Conditionally acceptable - Single pithing; decapitation; stunning followed by decapitation

BIRDS

- Inhalant anesthetics
- CO2
- Barbiturates
- Physical methods such as decapitation or cervical dislocation after sedation

- Conditionally acceptable: cervical dislocation; decapitation;

CATS/DOGS

- Inhalant anesthetics
- CO2
- Barbiturates
- Potassium chloride or exsanguination (under general anesthesia)

FISH

- Tricaine methane sulfonate (MS222)
- Benzocaine hydrochloride
- Quinaldine
- Clove oil
- Barbiturates
- Inhalant anesthetics
- 2-phenoxyethanol
- Chlorobutanol (Chlorotone)
- Physical methods such as decapitation followed by pithing after sedation

- Conditionally acceptable: stunning followed by decapitation/pithing; decapitation and pithing alone (smaller species)

NONHUMAN PRIMATES

- Barbiturates
- Potassium chloride or exsanguination (under general anesthesia)

- Conditionally acceptable: inhalant anesthetics; CO2

RABBITS

- Inhalant anesthetics
- CO2
- Barbiturates
- Potassium chloride or exsanguination (under general anesthesia)

- Conditionally acceptable: cervical dislocation (< 1 kg); decapitation

REPTILES

- Barbiturates
- Inhalant anesthetics (in appropriate species)
- CO2 (in appropriate species)
- Physical methods such as decapitation after sedation

- Conditionally acceptable - stunning and decapitation; decapitation and pithing

RATS, MICE AND OTHER SMALL MAMMALS

- Inhalant anesthetics (halothane, isoflurane)
- CO2
- Barbiturates
- Potassium chloride or exsanguination (under general anesthesia)
- Physical methods such as decapitation or cervical dislocation after sedation

- Conditionally acceptable: methoxyflurane; cervical dislocation (< 200 g); decapitation

SWINE

- Barbiturates
- Potassium chloride or exsanguination (under general anesthesia)

- Conditionally acceptable: inhalant anesthetics or CO2

Section 3 – TECHNICAL COMMENTS ON AGENTS AND METHODS

Inhalant Anesthetics

Because most inhalant anesthetics act as topical irritants in their liquid state, animals should be exposed to the vapors of the anesthetic only. Chambers must be designed to assure the animals don’t come into contact with the wicking material that may be saturated with the liquid phase of the anesthetic. Sufficient air or oxygen must be

provided during the induction period to avoid hypoxia prior to unconsciousness. All agents are given "to effect" until respiratory and cardiac arrest occurs.

Halothane and **isoflurane** have the most rapid action, and since halothane is better tolerated, it is preferred. Methoxyflurane is less suitable, due to its slow effect and poor market availability. Care should be taken to minimize personnel exposure to vapors.

Ether has historically been used as a euthanasia agent. However, it is highly flammable, can form explosive peroxides after exposure to air and light, and is known to be a distressful irritant when administered to animals. Considering the disadvantages, **ether should not be used for routine euthanasia** of laboratory animals. If an investigator has a very compelling requirement for ether based on the needs of a particular study, a proposal can be submitted for consideration by the IACUC and EH&S to determine if there is sufficient justification and to assure that proper safety precautions will be taken.

Non-Anesthetic Gases

Most agents in this category require the use of special equipment.

Carbon dioxide has long been the preferred technique for euthanizing rodents and other small laboratory animals. Use of a sealed chamber filled by a compressed gas cylinder is required. CO2 generated by other methods, e.g., dry ice, is unacceptable because gas flow can't be regulated precisely. Chambers must not be overcrowded to avoid distress during the procedure. Because CO2 can act as a reversible anesthetic, it is imperative that the animals be kept in the chamber for several minutes after respiratory arrest. In order to assure death after CO2 in those circumstances where the animal is discarded intact (i.e., it is not used for tissue harvest or other invasive postmortem procedures), a physical means to assure death MUST be performed after CO2 exposure. Examples of acceptable physical methods include cervical dislocation (for mice or rats no larger than 200 grams), decapitation or thoracotomy (making a stab incision into the chest to open up the lung cavity)

Due to physiologic characteristics, neonates require prolonged exposure to the gas. For more detailed information, see Appendix 1, which provides specific information on using CO2 for rodent euthanasia.

Nitrogen, argon or **carbon monoxide** may be acceptable under specific and unique situations but have no clear advantages and are rarely if ever used in biomedical research.

Pharmacological Agents

Use of these agents requires adequate restraint and mastery of appropriate injection techniques.

