

Comparative Medicine



Provide general facility and program orientation so that protocol-specific, and/or species-specific training needs or services can be identified, ensured and/or arranged.

<https://www.usf.edu/research-innovation/research-support/comparative-medicine/>

IACUC Certification of Personnel

- Personnel who work with animals must be certified by the IACUC as having adequate knowledge and experience to perform their duties.
- Four (4) documents are used to document your knowledge and experience and are uploaded to your ARC personnel profile.
- Additional documents are uploaded to your ARC profile if you:
 - Are planning to use rodents, and/or
 - Are planning to conduct aseptic surgery, and/or
 - Are planning to use immunodeficient mouse strains
 - Are planning use of physical methods of euthanasia without anesthesia
- Protocol and species-specific technical assistance and training are always available by contacting the facility supervisor.



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IACUC Certification of Personnel

- ARC registration is completed at <https://ARC.research.usf.edu/prod/>
- Questions regarding ARC = help desk at 974-2880 and RSCH-arc@usf.edu
- A minimum of Four (4) Documents, but as many as Eight (8) Documents depending on research interests (discussed in subsequent slides) are Uploaded to your ARC Personnel Profile
 1. Health and Risk Assessment – reviewed annually
 2. Facility Orientation
 3. Certificate of AALAS Training – every 6 years
 4. Curriculum Vitae
- IACUC coordinators validate document uploads.
- IACUC certified personnel must have their PI add them to an approved protocol prior to the facility supervisor ensuring facility access

<https://www.usf.edu/research-innovation/research-support/research-integrity-compliance/iacuc/certification.aspx>

IACUC Certification of Personnel

Upload additional documentation to your ARC personnel profile (i.e., certificate(s) of training arranged by compmed@usf.edu), if you have/are:

5. Planning to use rodents = “Basic Rodent Use Biomethodology”
6. Planning survival surgery = “Aseptic Surgical Technique”
7. Planning use of immunodeficient strains = “Use of Immunodeficient Mice”
8. Planning use of physical methods of euthanasia without benefit of anesthesia = “Physical Methods of Euthanasia Without Anesthesia”

Protocol & species-specific technical assistance and training are always available by contacting the facility supervisor.

<http://www.usf.edu/research-innovation/comparative-medicine/technical-training-resources.aspx>



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Occupational Health & Safety

Health & Safety in the Care and Use of Animals

Occupational health & safety principles require a risk assessment so that personnel know the hazards associated with their work, understand how these hazards are controlled, utilize safe practices, and use protective supplies and equipment.

In general:

1. Human allergens are produced by furred animals (e.g., including $\alpha_2\mu$ -globulins in urine of rodents, and in saliva and dander of cats), which are airborne and penetrate lower airways, resulting in allergic symptoms in at risk personnel (e.g., respiratory symptoms, rash, hives, or anaphylaxis).
2. Tetanus immunization status should be current, since puncture wounds from sharps or bites, even from rodents, can develop complications.
3. Hepatitis B immunization status should be current, when work involves risk of exposure to human blood borne pathogens (e.g., use of human blood, or use of primary patient-derived tumor resections or cells).
4. Other health care services are required, when research involves unvaccinated or uncharacterized carnivores, pregnant sheep, goats, or nonhuman primates.

Institutional occupational health & safety contacts:

USF Health Administration 974-3163; Haley VAH Health 972-2000



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Documentation of Training

Institutions receiving federal funds in support of research involving animals must document personnel training in:

1. Animal care and use legislation,
2. IACUC function,
3. Ethics of animal use,
4. Concept of the “Three-Rs” (i.e., reduce, refine, replace animal use),
5. Methods for reporting concerns about animal use,
6. Occupational health & safety issues pertaining to animal care & use,
7. Animal handling,
8. Aseptic surgical technique,
9. Anesthesia & analgesia,
10. Euthanasia.

