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Division of Laboratory Animal Resources Mission Statement

MISSION:
The mission of the Division of Laboratory Animal resources is to provide animal care,
veterinary services, and technical services in support of biomedical research using vertebrate
animals. The Division is committed to humane animal care and compliance with all regulations
in support of the biomedical research mission of the University.

VISION:
The Division of Laboratory Animal Resources will be viewed as an essential and
valued component of the biomedical research enterprise by the faculty researchers at the
University of Kentucky and the unit will be considered among the top 25% of programs
regarding laboratory animal medicine, facility management, and laboratory animal research.

VALUES:
• The use of vertebrate laboratory animals is essential and appropriate for the
  conduct of scientifically valuable research relevant to human or animal health,
  the advancement of knowledge, or the good of society.
• Optimal animal care, health, and well-being are essential for valid leading edge
  biomedical research when laboratory animals are used.
• Personnel involved in the care and maintenance of animals are essential
  partners in, and valuable contributors to, the biomedical research enterprise.
• Comparative medical scientists are valuable contributors to the overall
  biomedical research effort at the University of Kentucky.
• Training and instruction in laboratory animal and comparative medicine is
  valuable and necessary for the continued rapid advancement of biomedical
  research using vertebrate animals.
Division of Laboratory animal Resources Veterinary Services and Husbandry/Support Services Staff

Bernard Doerning
MBA, DVM, DACLAM
Director

Jeanie Kincer
DVM, DACLAM
Assistant Director

Jeff Smiley
DVM, PhD DACLAM
Assistant Director

Cheryl Haughton
DVM, DACLAM
Sr. Clinical Veterinarian

Division of Laboratory Animal Resources Animal Care and Husbandry Supervisors

Toma Matott BA
Facility Op Manager
RLATg

Carolyn Bratcher
Supervisor
RLATg

Peggy Hances-Peña
Supervisor
RLATg

Kim Tomaschko
Supervisor
RLATg

Amer Hashem
Supervisor

Steve Tudor
Supervisor
ALAT

Raghda Abukhaled
Supervisor

JoeAnn Croxford
RLATg
Training Coordinator

Division of Laboratory Animal Resources Veterinary Health Care Technicians

Amelia Hall
RVT

Meggie Jackson
RVT

Bonnie Newcomb
RVT

Karianne Zamiar
RVT

Research Analysts

Glenn Florence
LATg

Jason Oakes
RLATg

Hollie van Rooyen
LATg

Wade Washington
LAT
HOW TO CONTACT US:

**Director:**
Bernard Doerning, MBA,DVM, DACLAM
Bernard.Doerning@uky.edu

**Assistant Director:**
Jeanie Kincer, DVM, DACLAM
jfkinc2@email.uky.edu

**Assistant Director:**
Jeffrey Smiley, DVM, Ph.D DACLAM
jsmil2@email.uky.edu

**Senior Clinical Veterinarian:**
Cheryl Haughton, DVM, DACLAM
cheryl.haughton@uky.edu

**Facilities Operations Manager:**
Toma Matott,BA, RLATg
toma.matott@uky.edu

**Experimental Surgery:**
Hollie van Rooyen, RLAT
hskuf2@email.uky.edu

**Animal Care and Husbandry Supervisors:**
Bio-Pharm, (Lee T. Todd Building)
Carolyn Bratcher
cbrat2@email.uky.edu

BBSRB, ERF, HKRB, Sanders Brown
Kim Tomaschko
mktoma2@email.uky.edu

Large Animals, Birds
NHP’s, MDSB
Steve Tudor
sjtudo1@email.uky.edu

**Med Center**
Supervisor
Peggy Hakes-Pena
ppena2@email.uky.edu

Central Animal Facility
Supervisor
Raghda AbuKhaled
raghda.abukhaled@uky.edu

Utility Worker Supervisor
Amer I Hashem
amer.hashem@uky.edu

**Administrative Staff/Business Officer**
Phillip McCann
ppmcca2@email.uky.edu

eSirius, Animal Requisitions, Census, Animal Transfers
Cheryl Carmichael
cspina@email.uky.edu

DLAR Personnel and Research Needs
Melissa Hammons
Missy.Hammons@uky.edu

**Animal Requisitions and Administrative Support Coordinator**
Donna Dailey
dldail4@email.uky.edu

Administrative Support
LoriAnn Lunsford
lori.lunsford@uky.edu

Training
JoeAnn Croxford
ejcrox2@uky.edu

Additional information and other useful resources can be found in the DLAR web page located at the following address: https://www.research.uky.edu/division-laboratory-animal-resources

**FACILITY ACCESS AND SECURITY PROTOCOLS**

Access to the DLAR animal facilities is limited to authorized personnel only. Authorized users must not “loan” their badges to others or allow others to use their credentials at the risk of having their access revoked. “Tail-gating” or following others into the facilities without swiping
your badge is not permitted. The DLAR facilities have a variety of security measures to enter a facility.

- **Med Center, Combs and HSRB** require badge and Iris Scan for facility entry and badge out of facility.
- **Lee T. Todd** (Bio Pharm) requires a badge and 5-digit PIN for facility entry, badge out of facility and badge to enter animal rooms.
- **Sanders Brown** requires badge and 5-digit PIN for facility entry and badge out of facility.
- **BBSRB** requires badge for facility entry and 4-digit PIN to enter animal housing rooms.
- **MDSB** requires a key for facility entry and 4-digit PIN to enter animal housing rooms
- **Spindletop** requires a key for facility entry.
- **HKRB** requires badge and Iris Scan for facility entry in and out of facility

Access to DLAR facilities can be obtained once someone is added to your protocol. All access requests go through the DLAR main office in HSRB 204. See instructions for facility access on the DLAR web page under forms: [https://www.research.uky.edu/division-laboratory-animal-resources/dlar-forms](https://www.research.uky.edu/division-laboratory-animal-resources/dlar-forms)

- The EyeLock enrollment for the iris scan is located in HSRB 204. The enrollment only takes a few minutes. Please schedule time for your enrollment by contacting the one of the staff in the main DLAR office (HSRB room 204): Donna at 323-5885 (dldail4@uky.edu), Lori Ann at 323-7132 (lori.lunsford@uky.edu) or Missy at 323-2934 (Missy.Hammons@uky.edu).
- PIN numbers for facility access and Lee T. Todd animal room access are assigned by the DLAR Main Office. The same 5-digit PIN will work for any of our facilities requiring a 5-digit PIN.
- **BBSRB and MDSB room entry 4-digit PINs are assigned by the area supervisor. The forms can be found on the DLAR web site [https://www.research.uky.edu/division-laboratory-animal-resources/dlar-forms](https://www.research.uky.edu/division-laboratory-animal-resources/dlar-forms)

**Temporary Badges**

Temporary badges are issued to visitors and vendors who will be here a short while (from a few hours to a day or two for equipment service). In order to access any DLAR facility, there needs to be a Visitor/Vendor Occupational Health form on file in DLAR. This information page is part of our overall occupational health and safety program to inform visitors and vendors of any potential exposure to allergen or other hazards that may or may not be encountered in an animal facility.

- Temporary badges are available in our main office in the Health Sciences Research Building (HSRB) Room 204 between the hours of 7:30 AM and 4:30 PM Monday through Friday.
- Temporary badges are also available in the BBSRB DLAR office (B036) and the Lee T. Todd Building DLAR office (030H) between the hours of 7:00 AM and 3:00 PM Monday through Friday
- For your convenience, this information is available by email. A link to request the information can be found on our webpage on the Frequently Asked Question page [https://www.research.uky.edu/division-laboratory-animal-resources/dlar-faq](https://www.research.uky.edu/division-laboratory-animal-resources/dlar-faq)
- Temporary badges have NO entry or room door access capabilities and are only valid for the day they are issued. If you require a temporary badge for more than one day, it must be renewed each day.
• Visitors/Vendors to our facilities must be escorted by their hosts or a member of the hosts’ staff or appropriate personnel.
• All photography must be with approval of the Director of the Division of Laboratory Animal Resources and the Principle Investigator.

Note: Media representatives must also be cleared and approved obtained through the Office of the Vice President for Research and UK Public Relations. Media representatives MUST be accompanied by a member of the DLAR staff or the Investigator staff. Should you need to make arrangements for your visitors ahead of time, please contact our Facility Manager, one of our DLAR veterinarians, our office staff, or our training coordinator.