Barbiturates are acceptable for all species, but are most commonly used for mammalian species and birds. These drugs should be administered intravenously (IV) whenever

possible, but intraperitoneal (IP) or intracoelomic administration is acceptable for rodents, amphibians, reptiles and fish. Intracardiac injection is an alternative, but this should be done only on animals that are sedated or anesthetized. **Sodium pentobarbital** is the most common barbiturate agent for euthanasia, used either alone or in commercially available euthanasia mixtures. The dosage is usually at least twice that required for anesthesia, and ranges from 85 mg/kg for larger species to 200 mg/kg for some rodents. A dosage of 120 mg/kg is sufficient for most species, but more should be given if death does not ensue. Commercial euthanasia formulations should be used following label directions (e.g., 1 ml/lb for Beuthanasia-D). Sodium pentobarbital is a Class II controlled substance that is tightly regulated. Investigators using this agent must have current federal (DEA) and state (DPS) registration approval and are required to store the drug in a locked location and maintain detailed daily use records. For more information, contact the Environmental Health and Safety (EHS) office.

Euthanasia using **potassium chloride** is permissible only in an anesthetized animal. Concentrated KCl should be given rapidly IV until rising serum potassium levels result in cardiac arrest.

Tricaine methane sulfonate (MS222) is a useful agent for aquatic species. It can be used either as an injectable agent (200-300 mg/kg of a 1% solution in physiologic saline) or more commonly as an immersion bath (500 mg/liter in H2O) for amphibians and fish. When used in freshwater, the pH of the solution should be tested and buffered to neutrality as needed with sodium bicarbonate. The immersion time needed to assure death can range from 20 minutes to three hours, so it may be advantageous to use MS222 as an initial anesthetic step followed by a physical method of euthanasia. Note: Cutaneous exposure to MS222 can cause retinal toxicity. Gloves should be worn at all times when handling fish and amphibians, and in particular when using MS222. **Benzocaine hydrochloride** (250-500 mg/liter) can be used as an alternative for amphibians and fish.

Other useful immersion agents for fish include **quinaldine** (100 mg/liter) and **chlorobutanol** (300 mg/liter). **Clove oil** contains eugenol as the active compound, and the current literature states that it is an acceptable agent for fish euthanasia (400 mg/liter). **2-phenoxyethanol** can be used (0.6 ml of the liquid compound per liter) but it is not a preferred method because it can be slow acting in some species and adverse reactions can occur prior to unconsciousness.

NOTE: The poor aqueous solubility of some of the agents used for immersion methods may require the initial preparation of a concentrated stock solution in an alternative solvent. Acceptable protocols for such preparation are available in the literature and should be used.

An overdose with non-barbiturate injectable anesthetic (e.g., ketamine/xylazine or tribromoethanol) is not acceptable as a sole method, but such drugs can be used to sedate or anesthetize animals prior to the use of a physical method in a two-step procedure.

Physical Methods

These methods require that the user have experience and skill in the techniques to be used.

Exsanguination is acceptable for all species if the animal is first rendered unconscious by another method. Rapid removal of blood can be accomplished by severing major vessels or (in smaller animals) by cardiac venipuncture.

Cervical dislocation is acceptable for mice, birds, rats (< 200 gm) and rabbits (< 1 Kg), but proper technique is essential. It is therefore recommended that animals be first sedated with another agent (carbon dioxide, pentobarbital or halothane are suggested). Its use as a sole means of euthanasia requires scientific justification and IACUC approval. For more detailed information, see Appendix 2, which provides specific information on the use of cervical dislocation for euthanasia of rodents.

Decapitation with proper equipment may be performed on small mammals or birds after the animal has been sedated or lightly anesthetized (carbon dioxide, pentobarbital or halothane are suggested). Decapitation of fish, amphibians and reptiles should be followed by cranial pithing (see below) to assure rapid loss of brain function. Use of decapitation as a sole means of euthanasia in any species requires scientific justification and IACUC approval. Decapitation should generally be used only when study design requires it due to the potential hazard to personnel and the possibility of operator error leading to a prolonged or distressful death. Many species react adversely to the smell of blood, so animals should not be decapitated in the presence of other animals and the person performing decapitation should change gloves and/or wash hands between animals. Adult rodents should be decapitated with a commercially available guillotine unless the procedure is performed under anesthesia or after cervical dislocation.

Pithing is the insertion of an instrument into the central nervous system (brain case or spinal canal) to quickly disrupt consciousness and cause death. Pithing of both the brain and the spinal cord (double pithing) may be used as the sole means of euthanasia in frogs of the genus Rana or other amphibians with anatomic features that facilitate easy access to the central nervous system. In all other amphibian and reptile species, pithing should be followed by complete decapitation.