AALAS Learning Library is used to document training <https://www.aalaslearninglibrary.org/>

Upload an AALAS certificate of the module entitled "Laws, Regulations, Policies, and the Guide - USF Orientation"

AALAS account requested from IACUC@research.usf.edu

Documentation of Experience Using Animals

Document your experience working with animals in your ARC Personnel Profile:

1. Personnel with a history of work with a species, documented by peer-reviewed research involving the species, upload their curriculum vitae to ARC to document their experience.
2. Personnel, other than the PI, planning to use rodents must upload a certificate of completion of hands-on “In-Person” training in “Basic Rodent Biomethodology” scheduled by compmed@usf.edu
 - a. Identification (e.g., tail tattoo, ear tag or punch), cage card with protocol #
 - b. Behavior, health assessments, clinical end points (e.g., hunched, matted, inactive, isolated)
 - c. Handling & restraint
 - d. Breeding, weaning, sexing progeny
 - e. Substance administration (i.e., subcutaneous (SC) & intraperitoneal (IP) injections, oral (PO) gavage)
 - f. Blood collection (i.e., submandibular, saphenous, cardiac) methods & supplies
 - g. Euthanasia (e.g., inhalation of carbon dioxide followed by a physical method)

<https://www.usf.edu/research-innovation/research-support/comparative-medicine/technical-training.aspx>

Protocol & species-specific technical assistance and training are always available by contacting the facility supervisor.

Documentation of Aseptic Surgery Training

Personnel intending to contribute to survival surgical procedures must upload to ARC:

1. An AALAS certificate of completion of the module entitled “Aseptic Technique in Rodent Survival Surgical Procedures”
2. A certificate of “In-Person” training in such procedures provided by compmed@usf.edu
 - a. Asepsis
 - b. Gentle tissue handling
 - c. Minimal dissection of tissue
 - d. Appropriate use of instruments
 - e. Effective hemostasis
 - f. Correct use of suture materials & patterns.

Completion of the AALAS module is required prior to “wet lab” training attendance.

For assistance with the AALAS Learning Library use contact IACUC@research.usf.edu

<http://www.usf.edu/research-innovation/research-support/comparative-medicine/index.aspx>

Documentation of Immune Deficient Strain Use Training

Personnel intending to use immunodeficient mouse strains must upload to ARC:

1. An AALAS certificate of completion of the module entitled “Handling & Use of Immune Deficient Mice”
2. A certificate of “In-Person” training in such procedures provided by compmed@usf.edu
 - a. Working first in isolation
 - b. Equipment & supplies dedicated to isolation
 - c. Biologics characterized free of infectious agents
 - d. Additional PPE required
 - e. Surfaces are saturate sprayed with OxivirTB
 - f. A two-person-transfer procedure is used for introducing supplies & equipment.

Completion of the AALAS module is required prior to “wet lab” training attendance.

For assistance with AALAS Learning Library use contact IACUC@research.usf.edu

<http://www.usf.edu/research-innovation/research-support/comparative-medicine/technical-training.aspx>



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Documentation of Physical Methods of Euthanasia Training

Personnel intending to use physical methods of euthanasia without benefit of anesthesia (e.g., cervical dislocation, decapitation) must upload to ARC a certificate of completion of training entitled “Physical Methods of Euthanasia Without Anesthesia” arranged by contacting compmed@usf.edu

<https://www.usf.edu/research-innovation/research-support/comparative-medicine/technical-training.aspx>

Protocol & species-specific technical assistance and training are always available by contacting the facility supervisor.

