

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**.

<http://www.usf.edu/research-innovation/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.

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**

<http://www.research.usf.edu/dric/iacuc/certification-personnel.asp>



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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 Biotechnology”
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>

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; Moffitt Health Services 745-2487; Haley VAH Health 972-2000

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)

<http://www.research.usf.edu/cm/subpages/technical-training-resources.asp>

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/comparative-medicine/technical-training-resources.aspx>



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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/comparative-medicine/technical-training-resources.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

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

<http://www.usf.edu/research-innovation/comparative-medicine/purchasing-per-diems.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 lgraham@usf.edu or telephone 974-9876 or fax 974-9432

<http://www.usf.edu/research-innovation/comparative-medicine/dea-controlled-substances.aspx>

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.

<http://www.usf.edu/research-innovation/comparative-medicine/purchasing-per-diems.aspx>

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 <http://www.usf.edu/research-innovation/comparative-medicine/shipping-relocating.aspx> and contact Lloyd Graham at lgraham@usf.edu or 974-9876.
3. Requesting **controlled substances**, contact Lloyd Graham at lgraham@usf.edu or 974-9876.
4. Medical and surgical **supplies** or **equipment** or **technical assistance**, contact the facility supervisor.
(**SRB**) Christine Perry, AS, RLATG, CVT at christine.perry@moffitt.org or 745-4320
(**ALZ, CPH, PCD, IDRB, BPB**) Ana Almonte, ALAT at almonte@usf.edu or 396-0601
(**COM,**) Marta Perez, RN, LATG, molivero@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/comparative-medicine/purchasing-per-diems.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 **rodent postoperative** monitoring, record keeping, and **analgesic administrations** made during normal working hours, when requested of the facility supervisor 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.
- Contact the Small Animal Imaging Lab (**SAIL**) staff for **imaging rates and services**, viewable at <https://moffitt.org/research-science/shared-resources/small-animal-imaging-lab/>

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/en/report_custom.asp?clientid=14773

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 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/comparative-mhttpedicine/animal-medical-recordkeeping.aspx](http://www.usf.edu/research-innovation/comparative-mhttpedicine/animal-medical-recordkeeping.aspx)

The image displays two forms from the University of South Florida's Division of Comparative Medicine. The top form is the 'Rodent Surgery/Procedural Record' (Page ___ of ___), which includes fields for Date, Protocol #, Animal Date, Facility/Room #, Investigator, Species, Procedure, Surgeon(s), Anesthesia(s), Anesthetic Plan (agent(s), concentration, dose, route), Analgesic Plan (agent(s), dose, route), and Emergency Contact Phone #. It features a table for recording analgesic and anesthetic administration with columns for USF ID, Group ID, Weight (g), Surgeon, Analgesic (agent/dose), and Induction/Recovery (time). A 'Comments' section is provided for notes on anesthesia, analgesia, and post-procedural care.

The bottom form is the 'Record of General Anesthesia' (Page ___ of ___), which includes fields for Principal Investigator, IACUC#, USDA ID (tag/tattoo), USF ID#, Date of Pre-procedural Assessment, Body Weight, and Technician. It contains sections for 'General Pre-procedural Condition', 'Planned Procedure', 'Fasting', 'Anesthetic Plan' (with a formula: dose (mg/kg) X body weight (kg) = dose (mg) / dilution (mg/ml) = volume administered (ml)), and a list of administered agents: 1. Anticholinergic, 2. Tranquilizer/Sedative/Preanesthetic, 3. Inductant, 4. General Anesthetic, 5. Analgesic, and 6. Antibiotic. It also includes fields for Date of Procedure, Director of Procedure, and Assisting Technician, as well as timing for Preanesthetics, Induction, and Procedure. A table tracks IV Fluids and Other Medications, and another table tracks Pre-procedure, Intra-procedure, and Post-procedure vital signs (Time, HR, RR, CRT, Pulse Characteristics, Body Temperature, Other). A 'Procedure' section is provided for detailed notes. The form concludes with fields for Time of Procedure Completion, Time When Animal Recovers, and Observations/Treatments/Plan.

Both forms include reference numbers: CMDC #130.2 EFF 4/12 and CMDC #126.1 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”.
- 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 **pathogens are excluded**, and **opportunists are monitored** in facilities in accordance with SOP 411 entitled “Rodent Quarantine” and SOP 410 “Sentinel Rodent Health Surveillance”.
- Rodent **importations** are made to 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/comparative-medicine/shipping-relocating.aspx>
- 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, check for plug, separate pregnant female, check for litter, pups in cage); **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.
- **Movement of animals** to other housing rooms or facilities is requested in writing using a “**Request to Relocate Research Animals**” form and accomplished by care staff; forms are viewable at <http://www.usf.edu/research-innovation/comparative-medicine/shipping-relocating.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 Reassign Research Animals**” form viewable at <http://www.usf.edu/research-innovation/comparative-medicine/shipping-relocating.aspx>
- Reassignment of naïve mice from a **murine colony to a research protocol** is accomplished by notifying the facility supervisor.
- The **export shipment** of animals to other institutions is requested in writing using forms viewable at <http://www.usf.edu/research-innovation/comparative-medicine/shipping-relocating.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/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 physical method of euthanasia (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)	2
	Static (large)	6
	IVC (w/o lid)	3
	IVC (w/ lid)	4
Rat	Static	8
	IVC (w/o lid)	11
	IVC (w/ lid)	13

SC#089.3
Eff. 6/13



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Other Helpful Information

- Care staff are present in facilities between 7:00 am - 3:30 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.research.usf.edu/cm/comparative-medicine.asp>
- IACUC Website <http://www.research.usf.edu/dric/iacuc/>
- IACUC Principles and Procedures <http://www3.research.usf.edu/dric/iacuc/docs/IACUCPolicies.pdf>
- Current Topic in Animal Care and Use <http://www.research.usf.edu/dric/iacuc/announcements.asp>
- AWA-<http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/animalwelfare>
- IACUC-<http://www.iacuc.org/>
- AVMA-<https://www.avma.org/KB/Policies/Documents/euthanasia.pdf>
- NIH/OLAW-<http://grants.nih.gov/grants/olaw/olaw.htm>

Comparative Medicine Contacts

Veterinarians

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