Other physical methods - Under very specialized circumstances, other methods such as stunning, thoracic compression or air embolism (under anesthesia) may be allowed in small species if research needs make it necessary and there are no available alternatives. Use of hypothermia (ice water) or freezing is not considered to be acceptable for routine euthanasia, although hypothermia can be used as an adjunct method in fish, amphibians or reptiles prior to the use of a physical method. Freezing can be used as a secondary method to assure death after a chemical or physical method has been used to kill the animal (often useful for ectotherms) but, if an anesthetic gas or CO2 has been used, another physical method should be used to assure death prior to placing animals in a freezer.

GUIDELINES FOR THE HUMANE EUTHANASIA OF LABORATORY ANIMALS
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These guidelines have been written to assist faculty, staff and students in performing vertebrate animal procedures in a humane manner and complying with pertinent regulatory requirements. Under some circumstances deviations from these procedures may be indicated, but such variances must be approved in advance by the IACUC.

Appendix 1: Use Of Carbon Dioxide For Rodent Euthanasia

Version 1.0 March 1, 2007

SUMMARY: Carbon dioxide (CO2) euthanasia must be performed by trained individuals using appropriate equipment. The use of CO2 as a euthanasia method and the names of the individuals performing this procedure must be listed in the approved IACUC protocol covering the study. One of two methods (pre-fill or slow-fill) can be chosen based on the circumstances surrounding euthanasia. A secondary physical means to assure death **must be utilized** prior to disposal of the carcass when CO2 is used for euthanasia.

TRAINING: Principal Investigators must ensure that all individuals responsible for administering CO2 euthanasia are appropriately qualified and monitored, and that they adhere to IACUC-approved protocols and institutional policies. Training can be provided from within the lab group if the existing staff has adequate expertise. Additional training in these techniques is available from the Animal Resources Center (ARC). Personnel who will be performing these techniques (or their PIs) can arrange training by contacting the ARC Training and Compliance Manager (ph.# 471-3909)

GUIDANCE:

I. Characteristics

Carbon dioxide (CO2) is currently considered to be a safe and humane method of euthanasia that has long been the preferred technique for use with rodents. The gas is inexpensive, nonflammable, and nonexplosive. Use of an appropriate chamber allows groups of rodents to be rapidly euthanized simultaneously. It causes no accumulation of exogenous chemical residues in tissues nor does it produce observable histological changes (with the notable exception of pulmonary tissues). It can be administered using fairly simple equipment that can be located centrally in a facility or fixed to a mobile platform for portable use. Exposure to high concentrations of CO2 has an initial rapid depressant and anesthetic effect, which is followed by death through asphyxiation while the animal is unconscious.

Carbon dioxide must be purchased and utilized in compressed gas cylinders. CO2 generated from other sources, such as dry ice or fire extinguishers is unacceptable because gas flow cannot be regulated precisely in those circumstances.

II. Humane Considerations

Exposing animals to a CO2 concentration of 70% or more can induce unconsciousness very rapidly, and the use of a 100% CO2 atmosphere (by prefilling the chamber) will result in the quickest time to death. For this reason, prefilling is considered to be the most foolproof method of using CO2. However, high concentrations of CO2 can cause a marked bradycardia in rats and mice, presumably via nasal chemoreceptors. Because humans perceive CO2 exposure of the nasal mucosa at similar concentrations to be a noxious stimulus, it has been proposed that high concentrations of CO2 should be considered distressful or even painful to rodents. This has led to the suggestion that it is more humane to expose rodents to a gradually rising concentration that will cause narcosis before the respiratory tissues are exposed to high concentrations. The downside of this approach is that it will prolong the time to narcosis and death, and recent studies have also identified the fact that rodents show strong aversive behavior when maintained in a conscious state in these lower CO2 concentrations. Unfortunately, the literature is somewhat contradictory at this time, and although controlled studies are underway at multiple institutions, the pros and cons of these two methods (prefilling vs. slow infill) are difficult to resolve into a single best method. Each method may be best suited for certain circumstances, as described below.

The most common errors that have an impact on humane euthanasia when using CO2 for euthanasia are: (1) overcrowding animals in the chamber, (2) using equipment or methods that cause the animals to be exposed to suboptimal concentrations for extended periods, and (3) not assuring that animals have been completely killed prior to disposal.