Training
Training is available on a wide range of subjects by contacting our Training Coordinator, any of the DLAR Supervisors, or our DLAR Veterinarians. Basic micro-isolator techniques, working under the laminar airflow work stations and Biosafety cabinets, as well as animal handling, routine procedures such as oral gavage, injection and blood collection, are just a few of the techniques available. These can be scheduled as an individual or group session and can be arranged with our training coordinator. Additional techniques may be available on request. It is recommended that all new staff members attend a basic procedures training session. All personnel must participate in the Occupational Health and Safety program if they will be working with or around laboratory animals or their tissues. Please contact our Training Coordinator for more information on training opportunities for your staff.

DIVISION OF LABORATORY ANIMAL RESOURCES SUPPORT UNITS

Animal Husbandry and Support

Housing and Animal Facilities
The location of animal housing will be determined by DLAR with the consideration for the investigator and his/her needs. Space within the animal facilities may be limited at times, but every attempt will be made to work with the investigators to ensure adequate space. All animals must be housed in DLAR facilities unless special permission has been obtained from the Institutional Animal Care and Use Committee and the requirements for their care have been addressed. If you will be working with non-human primates, you will have to consult with the DLAR veterinary staff for the requirements for being granted access to this area. Additional training and current negative tuberculin testing and measles titer are required for all personnel.

Caging for Rodents
The majority of rodents housed in the DLAR facilities are in ventilated caging to maximize biosecurity at the cage level. These cages are changed under laminar airflow and Class II Biosafety cabinets facility wide. Any and all manipulations of caging and animals will be accomplished using the hoods. This will include changing cages, weaning, pairing for breeding, sexing of weanling, medical examination and treatment, and all procedures done within the animal housing areas. Prepared clean caging is available in the hallway. Should you need more than just a few cages for weaning or separating animals, please submit a request to the area supervisor using the Special Request form. Cages manipulated outside the hoods will be marked as
CONTAMINATED and should be handled last after all other animals have been manipulated.

Working in Rodent Rooms

All work with mice and rats must be done in the hoods. The micro-isolator lid should not be opened unless the cage is in the hood. Disinfect all work areas before and after use. Before placing a cage on the ventilated cage rack, check to ensure that a water valve is present and activate it to ensure that water is flowing from the water valve. When replacing a cage back into the ventilated cage rack, be sure that it is properly “docked” so that the animals can obtain water from the automated water lines and the water valve is not compromised.

![Activate the water valve with gloved hand to ensure water is flowing. You should see water dripping almost immediately.](image)

![No water valve in place](image)
![Water valve is in place and ready to use](image)

Be sure that the cage is pushed all the way back in order to provide air changes and water. If the cage is “sticking out” from the line of cages on the rack you should push it all the way back.

| Back | Front | NOT properly Docked | Properly docked |

* If you work with breeding colonies you must take special care when weaning pups. *

Food should be placed on the bottom of the weanling cage to ensure that they have food available. Young mice may sometimes not be able to bite off pieces of food from the food hopper since many of them feed from the bottom on pieces their parents break off. It may be necessary to place moistened food in the bottom of weanling mouse cages particularly if the weanlings are small. It is important to remember that weanling mice do not do well alone. They should always have a cage mate until they have acclimated to being on their own. Place a water bottle on the cage until they have learned to use the automated water valve. This could take a week or two and be sure to mark the cage with a newly weaned card so they can be monitored by the technicians.

If you, as an investigator will be caring for your animals, you will want to use a special transparency as an indicator in addition to the DLAR Service Request form that you will have filled out. These yellow transparencies are used to indicate that there is a special situation where an investigator has a specific study or sensitive project going on.

If you use the transparency with the corner removed, DLAR will only do a visual check to be sure the animals have food and water and only pull the cage if the animals appear to be in distress. You will be notified in this case.

Yellow transparencies with the right corner cut off = DLAR changes the cage but will not pull out the cage during room checks. DLAR is responsible for the husbandry of the cage, however, the PI does not want the cage pulled for observation.

Whole yellow transparencies over a cage card = DLAR will not pull out the cage during room checks and will not change the cage. The animals must be observed without disturbing the cage. Research staff is responsible for the husbandry of the cage.
If you use the transparency **without the corner removed**, you, as the investigator, are responsible for the husbandry of the cage.

**Micro isolator technique**
Micro-isolator technique is easily accomplished. There is a presentation on the DLAR webpage outlining the basics of good micro-isolator technique. This proven method of working with rodents is highly effective when used properly in the prevention or containment of murine pathogens. When used improperly or not at all, it jeopardizes not only the results or health of your colonies, but the health and study results of potentially the entire facility. Here are a few simple rules to follow when using micro-isolator technique.

- **Always** turn the hood or Biosafety cabinet on and allow it to run for a few minutes. This enables the air flow to begin to circulate properly.
- Be sure the shield is at the proper working height. An alarm will sound if not.

- **Always** wear a dedicated lab coat and sleeves and gloves, be sure that the cuffs of your sleeves are covered by the cuff of your gloves.

- **Always** wipe down the work surface with appropriate disinfectant.

- When using a “dip tray” be sure that you have fresh disinfectant in the tray so you can dip your fingers/hands when working between different cages of animals.

- Do not over fill the work surface or block the vents in the front of the cabinet.

- Wipe the work surface when you are finished your work with appropriate disinfectant followed by clean water. While sinks are not available in all animal rooms, the use of water from a **clean** water bottle is acceptable.

**Procedures in rodent housing rooms:**
This section is to provide guidance to investigators regarding performance of procedures in animal holding rooms versus designated vivarium procedure rooms.

DLAR animal rooms are primarily intended for animal housing. Husbandry and research procedures, as well as in-house transport of animals, can cause changes in physiological parameters such as heart rate, blood pressure, plasma corticosterone levels, and blood glucose levels. Providing stable, consistent environmental conditions in these rooms minimizes variability in research results and disruption of the animals' normal functions such as breeding and sleep patterns.

However, it is understood that both research procedures and husbandry tasks are necessary parts of the research enterprise. It is also difficult to determine if these physiologic changes are indicative of a negative impact on the animal since presumably “positive” stimuli can elicit some of the same responses as “negative” stimuli. In an effort to minimize these variables, the following recommendations are intended to provide guidance to researchers on performing these tasks in the vivarium.

Certain minor procedures may be performed in the animal housing rooms, such as injections, blood collection, tissue sampling for genotyping (e.g., tail biopsy, ear punching), and weighing.

However, procedures that may be harmful to other animals in the room such as the use of volatile chemicals, surgery, euthanasia or generation of excess noise, etc. may not be performed in animal housing rooms. Such activities should be done in procedure rooms which are available in DLAR for more complex, noxious, or time-consuming procedures.

In particular, when working with or around more sensitive species, such as rodents or rabbits, work quietly to avoid disturbing or distressing the animals. Any excessively distressing procedures, such as invasive or anesthetized blood collection or surgery, are to be done outside of the animal housing rooms, to avoid unnecessary stimulation of the animals.

Many DLAR facilities have associated procedure rooms. These rooms must be scheduled by investigators through an online reservation system. Go to https://meetatbigblue.uky.edu and use your linkblue ID and password to access the reservation system. Please contact the DLAR Animal Care Supervisor of the facility for assistance with scheduling procedure rooms.

**Additional considerations:**
When you are planning procedures, please also consider the length and timing of your tasks with consideration for animal husbandry activities as well as those of other researchers sharing the housing room. The DLAR technicians working in the rooms and the DLAR Supervisor of the area can both provide information on cage change schedules as well as the location of procedure rooms.

Many species can hear frequencies of sound outside the range of humans. Research equipment can generate this type of noise, especially those with video display terminals or processors. To the greatest extent possible, activities that might be noisy should be conducted in areas separate from those used for animal housing.
If you have unique procedural needs that cannot be performed by the guidelines above, please also feel free to contact one of the DLAR Veterinarians for further assistance.

Examples of rodent caging:

The Top Flow IVC cage can convert to a standard micro-isolator cage if necessary and is able to be placed on a shelf rack. The large filter enables the cage to allow sufficient air flow to prevent excessive CO2 buildup. These cages can be used in this manner for a number of days if required.