Animals Orders, Supply & Equipment Requests

1. Animal order forms are submitted to animalorders@usf.edu by Thursdays at 11am for animals to arrive the following week from an approved vendor, either the Jackson Laboratories, Charles River Laboratories, Envigo, or Taconic

<https://www.usf.edu/research-innovation/research-support/comparative-medicine/procedures-forms.aspx>

Animal acclimation for 7 days is recommended before animal use

2. Requesting controlled substances for use in research involving animals (e.g., anesthetics, analgesics) is made via institutional DEA registrations (i.e., Schedule I & Schedule II-V) by first registering the Principal Investigator using a “Certification of Research Personnel Using Controlled Substances” form submitted to compmed@usf.edu

<https://www.usf.edu/research-innovation/research-support/comparative-medicine/documents/cmdc/c021-certification-controlled-substances.pdf>

3. Medical and surgical supplies can be purchased or ordered from the facility supervisor.

4. Equipment or procedural room reservations can be made by contacting the facility supervisor.

5. Technical services, including substance administrations, tissue derivations, surgical procedures or colony management, are available and charged-back monthly to grant accounts at an hourly rate.

<https://www.usf.edu/research-innovation/research-support/comparative-medicine/documents/cmdc/c017-services-per-diems-equip-fees.pdf>



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Animal, Supply, Equipment & Invoicing Contacts

1. Animal orders for procurement from approved vendors, contact animalorders@usf.edu Beth Aleo at baleo@usf.edu or 974-3844.
2. Animal importations from academic, research, or other sources, use the “request to receive animals from another institution” form viewable at <https://www.usf.edu/research-innovation/research-support/comparative-medicine/documents/cmdc/c003-req-to-receive-animals-other-institution.pdf> and contact Marta Perez at molivero@usf.edu.
3. Requesting controlled substances, contact your Facility Manager.
4. Medical and surgical supplies or equipment or technical assistance, contact the facility manager.
(MDD, CAMLS) Crystal Reed, BS, LATG, at cmreed2@usf.edu or 396-0141
(ALZ, RSB, PCD, IDRB, BPB) Ana Almonte, ALAT at almonte@usf.edu or 396-0612
(MDC, CPH) Crystal Rivera, LATG at crystalr2@usf.edu or 974-3836
5. Monthly charges invoiced to grant accounts, contact accountants:
Everett White at ewhite@usf.edu or 974-5221
Rosemarie Louis-Charles at remcharles@usf.edu or 974-8117

Services, Equipment, Room Reservations

- Per diems and technical assistance rates are viewable at:
<http://www.usf.edu/research-innovation/research-support/comparative-medicine/orders-service-requests.aspx>
- There is no charge for the use of most portable equipment and all procedural space within animal facilities. Contact the facility supervisor to arrange technical assistance or to reserve equipment or rooms in advance.
- There is no charge for portable equipment use, including use of microscopes, anesthesia machines, scales, calipers, hot water blankets, centrifuges, ventilators, electro-cautery, pulse oximeters, capnographs, and blood pressure monitors.
- Oxygen tanks on anesthesia machines, and carbon dioxide in necropsy are provided without charge.
- Hematology and serum chemistry analyzers are available at technical assistance rates plus costs of supplies.

Reporting Animal Welfare Concerns

Reporting concerns, deficiencies, or observations made regarding the adequacy or appropriateness of the facilities, program, principles, or procedures contributes to the oversight, development, and improvement of the program for animal care and use and contributes to the resolution of the concern or deficiency.

Deficiencies in animal care, use, recordkeeping, or treatment, and adverse events in animal care or use can be reported to Comparative Medicine veterinarians (745-4361, 745-5923, 974-3673, 974-5092), or administrative staff (974-9842, 947-9876), or to the IACUC c/o Research Integrity & Compliance (974-0954, 974-5110, 974-7106), or directly to the IACUC Chairperson (974-1547), or IACUC Vice Chairperson (745-1540), or to the Institutional Official of the Animal Care and Use Program, (974-5570).

This reporting-feedback mechanism of observations made regarding the practices of animal care and use within these facilities, contributes an important oversight, assists in the continuous development of the animal program, and includes a mechanism for anonymity viewable at ethics point:

<https://secure.ethicspoint.com/domain/media/en/gui/14773/index.html?locationid=-1>

Prior to Entering the Facility (Don PPE)

Successful research outcomes involving animals require appropriate handling and use techniques that guard against infections that invalidate studies. Even subclinical infectious exposures can invalidate research data by altering normative biological responses.