Since carbon dioxide is 50 percent heavier than air, chambers should be designed so that as they fill with gas they can vent from the top. This allows the air to exit at the top and be completely replaced by carbon dioxide. Incomplete filling of a chamber may permit tall or climbing animals to avoid exposure to an optimal concentration of gas, which can lead to prolonged distress to the animals.

Animals placed together in chambers should be of the same species. Chambers must not be overcrowded. In this regard, it is important to also consider that mixing unfamiliar or incompatible animals in the same container may be distressful. Chambers should be kept clean to minimize odors that might distress animals subsequently euthanized in the same chamber.

III. Methods

Equipment

Use of a compressed gas cylinder is required to administer CO2, and the gas delivery equipment must include an appropriate regulator that controls the delivery of gas to an exposure chamber. The top or walls of the chamber must be transparent so that animals are visible and observed during euthanasia. The top of the chamber should be closed in a way that allows the pressure of incoming gas to drive out and replace the air in the chamber, but does not allow significant quantities of room air to leak back in when the

gas is turned off. A sturdy gasketed lid held on the top of the chamber by gravity can act as a low-pressure one-way valve and is a simple solution that generally satisfies these requirements.

Examples of chambers:

1) Various commercially available or customized tops allow a **glass aquarium or acrylic box** to serve as a euthanasia chamber. These tops seal the enclosure and include inlet/outlet ports that can be connected to the supply of CO2. The simplest functional system is one that has a single hole through which a length of tubing connected to the regulator passes. When an inlet is present but no outlet, the lid should not be clamped down and sealed because air must be allowed to escape from around the rim.
Similar tops are available to euthanize animals inside standard plastic rodent cages. This allows the animal to be euthanized in its home cage, which is a preferred method.

2) A large plastic or glass **dessicator jar** with a tubulature in the top can be used if a two-holed rubber stopper is inserted. The hose from a CO2 regulator is connected to a six-to-eight-inch piece of rigid plastic or stainless steel tubing that passes through one hole of the stopper and allows the carbon dioxide to be admitted at the bottom of the chamber. A three-inch piece of plastic tubing is passed through the other hole and is connected to a short length of hose which has an adjustable screw-type clamp placed to regulate the escape of air and carbon dioxide from the top of the chamber. CAUTION: Use of a typical dessicator (single tubing inlet with a greased ground glass seal) is dangerous because the heavy, sealed lid can allow pressure to build up and subsequently blow the lid off.

3) With a minimum investment, an acceptable chamber can be made out of an inexpensive **plastic container with a lid** that can be securely attached but is not completely airtight. A small hole is punched in the lid to serve as an inlet port, through which can be passed a length of plastic tubing attached to the regulator from a carbon dioxide cylinder. If neither the chamber nor the lid is transparent, a replacement lid can be crafted out of a durable transparent plastic. Plastic bags can be used as liners, which will facilitate disposal and keep the chamber clean.

4) If the need for euthanasia is infrequent, it is possible to fill a **heavy-duty plastic bag** directly from a hose attached to a regulator. This is most useful for prolonged gassing needed for neonatal rodents. Animals are placed in a transparent bag, the majority of the air is carefully squeezed out, and the bag is carefully filled with 100% CO2 and then tied shut. The animals should be observed frequently during euthanasia until the bag is re-opened when death is assured using one of the methods listed below.

IV. Techniques

Both the pre-fill and slow infill methods are acceptable if done properly. One or the other, as suggested below will best serve certain situations. HOWEVER: the most

important criteria are that the method used does not result in prolonged signs of distress. Experience has shown that different ages, sexes, and strains of rodents can show varying reactions to CO2 exposure. If you feel that one method is not resulting in a humane death, you are urged to try the other and/or to contact the ARC for veterinary assistance in determining the best method.

1) Pre-fill

Pros: Most rapid onset of both unconsciousness and death; Simple administration; Allows sequential use of a chamber without removing residual CO2. Delivery of 100% CO2 to the empty chamber or when topping it off after animals are sedated does not require careful control of the gas flow.

Cons: Placing animals in a high concentration of CO2 may cause brief distress prior to loss of consciousness

When to Use: Sequential euthanasia of a large number of grouped (but uncrowded) animals in a chamber other than the home cage; Situations where the regulator cannot be adjusted to provide a controlled slow inflow.

Procedure: Pre-filling of a closed empty chamber can be done rapidly by using a high-volume flow rate. 100% carbon dioxide gas should be admitted into the chamber for at least 45-60 seconds. The gas is turned off and the animal is then placed inside the chamber and the lid secured. Transfer of the rodents into the chamber should be done gently but quickly in order to minimize loss of CO2 while the lid is open. If pre-filling was adequate, the animal should show signs of losing consciousness within 10-20 seconds. Once the animal is sedated, the high-flow gas can be turned on again for 15 -30 seconds to purge any remaining oxygen. The animal is then observed until all muscle activity and breathing has been absent for at least 30 seconds. A physical method is then used to verify death (see below).