This IVC Mouse cage is an example of a “Safe Seal” cage and DOES NOT convert to a standard micro-isolator cage. It should NOT be used on a shelf rack or bench top for any length of time. There is a danger of toxic CO2 buildup due to the restricted air flow in a relatively short time (6-8 hours depending on the number of mice in the cage) when not used in a ventilated cage rack system.

This is a standard static micro-isolator cage. These cages may be used for regular long term housing on shelf racks.

The "Red Line" from Allentown and the “Green Line” from Tecniplast are two other types of IVC caging used in the DLAR Animal Facilities. Both types convert to static micro isolators if needed.

Rack configuration, cage types, water valves, Housing Density Policy, and other useful information, including the use of color-coded Special Alert Cards and Service Request forms can be found in the Reference Section of this Handbook.

Additional types of caging for both rat and mouse are used in the DLAR facilities. Please contact the animal care supervisor in the facility your animals are housed for additional information on the housing used with the animals on your study. Housing needs for species other than rodents should be discussed with our facility manager, animal care supervisors, or our DLAR veterinarians.

Returning dirty caging to Cage Wash

If you will be returning dirty caging from your lab or housing room to the dirty side of cagewash, please remember before you leave the lab or housing area to ALWAYS check INSIDE of the cage you are returning to be sure there are no animals present BEFORE you place the cage in the designated area for the facility you are working with. Animals that have been euthanized must go into the designated cooler or freezer in the facility you are working in. DO NOT leave them inside the dirty cage when it is returned to cage wash.

Inquiries and Problems
“We can't fix it if we don't know it’s broken!” If you have a problem, please let us know.

If you have a concern or a question with husbandry care or animal caging or other equipment, or you see a potential problem, please do not correct it yourself unless the animal's life is in danger.
Instead, contact one of the DLAR supervisors so that they can evaluate the problem firsthand. A DLAR supervisor is always on duty. Instructions for contacting them are located in the DLAR entryway and the DLAR website on the Intranet. [https://www.research.uky.edu/division-laboratory-animal-resources/about-dlar](https://www.research.uky.edu/division-laboratory-animal-resources/about-dlar)

Our ability to directly observe the problem greatly aids us in trouble-shooting the situation and making sure that the problem doesn't happen again.

**Unresolved problems.**

If you have repeated or unresolved problems with the daily care of your animals, please bring your problem to the attention of our Animal Care Supervisors. They can often resolve issues in short order, but they must be made aware that a problem exists. Please allow them to assist you by informing them of the nature of your difficulties. If the situation is still not addressed to your satisfaction, please contact our DLAR Facility Operations Manager. The contact information is listed in our staff section of this manual.

**Transportation of Animals**

Live animals may not be removed from the animal facility without prior approval of the Institutional Animal Care and Use Committee. **Under no circumstances can rodents or other laboratory animals be transported by personal vehicles.** If animals must be moved to other facilities for housing or transfer to another investigator, DLAR must transfer them. Transfers from one location to another must be done by filling out a DLAR Services Request Form found on our website on the “Forms” page at the following web address [https://www.research.uky.edu/division-laboratory-animal-resources/dlar-forms](https://www.research.uky.edu/division-laboratory-animal-resources/dlar-forms)

Animals that are being transported to investigator laboratories MUST be **COMPLETELY covered or in a closed transport cart and can ONLY be transported in the service/freight elevators.** They must not be transported into or through any patient areas like waiting rooms or clinics under any circumstances. If you will be moving through patient areas or to another building, animals must be transported in a closed cart. **If you are using an open cart be certain NO PART of the CAGE is visible. Avoid carrying a single cage by hand without placing it on or in a cart. There is the possibility that you may drop the cage and injure the animals or they may escape.** When returning dirty caging to the animal facilities, be certain the cage is empty and does not contain animals alive or deceased. Dirty cages must be covered as well to protect personnel from potential exposure to animal allergies.

**Examples of what you CAN use to completely cover cages:**

- Drapes
- Towels be sure it covers COMPLETELY
- Pillow Case most mouse cages will fit rat cages will not fit
- Closed cart
- Cabinet type cart
Examples of what **NOT** to use to cover cages

- **DO NOT USE “YELLOW GOWNS”**
- **DO NOT USE YOUR LAB COAT**
- **DO NOT USE WATER BOTTLE BASKET COVERS** These are custom made to fit clean/sterile water baskets and belong to DLAR

DLAR has stainless steel enclosed transport carts if investigators must travel between buildings or in high traffic areas. These carts may be reserved by contacting the Animal Care Supervisors. **Transportation of laboratory animals housed in the DLAR facility by private vehicle is strictly prohibited.** Please refer to the Office of the Attending Veterinarian, IACUC section on the web page address listed below.


**Procedure Rooms**

- DLAR has a limited number of procedures rooms that can be reserved for use by our researchers. Please go to [http://meetatbigblue.uky.edu/](http://meetatbigblue.uky.edu/) and log in with your linkblue ID and password to access the reservation page. All researchers on approved animal use protocols are able to access this system. If you need assistance, please contact your area supervisor.

**Service Requests**

- The Division of Laboratory Animal Resources is able to meet a number of investigator needs with regard to the animals housed in our facilities. The requests routinely carried out by DLAR are, transferring ownership, transportation of research animals, special observations and attention to chronic issues such as teeth clipping, the administration of medicated water, and a wide range of other simple procedures associated with routine animal care.

  ✴ Please see the reference section in the back of this handbook for samples of these forms and a brief explanation of the various forms used

  ✴ Please note that Service Requests should be submitted AT LEAST 24 hours prior to the effective start date and should be delivered to the supervisor of the area your animals are housed in. If the Special Request is to start over the weekend, it should be delivered to the area supervisor no later than the Thursday prior to the start of the weekend requested. Service Requests submitted on a Friday afternoon may not appear on the weekend duty schedule.

**Storage of Drugs or Biologics**

- Due to space considerations, the storage of drugs and biologics in the DLAR facilities is very limited. Investigators are encouraged to bring these items with them when they are needed. There is limited space available in some of the Procedure Room on an assigned cabinet space basis as these become available. DLAR must have a key to any locked cabinets that you have been assigned. This would include the combination to any combination lock placed on the cabinets. Please note that **ALL** drugs and biologics should be securely stored
and ALL packages, bottles, vials and other containers MUST BE CLEARLY LABELED with substance and expiration date and contact information. NO EXPIRED MATERIAL is allowed to be stored in DLAR and may not be used in live animals. Absolutely NO OTHER may be stored or used in DLAR.

Special Diets

All Special diets must be listed in your approved animal use protocol. If there is a need for Special Diets, it may be ordered and delivered with our regular feed delivery if ordered from the same vendor. DLAR will notify you when it arrives so that you may take it to your lab or arrange for it to be stored in the DLAR food storage area. You will need to coordinate this with our supervisors and Facility Manager. Their contact information appears on our webpage (https://www.research.uky.edu/division-laboratory-animal-resources/about-dlar) and in the reference section of this handbook. We have limited storage for small amounts of food that needs refrigeration in specially marked refrigerators. All food must be clearly marked with investigator name, manufacture date, storage conditions, expiration date for the food and the type of food contained in the package. The container must be secured with a lid or if in a plastic bag, it must be sturdy and closable ("Ziplock®" freezer bag type). Should the bag tear it must be replaced. Please try to avoid using glass whenever possible. Improperly labeled feed will be discarded if no contact information is available.

Animal Health Division

The health of all of the animals in our care is very important to us. We do extensive health monitoring using sentinel animals in each rodent room to ensure the health of our rodent colonies. In addition to our monthly in-house testing, we submit samples for independent surveillance of the health of the colonies at UK.

Veterinary and Veterinary Health Technician Services

Our DLAR Veterinary Staff is ready to assist you in the design of protocols for animal research, surgical consultations, treatment alternatives, locating animal-related services not available at UK, and participation in collaborative research. Please contact them to arrange for a consultation

We have a staff of full-time registered veterinary technicians whose primary focus is the well-being of our animals. Under the guidance of our DLAR veterinarians, our veterinary technicians routinely respond to all reports of animals in distress or reported to be ill or “not quite right”. The reports generated by our animal care technicians are attended to as soon as they are reported. Our veterinarians are available for consultations, to prescribe treatments, and to respond to emergencies.