To enter a facility, don a disposable lab coat and shoe covers. Disposable gloves and Tyvek sleeves are also available in gowning at facility entrances and are required when handling animals.



Prior to entering Common procedural areas

When working in common procedural areas

- a. In addition to the disposable gown and shoe covers donned upon entrance to the facility or when handling animals or caging, a bouffant and surgical mask that covers the nose are required to enter a common procedural area.
- b. Upon entering the procedural area push your thumb through the sleeve of the gown and put on a pair of gloves ensuring the cuffs overlap the gown, and don Tyvek sleeves.
- c. If working with immunodeficient mice put on an additional pair of gloves ensuring gloves overlap sleeves and no skin is exposed.
- d. Gloved hands are then disinfected by saturate spraying with Oxivir TB



Prior to Handling Animals (PPE + Surface Decontamination)

Disposable gloves and Tyvek sleeves are required and decontaminated by saturate spraying with OxivirTb before handling animals.



Before animal use, decontaminate your gloves, Tyvek sleeves, and the surfaces of your work area, portable equipment, and the exterior of the microisolator in advance of animal use by saturate spraying with OxivirTB. A bouffant and mask are required.



Microisolators should be opened under a class 2A2 biological safety cabinet in isolation or containment, and otherwise within a transfer station.

Prior to Entering Isolation (Additional PPE & Procedures)

Prior to using immunodeficient mouse strains additional AALAS didactic & wet lab training provided by compmed@usf.edu is documented in ARC. This training ensures use of additional required PPE and decontaminating procedures.

Once training is documented, work in isolation first, dedicate equipment & supplies to isolation, and use a two-person-transfer procedure to introduce new supplies & equipment into isolation.



Animal Medical Recordkeeping

Adequate animal care includes adequate medical recordkeeping.

Researchers serve as the primary attending clinicians of animals housed on their behalf. A veterinarian is always available to assist.

As such, researchers are responsible for maintaining animal medical records with entries made in sufficient detail and at intervals specified in IACUC Principles XIX.1-16 and SOP 12 entitled “Animal Medical Records for Nonrodent Mammals”, and SOP 412 entitled “Rodent Surgery”.

Entries describing survival surgical procedures in any species must be kept by researchers in the animal facility, on a “Surgical Record” form, a “Record of General Anesthesia” form, or a “Rodent Surgery Procedural Record” form.

Preemptive and post-operative analgesia must be recorded.

Forms are available at [://www.usf.edu/research-innovation/research-support/comparative-medicine/animal-medical-recordkeeping.aspx](http://www.usf.edu/research-innovation/research-support/comparative-medicine/animal-medical-recordkeeping.aspx)

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Rodent Surgery/Procedural Record
Page ____ of ____

Date: _____ Protocol #: _____ Arrival Date: _____ Facility/Room #: _____
Investigator: _____ Species: _____ Procedure: _____
Surgeon(s): _____ Anesthetist(s): _____ Survival or Non-survival (circle one)
Anesthetic Plan: (agent(s), concentration, dose, route) _____
Analgesic Plan: (agent(s), dose, route) _____
Pre-operative assessment: (date, condition) _____ Emergency Contact Phone #: _____

USF ID	GroupID	Weight (g)	Surgeon	Analgesic (mg/kg)	Induction/Recovery (min)	Comments: (date & immediate post-procedural assessments, complications, supplemental analgesia, date of discharge, etc.)
				/	/	
				/	/	
				/	/	
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Post-Operative Plan & Care
Observation / Treatment Dates:

Date	Analgesic (time & interval)	Comments
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	/	

CMDC #139.2
EFF 4/12

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Record of General Anesthesia
Page ____ of ____

Principal Investigator: _____ IACUC#: _____ USF ID (page tattoo): _____ USF ID #: _____
Date of Pre-procedural Assessment: _____ Body Weight: _____ Technician: _____