2) Slow-fill

Pros: Animals are not exposed to high levels of CO2 until after they lose consciousness; Can be done without removing animals from their home cage environment.

Cons: Slower onset of unconsciousness and death; Careful adjustment of gas inflow required; Prolonged exposure to low levels of CO2 may be distressful.

When to Use: Euthanasia of a small number of animals as a single batch in a chamber; Euthanasia of entire cages using the home cage as the chamber; Euthanasia of sequential batches of animals if the chamber is thoroughly aerated between groups to remove residual CO2. Requires adequate time to perform this slower method, and careful adjustment of the CO2 delivery rate.

Procedure: The animal(s) are either placed in an empty chamber, or a CO2 delivery lid is

placed on their home cage. The flow of CO2 from the gas cylinder is started at a rate that will displace ~20% of the cage or chamber volume per minute (a very slow rate when a mouse or rat home cage is used). This rate will allow a slow increase in the concentration of CO2 to develop but will not cause noise or be perceived as a harsh "wind" to the animals. As gas levels rise to 40-50%, unconsciousness will occur as indicated by a loss of the righting reflex. At this point, the flow of the gas can be increased if desired to more rapidly fill the chamber and decrease the time to death. Gas flow can be discontinued when signs of respiration have ceased. The animal is then observed until all muscle activity and breathing has been absent for at least 30 seconds. A physical method is then used to verify death (see below).

V. Removal from Chamber and Verification of Death

Observation for vital signs

Under proper conditions, an exposure time of 3-6 minutes (depending on the fill rate) is generally adequate to kill adult animals. Before animals are removed, all visible movement (including breathing) should have stopped. Eyes are generally dilated, and mucous membranes will no longer be pink. After removal, check again to confirm respiratory arrest. If possible, verify by touch or by using a stethoscope that there is no heart beat. If an animal is found to still be conscious, it must be returned to the chamber and the gas flow restarted. If the animal is unconscious but still alive, it can either be returned to the chamber or killed via a physical method.

Physical methods to assure death

Death must be verified after euthanasia and prior to disposal. Since the anesthetic effects of CO2 are reversible, animals that are prematurely removed from the chamber prior to death can recover. Unintended recovery after the procedure will be very rare if appropriate CO2 concentrations and exposure times are used, however it is considered to be inhumane, and this must be prevented. The use of a secondary physical method to assure death is required. Examples of acceptable physical methods include:

- Cervical dislocation (for mice or rats no larger than 200 grams)
- Decapitation
- Thoracotomy (making a stab incision into the chest with a scalpel or sharp scissors to open up the lung cavity).
- Experimental procedures that assure death such as fixative perfusion, dissection and removal of the brain or other major organs, or exsanguination.

NOTE: Failure to assure death of animals can lead to the spontaneous recovery of the animal in the disposal area, which is considered a federally reportable compliance incident that requires notification of funding agencies and can lead to loss of animal protocol approval. The relevant federal guidance can be found at this link: http://grants.nih.gov/grants/guide/notice-files/NOT-OD-02-062.html

VI. Other considerations

Two-Step euthanasia (CO_2 narcosis followed by a physical method).

Rather than waiting until death is complete from asphyxiation, cervical dislocation or decapitation can be used to kill rodents after they have been sedated with CO_2. Once the animal has been exposed long enough to lose consciousness and be unresponsive to a toe pinch (analogous to a surgical plane of anesthesia) the physical method can be performed. Use of a two-step process should be detailed in the IACUC protocol if this is to be used.

Euthanasia of neonates

The time required for CO_2 euthanasia may be substantially prolonged (e.g., 10-20 min or more) in neonatal rodents due to their inherent resistance to hypoxia. For this reason, CO_2 should not be used as the sole method of euthanasia in neonates unless the animal can be exposed long enough to ensure death. As mentioned above, the plastic bag method may be the best option for prolonged exposure. Alternatively, use of a two-step method (CO_2 exposure for sedation followed by decapitation. Due to the anatomy of neonates, decapitation is more practical than cervical dislocation. Decapitation alone can be used as an alternate primary method of euthanasia for neonates, but this requires specific IACUC approval.