How to contact our veterinary technicians:

Meggie J. Coleman, BS, LVT  Amelia Hall, RVT  Bonnie Newsome  Karianne Zamir
Clinical Veterinary Technician  Clinical Veterinary Technician  Clinical Veterinary Technician  Clinical Veterinary Technician
Phone: 257-4592  Phone: 323-1547
Pager: 330-3092  Pager: 330-0388
meggie.coleman@uky.edu  Amelia.Hall@uky.edu  Bonnie.Newsome@uky.edu  Karianne.Zamir@uky.edu

Experimental Surgery

Our Experimental Surgery Unit offers 3 fully equipped surgery suites and one diagnostic/surgical area. One suite is dedicated for multi-species sterile surgery, one suite may
be used for sterile or non-sterile surgical procedures, and the third suite is a dedicated species sterile surgery. We have a wide variety of instruments available for use, and do steam, gas and chemical sterilizations. The operating rooms are fully equipped and are maintained at the highest standards for sterile surgery. Our diagnostic area/surgery is dedicated as an imaging room and contains Cardiac Fluoroscopy, digital imaging and dental x-ray equipment. Should you wish to visit the surgery suites, please contact our surgical team coordinator or either of our surgical technicians. You will find their contact information on our Surgery Resources page of the DLAR website or on the Contacts page. [https://www.research.uky.edu/division-laboratory-animal-resources/experimental-surgery](https://www.research.uky.edu/division-laboratory-animal-resources/experimental-surgery) Access to the surgical facility is restricted. You must have an IACUC approved animal protocol with a surgical component. Additional approval forms are available from the DLAR office which must be approved by our veterinarians prior to access being granted.

**Of special note:**
If you will be doing survival surgery on any species of animal(s) (rodents, rabbits, etc.) please remember that all procedures **MUST** be on your IACUC approved protocol, appropriate analgesics are listed and provided to the animal pre and/or post-operatively and that all animals are closely monitored during and after surgery until they are totally ambulatory. No animal is to be left unattended while still in an anesthetized state. A chart of recommended anesthesia and analgesics is available on the DLAR webpage address [https://www.research.uky.edu/division-laboratory-animal-resources/animal-health-veterinary-information](https://www.research.uky.edu/division-laboratory-animal-resources/animal-health-veterinary-information) If you require further information or guidance, please contact one of our DLAR veterinarians.

**Scheduling the Surgical Area**

Surgical suites may book as much as 3 months in advance so the earlier you reserve your dates, the better. We prefer to do survival surgery toward the beginning of the week if possible. Please contact: our Experimental Surgery unit. If there are specific questions that you need an answer to immediately you may contact Hollie van Roooyen [hskuf2@email.uky.edu](mailto:hskuf2@email.uky.edu) Phone: 859-323-5829. If you are unable to reach our surgery technician, please try to contact one of the following individuals; Wade Washington [washing@email.uky.edu](mailto:washing@email.uky.edu) Phone: 859-323-0289 or Dr. Jeff Smiley 859-323-0289. The fee schedule for the Experimental Surgery use can be found in the Per Diems and Other Service Fees section [https://www.research.uky.edu/division-laboratory-animal-resources/diems](https://www.research.uky.edu/division-laboratory-animal-resources/diems). Technical assistance is available on a fee for services basis if needed. The complete text of the [IACUC Guidelines for Rodent Surgery](https://www.research.uky.edu/officer-attending-veterinarian/iacuc-policies-procedures-and-guidelines) may be found at the following: [https://www.research.uky.edu/officer-attending-veterinarian/iacuc-policies-procedures-and-guidelines](https://www.research.uky.edu/officer-attending-veterinarian/iacuc-policies-procedures-and-guidelines)

**Excerpt from IACUC Guidelines for Rodent Surgery pertaining to post-operative monitoring and care** is as follows:

**Post-surgical anesthetic recovery period**
Frequent and documented observation of animals during the post-surgical anesthetic recovery period is important. The animal, in or out of its cage, must be kept warm. Warm water pads, blankets, or the blue "diaper" pads work well. The use of electric heat pads or heat lamps may overheat the animal and their use is discouraged. If electric heat pads or heat lamps must be used, provision must be made to make frequent observations and turning of a somnolent animal so that the animal will not be
overheated. Provision must also be made so that an awake animal can escape the heat source when it becomes too warm. Warmed fluids can be administered subcutaneously, intravenously, or intra-peritoneally if there is any suspicion the animal may be dehydrated. A recovering animal should be watched very closely until securely in sterna recumbency, and able to move around without plugging its nostrils with bedding. Some rodents left overnight on pads or paper bedding will eat that bedding.

**Post-surgical period**

Daily postsurgical observations should, at a minimum include observations of the condition of the animal and the surgical site. Sutures and/or staples need to be removed by two weeks following surgery, if the rodent has not already done so. Any foreign substance, including sutures, catheters, implants, etc., left in the incision for long period of time can serve as a nidus of irritation and infection. A veterinarian should examine incisions that do not appear to be healing. Animals found dead during the post-surgical period should be submitted for diagnostic necropsy.

Rapid identification of infectious diseases, post-surgical infections, surgical problems, etc., permits responses by the veterinary or research staff to improve the surgical outcomes, minimize variability, and enhance the research results.

**Post-Operative Recovery and Care of Mice and Rats**

Following all procedures, animals will need to be directly and continuously observed and monitored in a warm environment until they are fully recovered from anesthesia. Unless prior arrangements for continuous monitoring have been made with DLAR Veterinary Services for monitoring, research staff are expected to monitor their animals. Animals are considered recovered from anesthesia when they can ambulate fully, maintain themselves upright in sternal recumbency and are attempting to move purposefully (see [https://www.research.uky.edu/office-attending-veterinarian/iacuc-policies-procedures-and-guidelines](https://www.research.uky.edu/office-attending-veterinarian/iacuc-policies-procedures-and-guidelines). At a minimum, rodents should be observed frequently postoperatively for recovery, once recovered at about 6 hours and again at 18-24 hours post-operatively for signs of pain, infection or dehiscence (opening up of the incision). Animals should be observed daily for the first 7 days after surgery. The surgery and the date should be noted on the cage card. There are special Surgery cards to be placed by the investigator behind the normal cage card. These special card include the contact information, analgesic/treatment record, and observation information as to Surgical site and Alert response. Dates, and times, and findings of each post-operative observation and the dates, dosages, and times of each analgesic administration should be maintained on the cage card in a form clearly legible for the Facility Veterinarian. Wound clips and non-absorbable skin sutures are to be removed at 7-14 days post-surgically.

Frequent and documented observation of animals during the post-surgical anesthetic recovery period is important. The animal, in or out of its cage, must be kept warm. Warm water pads, blankets, or the blue "diaper" pads work well. There are special rodent surgery tables also. The use of electric heat pads or heat lamps may overheat the animal; their use is discouraged. If electric heat pads or heat lamps must be used, provision must be made to make frequent observations and turning of anesthetized animal so that the animal will not be overheated. Provision must also be made so that an awake animal can escape the heat source when it becomes too warm. Warmed fluids can be administered if there is any suspicion the animal may be dehydrated. This may be done by giving 1 to 2 ml of warm sterile fluids (0.95% NaCl or equivalent) per 100 gm of body weight by subcutaneous injection. If blood loss occurred during the surgical procedure, or if the animal is slow to recover from anesthesia, provide additional fluids.
It is essential for a recovering animal to be watched very closely until **walking or securely in sternal recumbency, and able to move around without plugging its nostrils with bedding if present.** Therefore it is best to perform surgery as early in the day as possible. Animal recovery can vary greatly, so you should always plan on a minimum of two hours post surgery to allow enough time to monitor your animals.

A postoperative record on DLAR surgery cards must be started and affixed to the animal's cage. Having the record in the room accomplishes several functions. 1) It explains the condition of the animals to animal care staff (a sedated animal may otherwise be thought to be ill), 2) It assures animal care staff and USDA Animal Welfare inspectors that the animal is being cared for, and 3) It informs animal care staff how recently the investigator has seen the animal; this knowledge helps them decide whether or not there is a need to contact the investigator to inform him or her of the present condition of the animal. Although individual records are desirable, USDA allows a composite post-operative record to be used for a group of rodents.