General Pre-procedural Condition: _____
Planned Procedure: _____ Fasting: _____
Anesthetic Plan: dosage (mg/kg) X body weight (kg) = dose (mg) / dilution (mg/ml) = volume administered (ml)
1. Anticholinergic
2. Tranquilizer Sedative Preanesthetic
3. Induction
4. General Anesthetic
5. Analgesic
6. Antibiotic

Date of Procedure: _____ Director of Procedure: _____ Assisting Technician: _____
Time Preanesthetics Administered: _____ Time of Induction: _____ Time of Procedure: _____
IV Fluids Administered: _____ Other Medications: _____

	Time	HR	RR	CRF	Pulse Characteristics	Body Temperature	Other
Preprocedure							
Intraprocedure							
Postprocedure							

Procedure: _____

Time of Procedure Completion: _____ Time When Sternum Recumbent: _____
Observations, Treatments, Plan: _____

CMDC #136.1
Effective 5/14

Use Characterized Biologics, In Date Sterile Preparations, USP Grade Pharmaceuticals, & Decontaminated All Surfaces

- Biologics (e.g., tumor-derived cell lines), especially those originally derived from, or serially passaged-through rodents, have the potential to surreptitiously transmit rodent pathogenic agents.
- Documentation of biologics as pathogen-free is accomplished by providing an aliquot (e.g., cell line) to the facility supervisor for PCR testing.
- In date USP grade pharmaceuticals must be used whenever available.
- Sterile multi-dose preparations (e.g., intravenous fluids, drug dilutions) must be dated when opened/prepared and are considered expired 28 days later.
- Decontaminate the exterior of the microisolator, supplies, instruments, equipment, and procedural surfaces prior to and following each use by saturate spraying with Oxivir Tb.
- Leave empty soiled microisolators clamped shut in housing or use rooms and care staff will collect such cages and deliver to soiled cage wash for cleaning.

Animal Health Surveillance

- Surveillance of animal health by staff occurs twice daily, with concerns recorded and resolved jointly by care and research staff in accordance with SOP 006 entitled “Animal Health and Environmental Surveillance”.
- Rodent pathogens are excluded, and opportunists are monitored in facilities in accordance with SOP 411 entitled “Rodent Quarantine” and SOP 409 “Exhaust Air Dust (EAD) Rodent Health Surveillance”.
- Rodent importations are received into quarantine for testing, treatment, and when excluded agents are detected, rederivation, a process requiring 3-8 weeks, arranged by submitting the “Request to Receive Animals From Another Institution” form viewable at <http://www.usf.edu/research-innovation/research-support/comparative-medicine/import-export-transport.aspx>

Animal Health Surveillance(Flags)

- If an animal health concern is observed, staff flag the primary enclosure with a **red cage card** identifying the animal, the concern, and the date the concern was first noticed, and record the concern on the housing room's Progress Notes form.
- Rodent microisolator card colors are used as flags to indicate
 - **Red = Health concern** (delineating treatment or monitoring plan);
 - **Neon Orange = Approaching or at clinical endpoint**
 - **Neon Pink = Research related special instructions** (i.e., special diets, special water, DMSO, diabetic, clip teeth);
 - **Light Blue = Breeding Instructions** (breeding, separate pregnant female, check for litter, pups in cage);
 - **Navy Blue = Check for copulatory plug**;
 - **Neon Green = Pup manipulations** (identification/genotyping, wean);
 - **Light Pink = Cross Foster**;
 - **Neon Yellow = Euthanize**;
 - **Orange = Containment** (e.g., recombinant DNA, animal biosafety);
 - **White = Caretaker Status**