GUIDELINES FOR THE HUMANE EUTHANASIA OF LABORATORY ANIMALS
The University of Texas at Austin
Institutional Animal Care and Use Committee (IACUC)

These guidelines have been written to assist faculty, staff and students in performing vertebrate animal procedures in a humane manner and complying with pertinent regulatory requirements. Under some circumstances deviations from these procedures may be indicated, but such variances must be approved in advance by the IACUC.

Appendix 1: Use Of Cervical Dislocation For Rodent Euthanasia

Version 1.0 March 1, 2007

SUMMARY:

Cervical dislocation (CD) euthanasia must be performed by trained individuals using appropriate equipment. The use of cervical dislocation in rodents is only recommended for mice and small rats (<200g), and whenever possible the use of sedation or light anesthesia prior to euthanasia is recommended. The protocol must contain adequate scientific justification if CD must be performed on conscious animals due to study requirements. CD is also an appropriate means to assure death after euthanasia with CO2 or another gaseous euthanasia agent. The use of CD as a euthanasia method and the names of the individuals performing this procedure must be listed in the approved IACUC protocol covering the study.

TRAINING:

Principal Investigators must ensure that all individuals responsible for administering CD euthanasia are appropriately qualified and monitored, and that they adhere to IACUC-approved protocols and institutional policies. Training can be provided from within the lab group if the existing staff has adequate expertise. Additional training in these techniques is available from the Animal Resources Center (ARC). Personnel who will be performing these techniques (or their PIs) can arrange training by contacting the ARC Training and Compliance Manager (ph.# 471-3909)

GUIDANCE:

I. Background

The IACUC is specifically charged with reviewing the methods of euthanasia for each research protocol to assure compliance with the recommendations contained in the Report of the AVMA Panel on Euthanasia (J. Am. Vet. Med. Assoc. 2000; 218: 669 – 696; also available at <http://www.avma.org/issues/animal_welfare/euthanasia.pdf>). Since physical methods of euthanasia (such as cervical dislocation) require the most skill to perform and are most likely to be affected by human error, the AVMA Panel recommends that such methods be used only when alternative methods are not appropriate. Methods deviating from these recommendations must be "justified for scientific reasons in writing by the investigator."

II. Acceptable Use

Use of cervical dislocation to euthanize mice and rats with body weights <200g by trained personnel is appropriate (after IACUC approval) if either of the following is true:

Animals are sedated or anesthetized using drugs or carbon dioxide prior to cervical dislocation

- or -

The PI has considered other methods, and has determined that cervical dislocation without the use of other agents is the most appropriate method based on previous experience using this technique and/or the specific aims of the study.

III. Method

Before using the technique of cervical dislocation it should be practiced on anaesthetized mice until the operator is competent.

1. Restrain the rodent in a normal standing position on a firm, flat surface and grasp the base of the tail firmly with one hand. Performing the procedure on a surface that the animal can grip (such as the wire bar grid of the cage top) may make it easier to gain access to the base of the skull because rodents often stretch themselves forward when held by the tail.

2. Place a sturdy stick-type pen, a rod-shaped piece of metal, a closed scissors/hemostats or the thumb and first finger of the other hand against the back of the neck at the base of the skull.

3. To produce the dislocation, quickly push forward and down with the hand or object restraining the head while pulling backward with the hand holding the tail base.

4. The effectiveness of dislocation can be verified by feeling for a separation of cervical tissues. When the spinal cord is severed, a 2-4 mm space will be palpable between the occipital condyles and the first cervical vertebra. Occasionally, however, the dislocation occurs between thoracic vertebrae.

5. Check closely to confirm respiratory arrest, and when possible verify, by palpation, that there is no heart beat.

IV. Other considerations

Note on Euthanasia of neonates

Due to the anatomy of rat and mouse neonates less than two weeks of age, attempts to perform cervical dislocation using standard methods often results in blunt decapitation. It is more practical to simply use a sharp instrument to perform decapitation.

Animal Resourc Center
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This ARC guideline has been written to clearly communicate current standards for vertebrate animal users. Questions should be directed to Dr. Glen Otto (471-2392), the Attending Veterinarian for the campus.

Health Checks and Illness Reporting

1. This policy is not limited to ARC animal care staff, nor to animals housed in the Animal Resource Center. These requirements are applicable to all locations where vertebrate animals are maintained for biomedical research as part of UT-Austin projects.

2. All animals must be checked daily for signs of disease or illness by trained personnel who are familiar with the species. (Source: *The Guide for the Care and Use of Laboratory Animals*, National Research Council, 1996.)