**Anesthesia**

The Experimental Surgery Unit has a number of anesthesia machines available to investigators on a fee for services basis. The rodent anesthesia machines may be rented by contacting our Experimental Surgery unit. The rental fee includes setup and training if needed. Please contact them using the information provided in the above paragraph for further information and to make reservations for these machines. Training on the use of these machines is available from our research analysts’ or surgical technicians. All users of the anesthesia machines are encouraged to take advantage of the training in order to be sure that you are familiar with the equipment so you will be able to operate it safely for yourself and your animals during anesthesia.

**Other Services**

Technical/surgical/monitoring/post-surgical monitoring assistance is available on a fee for services basis if needed.

**Cryopreservation/Redirevation**

For these services, please contact Dr. Jeanie Kincer  jfkinc2@email.uky.edu

**Technical Services**

The Division of Laboratory Animal Resources has a team of Research Analysts available on a fee for services basis. A wide variety of services are available to you from individual animal micro chipping to surgical assistance, post operative monitoring, and administration of post-operative medications. Should you require extra assistance with your studies, or additional expertise, please contact Jason Oakes, Glenn Florence or one of our DLAR Veterinarians to discuss your needs. We will make every effort to help, but please note, in some cases due to scheduling conflicts, it may be difficult to assist on short notice.

Examples of Animal procedures include:

- Injections
- Blood or urine collection
- Tail biopsies
- Specialized techniques (implantation, surgical procedures)
Tissue collection from euthanized animals
Breeding colony management and maintenance
Special Observations and monitoring

Note: Requests for services must be submitted at least 48 hrs in advance.
Requests for euthanasia require a signature.
DLAR cannot guarantee that the same person will perform the service every time.
Anesthesia always involves a risk of animal death.

Breeding Colony Management
One of the most labor intensive tasks for any lab is the management of their breeding colonies. We offer this service to our investigators on a fee for services basis. Our research analyst in charge of breeding colony management has a wealth of experience and has attended the Jackson Laboratories Breeding Colony Management course in Bar Harbor, Maine. He is also an AALAS Certified Laboratory Animal Technologist. He is available for consultation and assistance along with our DLAR veterinarians, to address your breeding colony needs. Please contact Glenn Florence at 257-1026.

Sample Collection
Our team of research analysts can provide a variety of sample collections such as blood collection, tissue collection for genotyping, data collection and other services.

Other Services
Other services performed by our research analysts include routine weighing, observation of animals, post-surgical monitoring, assistance with surgical procedures, dosing, medications, and other data collection your lab may require. These services must be requested in advance to avoid scheduling conflicts. They are also available for training in the use of anesthesia machines and basic procedures.

Animal Pathology Division
Diagnostic veterinary services are available including tissue or organ collection and full pathology and histopathologic services by the Laboratory Pathology Unit at the University of Kentucky Veterinary Diagnostic Laboratory (UKVDL), and Dr. Carney Jackson, Pathology Consultant to DLAR.
Research pathology services are available through this fee for services unit. Please coordinate these services through our DLAR Veterinarians and for additional information on available services. Forms for submission can be found on the DLAR website at the following address: https://www.research.uky.edu/division-laboratory-animal-resources/pathology

Animal Procurement
All animal procurement must be coordinated through the Division of Laboratory Animal Resources (DLAR).
Animals cannot be procured until an approved protocol is available on line in eSirius®.
All animal procurement, regardless of source or cost, must be processed through DLAR.
All animal orders must be submitted electronically through eSirius®.
All animals being received into or shipped from the facility will be scheduled by DLAR personnel.
All animals being received into the facility will be required to have a certificate of health status.
Under no circumstances may animals of any kind, other than those ordered from approved vendors or animals that are currently housed in DLAR facilities, be brought into DLAR by research or non-DLAR personnel. This applies to research, pet, stray or injured animals.

**Importing or Exporting of animals**
Please refer to the Quarantine and Acclimation section. You may, also, contact Ronda Combs by email rkcomb1@email.uky.edu or 859-323-6018.

**Ordering animals**
All animal orders must be submitted electronically through eSirius.

**Mice:** Orders must be placed by Wednesday, 12:00 p.m. for the following Monday delivery from Harlan and Jackson Laboratory and Tuesday for delivery from Charles River and Taconic. If animals are ordered from NIA (National Institute on Aging) they must be in the DLAR office before 10:00 AM on Tuesday for placement.

**Rats:** the same as mice

Please contact Cheryl Carmichael in our main office if you have questions.

**Other species:** Contact the DLAR office for information.

**Quarantine and Acclimation**
All animals received from other institutions or vendors other than Charles River, Jackson Laboratory, Taconic Farms or Harlan Sprague Dawley are held in quarantine after receipt. During quarantine, animals are screened for selected pathogens.

The length of quarantine depends on the species origin and/or the intended use of the animals.

Quarantine is a minimum of 45 days for rodents. Rodent breeding stock and animals from non-standard vendors, and animals from outside the U.S. may require an extended quarantine.

Quarantine for non-human primates will be the length of time it takes for successful completion of the required TB testing, approximately 60 days. This process could require some length of time. Please consult with DLAR veterinarians on this matter.

Animals cannot be used experimentally nor used as breeding stock while in quarantine. Please plan accordingly.

If you wish to obtain animals from another institution or you will be sending animals to another institution, please contact our Animal Import Coordinator, Ronda Combs by email or telephone, rkcomb1@email.uky.edu or 859-323-6018. Her contact information appears on our Contact page on the DLAR website as well. Our Request to Import Rodents form appears in the Reference section of this handbook and can be found on the Forms page of the DLAR website.

https://www.research.uky.edu/division-laboratory-animal-resources/dlar-forms

**Cage Cards, Census, and Per Diems**
All cages must have a proper cage card issued by DLAR. The information on the cards indicates the following:
Principle Investigator
Protocol Number
Cage Description
Requisition Number
Who to Notify
Date Received
Strain/ Species
Account Number
Age and Date of Birth
Sex and Weight (if appropriate)
Identification Number
Vendor
And a Miscellaneous category

**Bar Code Number for activation and deactivation of per diems**

Of special note, cage cards MUST NOT be reused. Each card is unique. If you need extra cards for splitting cages or weaning animals, please contact Cheryl Carmichael. There is no charge for this service. The cage cards contain pertinent information as well as a bar code. This bar code is critical to accurate animal census and should be dated and returned to the main office when the cage card is removed and the animals are used. If the card is damaged, please request a new card from Cheryl Carmichael to ensure accurate accounting of the animals. Please do not place tape on the cage cards or cover the bar codes.

The cage cards are scanned every week and missing cards or damaged cards that do not scan are still charged per diem for up to two weeks unless the bar codes are deactivated. The DLAR staff checks the bar code drop envelopes twice daily during the week and bar code tops are returned to the office for deactivation. **The bar code slips are not routinely collected on the weekends.**

When turning in the portion of the cage card containing the bar codes please be certain that you write the date of removal on it for proper deactivation date. This simple practice will save you per diem charges for cages that are not there or bar codes that are deactivated when they appear in the envelopes during regular collection.

Our current Per Diem chart is located at the following web address on the DLAR webpage

https://www.research.uky.edu/division-laboratory-animal-resources/diems

**Training**

**Requirements for personnel who use animals in research at University of Kentucky**

The University of Kentucky Institutional Animal Care and Use Committee has outlined minimum requirements for training for investigators and has outlined those requirements in the following document: https://www.research.uky.edu/office-attending-veterinarian/iacuc-policies-procedures-and-guidelines

- Must complete required online training modules through the AALAS Learning Library
- Must participate in the Occupational Health and Safety Program
- Must complete requirements to be listed on an approved animal use protocol
- Must be listed on an IACUC approved animal care and use protocol
Must obtain access into the facilities through the DLAR office
Must participate in Continuing Education requirements

**In addition to the IACUC required training, all individuals accessing the DLAR facilities must attend the DLAR Orientation given twice monthly. All personnel working with animals must receive appropriate training in the use of animals.**

Assurance of training for research personnel is primarily the responsibility of the Principle Investigator or protocol director. Training is available through the Division of Laboratory Animal Resources Veterinary staff and our training coordinator on a wide variety of common procedures and species specific information.