Husbandry, Relocation, Reassignment, & Exportation

- Animal care staff change individually ventilated cages (IVC) every other week, water bottles on IVC weekly, and static cages twice weekly. Housing and use rooms are vaporized hydrogen peroxide (VHP) decontaminated every 6 months.
- Weaning by care staff occurs when rodents are between 18-21 days of age. All CM or PI weaned animals must be weaned into social housing groups of the same gender. If there is only one weanling of the opposite sex in a litter please write on the cage card “only male in weaned litter” for single males or “only female in litter” for single females.
- Movement of animals to other housing rooms or facilities is requested in writing using a “Request to Relocate &/or Reassign Research Animals” form and accomplished by care staff; forms are viewable at <http://www.usf.edu/research-innovation/research-support/comparative-medicine/import-export-transport.aspx>
- Animals are eligible for transfer from one IACUC-approved research use to another if they are naïve with respect to uses, and requested using a “Request to Relocate &/or Reassign Research Animals” form viewable at <http://www.usf.edu/research-innovation/research-support/comparative-medicine/import-export-transport.aspx>
- The export shipment of animals to other institutions is requested in writing using a “Request to Ship Animals to Another Institution” form viewable at <http://www.usf.edu/research-innovation/research-support/comparative-medicine/import-export-transport.aspx>

Rodent Euthanasia using Carbon Dioxide Inhalation

- Animals found dead are placed in the necropsy refrigerator and the PI is notified that carcasses will be held for 48 hours. Carcass disposal freezers are located either in or near necropsy in each facility.
- Carbon dioxide euthanasia is in accordance with SOP 401 viewable at: <http://www.usf.edu/research-innovation/research-support/comparative-medicine/documents/sops/s401-co2-euthanasia-in-rodent-species.pdf>
- Cages of rodents should not be combined for the purpose of euthanasia. Whenever possible, rodents should be euthanized in their home cage.
- CO₂ is delivered at a flow rate that displaces 10-30% of the cage volume/minute, consequently the gas flow setting is cage size dependent (i.e., indicated by SC #089 on the tank regulator).
- Death must be verified by a secondary method of euthanasia (i.e. cervical dislocation, decapitation, bilateral thoracotomy) or observation in room air for at least 10 minutes. Neonates are resistant to CO₂ euthanasia. CO₂ inhalation induces anesthesia in neonates and must be followed by a (i.e. decapitation).

RODENT EUTHANASIA BY CO₂ INHALATION
IS PERFORMED BY USING GRADUALLY
INCREASING CONCENTRATIONS OF CO₂
AT RATES INDICATED BELOW:

Species	Cage Type	Flow Rate L/min
Mice	Static (small)	4
	IVC (w/o lid)	4
	IVC (w/ lid)	6
Rat	Static	10
	IVC (w/o lid)	10
	IVC (w/ lid)	10

SC #089.4
Eff. 2/20



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Other Helpful Information

- Care staff are present in facilities between 7:00 am - 3:00 pm Monday – Friday
- Facility access cards should not be shared or used to grant others access
- No eating or drinking in the animal facility
- Facility tour will also demonstrate: (1) evacuation routes, (2) location of fire extinguishers, (3) location of emergency eye wash & safety shower, (4) SDS location, (5) facility access points (after hour/weekend access for College of Medicine facility)
- Comparative Medicine Website <http://www.usf.edu/research-innovation/research-support/comparative-medicine>
- IACUC Website <http://www.usf.edu/research-innovation/research-support/research-integrity-compliance/iacuc/index.aspx>
- IACUC Principles and Procedures <http://www.usf.edu/research-innovation/research-support/research-integrity-compliance/documents/iacuc/iacuc-policies.pdf>
- Current Topic in Animal Care and Use <http://www.usf.edu/research-innovation/research-support/research-integrity-compliance/iacuc/announcements.aspx>
- AWA-<http://www.aphis.usda.gov/animal-care/awa-services>
- AVMA-[Guidelines-on-Euthanasia-2020.pdf](#) (avma.org)
- NIH/OLAW-[Grants & Funding | National Institutes of Health \(NIH\)](#)

Comparative Medicine Contacts

Veterinarians

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