3. The requirement for daily checks includes weekends and holidays.

4. Performance of health checks must be documented daily in a room log or tracking sheet by the person performing the checks. Initials are preferred, rather than just checking a box.

5. If sick or injured animals are found either during routine daily checks or while other duties are being performed in an animal area, the appropriate persons must be promptly notified. Emergency contact information should be posted to facilitate prompt reporting.

6. *Reporting for colonies in the ARC building or other centrally managed locations.* Multi-copy morbidity/mortality reporting forms are used. The form should be completely filled out, and the cardboard copy should be placed in the cage cardholder or otherwise secured to the cage/tank/pen to identify the animal. The remaining 2 paper sheets should be turned in to the Compliance and Training Managers' office (ARC 2.218). If the animal appears to be in immediate need of attention, the Compliance and Training Manager should be contacted directly by calling the number(s) posted in the facility. If that manager is not available, a veterinarian or the Facilities Manager should be notified. Emergency contact information is available on the voice mail system of the main ARC number (471-7534). On weekends, contact the on-call manager listed on the ground floor ARC message board.

7. *Reporting for satellite locations (e.g., fish or frog colonies in other locations).* Each satellite should have a plan to assure prompt reporting of animal health-related issues to a knowledgeable person who has authority to make decisions and access to the appropriate means of alleviating pain or distress. In some cases, the investigator or trained staff may be experts in the care of particular species. However, unless specific action plans are pre-approved in an IACUC-approved animal care and use protocol, the attending veterinarian must be notified whenever animals are receiving medical care due to illness or injury.

4/13/07

Animal Resourc Center
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Date: 4/4/07

To: Principal Investigators Using Animals in Research

From: Glen Otto, DVM, Director of the Animal Resources Center

Subject: World Laboratory Animal Liberation Week

This year's World Laboratory Animal Liberation Week (also known as World Week for Animals in Laboratories; WWAIL) is being observed from April 22-28. At this time, the plan for organized anti-animal research activities in Austin is not completely clear, but the UT student organization Students Against Cruelty to Animals (SACA) has been listed as a participant in the week's activities in previous years. It is safe to assume that there will be banner displays and/or protest marches in the Dean Keaton/Speedway areas of campus, and possibly a booth on the Mall.

During this time, be cautious of telephone calls from individuals representing scientific organizations or television or newspaper agencies. While UT encourages its faculty to freely discuss issues with the media, this is one situation in which you may want to consider referring reporters' calls to our professionals in media relations in the Office of Public Affairs. Laboratory animal use can be a very emotional issue, and as such, a third party sometimes is in the best position to dispassionately defend your efforts to advance science with the help of laboratory animals. Alternatively, you can let that office help you verify the authenticity of the reporter's claims regarding representation before you engage with the caller.

The Office of Public Affairs can also assist you with preparing for media interviews. Discussing potential questions from the media in advance can prevent many opportunities for misstatement and misinterpretation. Media experts strongly recommend that laboratories using animals prepare and keep on hand brief statements regarding the benefit to human and animal health of their ongoing experimental studies.

Although it is unlikely that anything other than peaceful demonstrations will occur, there has been a disturbing trend of more violent rhetoric on the part of extremist animal rights spokespersons during the past few years, both nationally and internationally. The 2006 federal convictions of a group of high-profile anti-research extremists and their

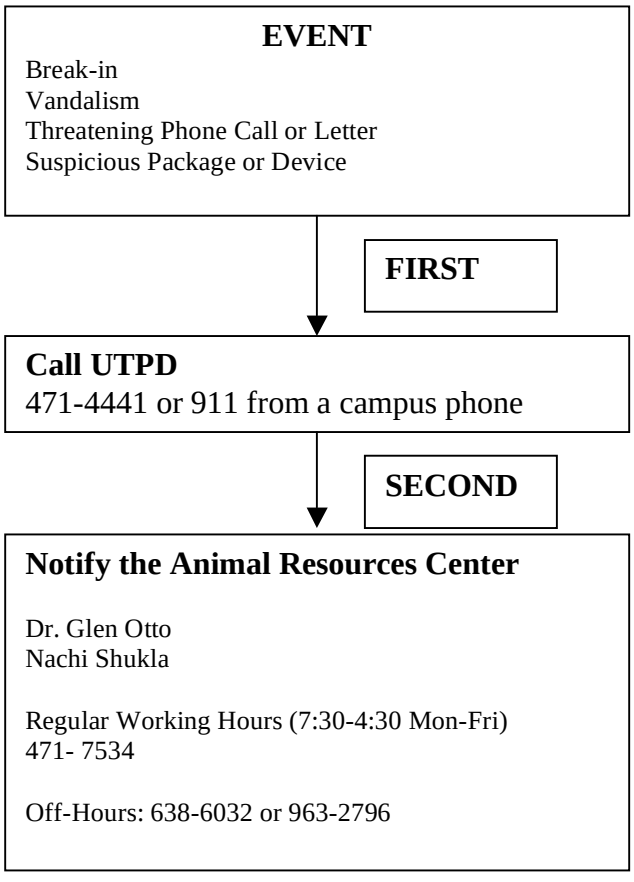
organization (the SHAC 7) and the recent amendments strengthening the federal Animal Enterprise Terrorism Act were significant positive advances in the battle to protect legal biomedical research, but there have been calls from other extremist groups for direct action (e.g., break-ins, property damage, etc.) as a response.