DLAR has a variety of books, CD’s, DVD’s and publications in our library located in H41A of the Chandler Medical Center. Individual training sessions can be scheduled on a variety of basic and species specific procedures. We have several PowerPoint presentations available to your lab as requested.

DLAR also conducts workshops from time to time on basic procedures and anatomy of rats and mice. Contact the DLAR Training Coordinator for more information and other available resources.

**Occupational Health and Safety**

No consumption of food or beverages, chewing gum or mints, is allowed in the animal facilities or laboratories, except in designated areas. Opened/uncovered containers of food or beverages cannot be transported through the hallways or into the animal housing rooms, experimental surgery or laboratories.

Do not attempt to go over, under, or through hallways that have been blocked by yellow chains. These areas are blocked off when dirty/contaminated nonhuman primate caging is being moved through the hallways.

**Do Not Wear Open Toed Shoes, Sandals or “Flip Flops” or any other shoe that does not provide adequate foot protection in The Animal Facility as This Constitutes a Personal Safety Hazard.**

Do not wear or carry umbrellas, outer coats or jackets into the animal rooms. Personal items such as purses or backpacks cannot be taken into the animal room – please leave personal items in your lab. No food or drink including chewing gum or mints are permitted to be used or consumed in the animal rooms or hallways.

Wear dedicated lab coats, disposable gowns, or dedicated scrubs when entering animal areas. Remove and discard disposable lab coats and gowns in DLAR when leaving the facility. Do not wear shorts, skirts, tight-fitting leggings or nylon, pants or slacks that do not cover your ankles into the animal rooms as per University of Kentucky Environmental/Biological Health and Safety and DLAR policy. Follow the EHS guideline on laboratory safety as DLAR animal rooms fall within those guidelines. Do not wear your
dedicated lab coat into the public areas of the hospital as this may put some patients at risk. Clean or launder lab coats whenever they become soiled or at least weekly.

**ALWAYS** wear gloves and other personal protective clothing as indicated while handling animals.

Wash your hands before leaving the area or use the hand sanitizers located throughout the facility.

**Allergies**

Allergies are the most common human health problem associated with laboratory rodents. People that already have allergies may be more likely to develop rodent allergies. The allergens are proteins in the urine and dander. Prudent practices involve wearing protective clothing (gown or lab coat, gloves, and mask) and working with animals in hoods whenever possible. Remember to always wear appropriate personal protective equipment when working with laboratory animals.

**Bites and Scratches**

A common human health problem associated with laboratory animals Avoid injury by learning how to properly handle and restrain animals; if you are unsure about correct procedures or need assistance, ask at the DLAR office, or contact the DLAR Training Coordinator to arrange for training in the procedures. If you are bitten or scratched, regardless of the perceived severity of the injury:

- Clean the injured area appropriately, remembering that any bite or scratch wound can easily become infected.
- Report the accident to an Animal Care Supervisor as well as your own Supervisor, lab manager or Principal Investigator.
- Contact UK Workers Care for further instructions 1-800-440-6285.
- Remember that ALL accidents regardless of the severity should be reported to UK Environmental Health and Safety. If the injury involves an animal bite or other injury, you must fill out the Accident Report involving animal injury and forward it to the UK Biosafety officer. [https://ehs.uky.edu/ohs/accident.php](https://ehs.uky.edu/ohs/accident.php)

**Sharps Containers**

Always dispose of all sharps such as needles, empty syringes, scalpel blades, etc. in sharps containers and remember **DO NOT RECAP NEEDLES**, they must be placed in the appropriate sharps container located in the procedure rooms. Do NOT throw trash such as paper towels, gauze pads, alcohol preps, etc. into the sharps containers. Remember to keep sharps containers as close to your work area as possible to avoid having to walk across the room to dispose of sharps. If you cannot locate a sharps container, please let one of our technicians or supervisors know. Boxes for broken glass are available in each facility, contact the area supervisor.

**REGULATORY AGENCIES AND OTHER OVERSIGHT**

The United States Department of Agriculture conducts visits to every institution that uses a USDA covered species in any way in any IACUC approved protocol. United States Department of Agriculture regulations refer to the Animal Welfare Act governing the transportation, handling, housing and sale of certain species of animals. [https://www.research.uky.edu/division-laboratory-animal-resources/regulatory-agencies](https://www.research.uky.edu/division-laboratory-animal-resources/regulatory-agencies)
**USDA/Animal Welfare Regulations (Title 9 CFR parts 1 and 2)** The Animal Welfare Regulations cover the use of animals in teaching, testing, and research. It is administered by the United States Department of Agriculture (USDA). The provisions of the law set standards for the purchase, housing, and use of laboratory animals and requires prior approval of all animal use by the IACUC. It, also, requires training of all personnel. The University of Kentucky must submit an annual report to the USDA, listing numbers of animals used, species, and how many received pain-relieving drugs. The USDA conducts unannounced inspections annually to insure compliance. During these inspections, records of covered species are checked, selected protocols are reviewed, and The Institutional Animal Care and Use reports as well as other pertinent data are reviewed by the inspectors. Species covered under the Animal Welfare Act include:

- Rabbits
- Cats
- Dogs
- Ferrets
- Hamsters
- Gerbils
- Guinea Pigs
- Wild-caught rodents
- Non-human primates
- Laboratory sheep and goats (farm animals not used for food or fiber)
- Laboratory Swine (farm animals not used for food or fiber)

**The Public Health Services Policy** covers all animals used in any way on all IACUC approved protocols regardless of species View the Public Health Services Policy. Institutions must meet federal guidelines before applying for federal funds to conduct animal research. These guidelines apply to all vertebrate animals, and to all animal research, regardless of the source of funding. The University of Kentucky must submit an annual assurance to the PHS stating that it adheres to these guidelines.

**OLAW - Office of Laboratory Animal Welfare** is an office of the National Institutes of Health responsible for implementation of the Public Health Service Policy. You may view the OLAW website at the following web address: [http://grants.nih.gov/grants/olaw/olaw.htm](http://grants.nih.gov/grants/olaw/olaw.htm). This site contains multiple links to various resources available to the investigator outlining many of the policies and procedures which must be followed in order to research on vertebrate animals.

- National Academy of Science (NAS)/Institute for Laboratory Animal Research (ILAR)
- Veterans Administration (VA)/ Department of Defense (DOD)
- National Institutes of Health (NIH)


**The Centers For Disease Control** (CDC) is a government organization that is dedicated to protecting health and promoting quality of life through the prevention and control of disease, injury, and disability. It provides information on many aspects that can pertain to laboratory animal research. One of its publications in collaboration with the National Institutes of Health and others is **The Biosafety in Microbiological and Biomedical Laboratories (BMBL)** 5th
Edition. This publication contains guidelines for the proper containment of biologic agents used in research and can be viewed at the following web address:

The Association for Assessment and Accreditation of Laboratory Animal Care, International is a voluntary peer review organization that conducts in depth reviews of all aspects of an institutions’ animal care and use program including veterinary care, husbandry practices, animal housing facilities, training, and institutional policies. The University of Kentucky Division of Laboratory Animal Resources has had continuous accreditation since 1966. You can view the AAALAC site at the following web address: http://www.aaalac.org/.

The AVMA Guidelines on Euthanasia 2013, while not strictly a regulatory agency, it is important to know that humane euthanasia of all animal species fall under the guidelines and regulations of all of the regulatory agencies governing the humane care and use of laboratory animals in all protocols approved by the Institutional Animal Care and Use Committee. This document can be viewed at the following web address under Regulatory References and Resources,

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE

Mandated by both the Animal Welfare Act and NIH policy
Must review and approve all proposals for animal use before animals are purchased
Must re-review protocols annually
Must conduct facility inspections and to review the animal use program twice yearly.

Contact Information for the IACUC: https://www.research.uky.edu/office-attending-veterinarian/about-oav

Animal Protocols

All use of animals requires prior approval by the Institutional Animal Care and Use Committee.
Research must not be unnecessarily duplicative.
Alternatives must be considered before animals are used.
All procedures that cause more than momentary pain require the use of anesthetics or analgesics, or scientific justification for withholding of analgesics or anesthetics.

Necessary Elements of a Literature Search
The literature search is one of the most important parts of any Institutional Animal Care and Use Protocol and is a requirement of the Institutional Animal Care and Use Committee. It is important to note that a current literature search is more useful than a “from the beginning of recorded history” search. The essentials features of a good literature search are;
Date of search
Databases searched, or other sources consulted
Years covered in the search
Key words or search strategy used
For compliance with USDA and OLAW requirements, the search must clearly document a good-faith effort to find alternatives to painful or distressful
procedures.

Personal experience can be used, but it cannot be your only source.

References spanning the past 15 to 30 years is generally sufficient for most research projects. A comprehensive literature search needs to be done at the beginning of the protocol. Subsequent renewals of the same protocol, in the majority of cases, need only an updated search to include results of studies that have been done from the time of the previous full search. Included here are several sites to enable you to perform a search of available of pertinent information related to the area of your study.

- Web SPIRS
- CAB
- Biosis
- MedLine
- Agricola database
- PubMed
- Web of Science

Assistance can be obtained by contacting the following individuals in the University of Kentucky Libraries.

- Valerie Perry vperry@uky.edu 257-2758 at Agricultural Information Center
- Mark Ingram mark.ingram@uky.edu 323-6568 at Medical Center Library
- Gracie Hale ghale@email.uky.edu 218-1147 at Medical Center Library

Assistance with and training in literature searches can be obtained by contacting the University of Kentucky Libraries at the following addresses:

MCL homepage: www.uky.edu/libraries/MCL
MCL classes page: http://www.uky.edu/Libraries/libpage.php?lweb_id=33&llib_id=12

In addition, you may contact any of the DLAR veterinarians or the Office of Research Integrity at https://www.research.uky.edu/office-attending-veterinarian/about-oav to assist with protocol design.

Information, including literature searches, can also be obtained by contacting information specialists at:

Animal Welfare Information Center National Library of Medicine
National Agricultural Library National Institutes of Health
10301 Baltimore Boulevard Bethesda, MD 20894
Beltsville, MD 20705-2351 (301) 496-3147
Phone 301-504-6212 Fax: (301) 480-3537
FAX: 301-504-7125
E-mail: awic@nal.usda.gov
Homepage http://www.nal.usda.gov/awic

Alternatives to the Use of Animals
Replacement - use non-animal models whenever possible
Reduction - use the fewest number of animals consistent with good science
Refinement - use the most humane methods available
For assistance in this subject, please visit the following website for information on alternatives to the use of animals:
You will find resources and information on refinement, alternatives as well as other useful information.

USDA Pain Categories

According to regulatory agencies, all vertebrate animals used in research, teaching or testing must be assigned to an appropriate pain category. The chart below outlines these categories and a few of the examples for each. If you are in doubt as to which category your animals may fall under, please contact the DLAR veterinarians.

<table>
<thead>
<tr>
<th>USDA Category B</th>
<th>USDA Category C</th>
<th>USDA Category D</th>
<th>USDA Category E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breeding or Holding Colony Protocols</td>
<td>No more than momentary or slight pain or distress and no use of pain-relieving drugs, or no pain or distress. For example: euthanatized for tissues; just observed under normal conditions; positive reward projects; routine procedures; injections; and blood sampling.</td>
<td>Pain or distress appropriately relieved with anesthetics, analgesics and/or tranquilizer drugs or other methods for relieving pain or distress.</td>
<td>Pain or distress or potential pain or distress that is not relieved with anesthetics, analgesics and/or tranquilizer drugs or other methods for relieving pain or distress.</td>
</tr>
</tbody>
</table>

(Note: there is no USDA Pain Category A.)

A simple definition of a painful or distressful procedure on an animal in this:

“A procedure that would cause pain or distress in a human.”
It is important to remember and understand that if an animal will need to undergo multiple procedures, it must be placed in the category indicated for the most painful/distressful procedure it will be experiencing. Also note that a single animal cannot be placed in multiple categories.

Pain categories are described as follows:
**Category B** animals are those that are being “bred”, conditioned, or held for use in teaching, testing, experiments, research, or surgery but not yet used for such purposes. These animals have not been used for any research procedure, however minor. Category B is the place to put breeders and other animals that are not undergoing any experimental procedures.

**Category C** animals are not subjected to procedures that involve pain or distress or would require the use of pain-relieving drugs. Routine procedures such as injections and blood sampling from veins that produce only mild, transient pain or discomfort are reported in this category. Another example of Category C procedures is an observational study of animal behavior. Animals that are euthanized before tissue collection or other manipulations are also commonly placed in this category, if no other procedures performed that put them in a higher pain/distress category.

**Category D** animals are those subjected to potentially painful procedures for which anesthetics, analgesics, or tranquilizers will be used. The important concept is that animals are given appropriate anesthesia and/or pain relief to limit their pain and distress as much as possible.

Examples of category D procedures are
- Surgery conducted with appropriate anesthesia and postoperative analgesia;
- Rodent retro-orbital eye bleeding performed under anesthesia;
- Non-human primate tattooing performed for identification under anesthesia;
- Removal of small tumors under local or general anesthesia, and use of analgesia after an animal’s skin is exposed to ultraviolet light to cause a “sunburn”; and
- Terminal exsanguinations (euthanasia by removal of blood) under anesthesia.

**Category E** animals are those that are subjected to painful or stressful procedures without the use of anesthetics, analgesics, or tranquilizers. Withholding of anesthetics, analgesics, or tranquilizers can only be allowed if it is scientifically justified in writing and approved by the IACUC. Examples of category E procedures are lethal dose studies (e.g. LD50 studies) that allow animals to die without intervention, pain studies that would not be possible if pain-relieving agents were administered, and psychological conditioning experiments that involve painful stimuli such as noxious electrical shock that cannot immediately be avoided by an animal.

By law, the institution must annually report all category E procedures to the USDA and include a scientific justification supporting the IACUC’s decision to approve them. It is important for the information on category E procedures to be complete and accurate.

1. Descriptive text from AALAS Learning Library training module

**Reporting Concerns:**

All animals owned or used by the University of Kentucky for research or training will receive proper care, and will be used humanely in accordance with approved protocols, federal laws, and University of Kentucky regulations and guidelines. Any person who witnesses or suspects abuse of said animals is encouraged to report their concern to any IACUC member or to:

Dr. M. Paul Murphy, Chairperson  
UK Institutional Animal Care and Use Committee  
(859) 257-2728

Dr. Mark Suchow, University of Kentucky Attending Veterinarian  
(859) 257-1117
Dr. Lisa Cassis, University of Kentucky Vice President of Research  
(859)257-5294  
Or contact the Office of Research Integrity anonymously at  
1- (866) 400-9428 (toll free call)  
Written concerns may be sent to the  
UK Institutional Animal Care and Use Committee  
435 Bowman Hall, 151 Washington Avenue  
Lexington, Kentucky 40506-0059  

No adverse action will be taken against anyone making a report.  
You are NOT required to give your name.

Veterinary Consultation:

Veterinary consultations are available from the DLAR veterinary staff to assist you. Additional, the DLAR veterinarians may also serve as collaborators or co-investigators on your protocols when requested. Please refer to the DLAR website for contact information.  
https://www.research.uky.edu/division-laboratory-animal-resources

eSirius®:

eSirius® is UK's on-line IACUC protocol management and animal ordering system. Principle Investigators can request an eSirius user account by submitting a completed form https://uky.az1.qualtrics.com/ife/form/SV_3Fa9I70IdMX9WJf to the Office of Research Integrity (ORI). Questions regarding user accounts can be directed to Sheri Patrick in the Office of Research Integrity @ 859-257-3694. The Office of the Attending Veterinarian staff is responsible for administrative protocol development assistance, processing and routing for review of new protocols, amendments, 3rd year re-submissions and annual reviews. Please refer to the Office of Attending Veterinarian website for additional information  
https://www.research.uky.edu/office-attending-veterinarian/esirius3g and a list of specific responsibilities, SOP's, Guidelines, training contacts and eSirius® user manuals. You may alternatively access the DLAR website at the following web address:  
http://www.research.uky.edu/dlar/esirius.htm