The action tree below should be used if any violence or threatened violence occurs. It's quite simple: notify the UT police department first, and then notify the Animal Resources Center. The ARC will take care of notifying University media relations, government relations, research administration, and any other relevant agencies. Please disseminate this information to personnel in your laboratories.

This is also an opportune time to warn each of you to be particularly alert for less obvious activities of the animal rights groups, including those from off campus. Universities are being increasingly targeted by undercover activists, who apply for work in animal research support positions in an effort to infiltrate and "expose" active research projects.

If you have any questions regarding the media or WWAIL issues, you can contact Glen Otto, Director, Animal Resource Center, at 471-2392 or Robin Gerrow, Director of Public Affairs, at 232-2145.

EMERGENCY NOTIFICATION



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IACUC Training Requirements

IACUC requires personnel to complete three specific steps for protocols to be approved:

Step 1. Laboratory Animal Training Association (LATA) Web-based Training Modules

This online training program was developed by LATA to provide you with required information on the humane care and use of lab animals as mandated by federal regulations. Researchers submitting IACUC protocols are required to complete this training every three years. All researchers must complete the basic "**The Humane Care and Use of Animals**" course. In addition to the basic "Humane Care and Use of Animal" course, species-specific training is *required* if available for the species in use.

To access the modules, visit LATA's **Online Training Program Introduction** . When prompted enter the user id *utaustin* and the password *bell*. Don't forget to enter your UT EID to receive credit for your coursework.

Species-specific Modules:

The Humane Care and Use of the Laboratory Rat
The Humane Care and Use of the Laboratory Mouse
The Humane Care and Use of the Laboratory Hamster
The Humane Care and Use of the Laboratory Guinea Pig
The Humane Care and Use of the Laboratory Rabbit
The Humane Care and Use of the Laboratory Goat
The Humane Care and Use of the Laboratory Dog
The Humane Care and Use of the Laboratory Cat
The Humane Care and Use of Nonhuman Primates
The Humane Care and Use of Laboratory Swine
The Humane Care and Use of Laboratory Fish

Additional Training Modules:

Aseptic Surgery of Rodents
Anesthesia and Analgesia of Rodents
Occupational Health and Safety

Step 2. ARC Orientation Class:

This class is an orientation to the Policies and Procedures for Animals Research at The University of Texas at Austin. It is given to researchers and management staff, by the Director of Animal Resource Center. The IACUC requires this class to be taken at least every three years. It is held monthly and individuals can enroll through TXCLASS (Class ID: AN1). The topics covered include:

- Contact information and organizational structure of the ARC and other relevant University departments
- University guidelines for humane animal care and use.
- IACUC functions and procedures
- Animal-related risks: zoonotic diseases and allergies
- Reporting procedure for animal care and use concerns.

To register, visit **TXCLASS** [UT EID required]. To find the next available class, click on "Class Listing" on the left side of the page. Select "AN" from the drop down menu and click on the "Go" button. Search for the course "AN1." To enroll, click on the start date and scroll down to where you see "Enroll/Withdraw." TXCLASS will automatically send a reminder email the day before the class to the email address associated with your UT EID. Please contact Jennifer Cassaday at 471-3909 for more information about this

course.

Step 3: Enrollment in the Laboratory Animal Occupational Health Program (LAOHP):

To enroll, complete the initial risk assessment **questionnaire** and submit it to the main office of the ARC. The questionnaire can be submitted in a sealed envelope to ensure privacy, if the following information is written on the outside: Name, EID and email address of the individual; Name of the responsible PI; Date; and the notation "LAOHP." Medical providers will evaluate the forms and determine what follow-up is required on a case-by-case basis. Once enrolled, individuals will need to submit a periodic health and risk status update **form** every three years (or annually if particular risks, such as primate exposure, are involved).