RESOURCES:
The weight and food and water consumption is dictated by age and sex. Further information can be obtained by contacting the DLAR veterinary staff or the Training Coordinator. Strain specific information is also available on various vendor websites.  
Taconic Farms  www.taconic.com  
Harlan/Envigo  www.envigo.com  
Charles River  www.criver.com  

Information on mice can be found at the Jackson Laboratory website:  www.jax.org

AALAS Learning Library On-Line Learning  http://www.aalaslearninglibrary.org/ User names and passwords can be obtained by contacting Angie Croucher in the Office of Research Integrity  arictc2@email.uky.edu

Division of Laboratory Animal Resources Training Coordinator JoeAnn Croxford  ejcrox2@email.uky.edu
Cage Densities for Mice being housed in DLAR Facilities

In order to comply with space requirements of *The Guide for the Care and Use of Laboratory Animals* and other regulatory agencies, we have outlined the number of mice that can be housed in our various caging systems. Please refer to IACUC Guidelines and Standard Operating Procedures 110 Mouse Housing Density. This document can be found by going directly to the IACUC page [https://www.research.uky.edu/office-attending-veterinarian/iacuc-policies-procedures-and-guidelines](https://www.research.uky.edu/office-attending-veterinarian/iacuc-policies-procedures-and-guidelines) and clicking the appropriate link.

Below are examples of the different types of mouse housing caging used in the DLAR facilities, including the number of adult animals that can be housed in each type of caging.

<table>
<thead>
<tr>
<th>Cage Type</th>
<th>Required Floor Area [sq.in. (sq.cm.)]</th>
<th>5 (12.7)</th>
<th>6.0 (38.7)</th>
<th>8.0 (51.6)</th>
<th>12.0 (77.4)</th>
<th>15.0 (96.7)</th>
<th>19.0 (122.6)</th>
<th>23.0 (148.4)</th>
<th>31.0 (330)</th>
<th>66.0 (426.7)</th>
<th>81.0 (523.4)</th>
<th>107.0 (756.7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Mouse Cage &amp; Static Microisolator</td>
<td>7.5 (18.9)</td>
<td>11.75 (30.7)</td>
<td>5 (12.6)</td>
<td>67 (451)</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>yes</td>
</tr>
<tr>
<td>Techniplast 1145T Top-Flow Blue Line</td>
<td>6.5 (15.5)</td>
<td>15.87 (40.3)</td>
<td>7.05 (17.3)</td>
<td>67.43 (435)</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>\</td>
<td>yes</td>
</tr>
<tr>
<td>Techniplast 1284/8SL Top-Flow Blue Line</td>
<td>8.46 (21.5)</td>
<td>15.67 (39.8)</td>
<td>7.36 (18.7)</td>
<td>82.15 (530)</td>
<td>13</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>yes</td>
</tr>
<tr>
<td>Techniplast 1294/8SL Seal-Safe Blue Line</td>
<td>8.46 (21.5)</td>
<td>15.67 (39.8)</td>
<td>7.36 (18.7)</td>
<td>82.15 (530)</td>
<td>13</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>yes</td>
</tr>
<tr>
<td>Techniplast CM500 AERO Green Line</td>
<td>7.83 (19.9)</td>
<td>15.4 (39.1)</td>
<td>6.3 (6.79)</td>
<td>77.66 (501)</td>
<td>13</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>yes</td>
</tr>
<tr>
<td>Allentown XJ IVc cage (angled bottom)</td>
<td>7.64 (19.4)</td>
<td>15 (38.1)</td>
<td>5.16 (13)</td>
<td>77.5 (500)</td>
<td>12</td>
<td>9</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>yes</td>
</tr>
<tr>
<td>Large (King Box) Static Microisolator</td>
<td>10.5 (26.67)</td>
<td>19 (48.26)</td>
<td>6 (15.24)</td>
<td>153 (980)</td>
<td>25</td>
<td>19</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>3</td>
<td>yes</td>
</tr>
</tbody>
</table>

* Ages are based on the C57BL/6NStd inbred mouse and are only approximate and vary greatly between strains. The body weight is the limiting factor and the approximate age information is provided only for guidance.

The Chart below is from the new 8th edition of the ILAR publication *The Guide for the Care and Use of Laboratory Animals* (2010)
<table>
<thead>
<tr>
<th>Animals</th>
<th>Weight in grams</th>
<th>Floor Area/Animal, a in.² (cm²)</th>
<th>Height, b in. (cm)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mice In Groups ³</td>
<td>&lt;10</td>
<td>6 in² (38.7)</td>
<td>5 (12.7)</td>
<td>Larger animals may require more space to meet performance standards</td>
</tr>
<tr>
<td>Up to 15</td>
<td></td>
<td>8 in² (51.6)</td>
<td>5 (12.7)</td>
<td></td>
</tr>
<tr>
<td>Up to 25</td>
<td></td>
<td>12 in² (77.4)</td>
<td>5 (12.7)</td>
<td></td>
</tr>
<tr>
<td>&gt;25</td>
<td>&gt; (&gt;96.7)</td>
<td>5 (12.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female + litter</td>
<td></td>
<td>51 in² (33)</td>
<td>5 (12.7)</td>
<td>(Recommended space for the housing group)</td>
</tr>
</tbody>
</table>
Rat Caging

The housing density for rats is outlined in *The Guide for the Care of Laboratory Animals* and states that housing density is determined by several factors, the size of the cage and the weight of the animal. Each IVC Rat cage is different in floor space and the typical rat static micro-isolator can hold two adult rats weighing up to 500 grams each. Breeding animals or breeding pairs may have different space requirements to allow for optimum growth of young. If you will be working with rats, please consult the area supervisors as to the number of rats that can be housed in each cage type so as to remain in compliance with the IACUC and other regulatory agencies.

<table>
<thead>
<tr>
<th>Rat Caging</th>
<th>Maximum Rat Density</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (cm)</td>
</tr>
<tr>
<td></td>
<td>7.0 (17.6)</td>
</tr>
<tr>
<td>Standard Static Cage/Microisolator</td>
<td>10.5 (25.9)</td>
</tr>
<tr>
<td>Tecniplast GR900 Seal-Safe Plus</td>
<td>13.63 (346.0)</td>
</tr>
<tr>
<td>Tecniplast Double Decker</td>
<td>18.2 (452.0)</td>
</tr>
</tbody>
</table>

* Ages are based on the HoltK Sprague-Dawley rat and are only approximate.
The body weight is the limiting factor and the approximate age information is provided only for guidance.
<table>
<thead>
<tr>
<th>Weight</th>
<th>Floor Area/Animal</th>
<th>Height</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rats in Groups</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td>17 109.6</td>
<td>7 17.8</td>
<td>Larger animals may require</td>
</tr>
<tr>
<td>Up to 200</td>
<td>23 148.35</td>
<td>7 17.8</td>
<td>more space to meet performance</td>
</tr>
<tr>
<td>Up to 300</td>
<td>29 187.05</td>
<td>7 17.8</td>
<td>standards. This is particularly</td>
</tr>
<tr>
<td>Up to 400</td>
<td>40 258.0</td>
<td>7 17.8</td>
<td>true with breeding pairs, trios, or</td>
</tr>
<tr>
<td>Up to 500</td>
<td>60 387.0</td>
<td>7 17.8</td>
<td>females with litters</td>
</tr>
<tr>
<td>&gt;500</td>
<td>&gt;70 &gt;451.5</td>
<td>7 17.8</td>
<td></td>
</tr>
</tbody>
</table>

**Other Species**

DLAR has the ability to house a variety of common laboratory animals including rabbits, dogs, hamsters, guinea pigs, as well as mice and rats, birds and, on a limited basis non-human primates, sheep and pigs. When planning your studies, please consult with our veterinarians for further information.

Additional resources available from the Division of Laboratory Animal Resources include but not limited to:

- Micro Isolator presentation
- Recommendations for analgesia and anesthesia
- Breeding Colony Management presentation and Workshop, Pup aging chart, Weaning calendar
- Outline for managing breeding colonies
- List of Special cards and their usage
- links to the various forms and examples
- CD’s on Biomethodology in Mice and Rats, Rodent Survival Surgery
- Aseptic Surgery presentation and Workshop
- Handling and Injection Techniques
- Post-Surgical Monitoring and Basic Suturing workshops