

The University of Pennsylvania Mouse Phenotyping, Physiology and Metabolic Core

Standard Operating Procedure 1.01

General Policies and Procedures for Animal Users at the Mouse Phenotyping, Physiology and Metabolic Core

I. Purpose: The Penn Diabetes and Endocrinology Research Center (DERC) is committed to making a safe and pleasant place to work at the Mouse Phenotyping, Physiology and Metabolic Core (MPPM). In order to fulfill this goal, it is necessary for animal users to understand what is expected of them when working at the Mouse Phenotyping, Physiology and Metabolic Core. It is also necessary to receive full cooperation of each staff member in adhering to the policies and procedures outlined.

II. Responsibilities and Scope: All animal users working at the MPPM, Penn DERC, School of Medicine on the University of Pennsylvania Philadelphia campus are responsible for knowing and adhering to the policies and procedures outlined in this SOP. The Principal Investigators (PI) are responsible for making sure their staff understand and adhere to the policies; the sub-core directors, facility managers and/or designees are responsible for implementing these policies; and the MPPM PI is ultimately responsible for administering these policies.

III. Definitions:

A. Mouse Phenotyping, Physiology and Metabolic Core (MPPM): This facility provides measurement of several metabolic parameters including: energy expenditure, locomotor behavior, food intake, body composition, glucose and insulin tolerance, and insulin sensitivity in mice and rats. The assets of the MPPM include state-of-the-art instrumentation and a nationally recognized staff. MPPM currently provides three major services. 1) **Acute and Chronic Metabolic Monitoring**: utilizing Comprehensive Laboratory Animal Monitoring System (CLAMS) and Oxymax systems, 2) **Body composition measurement**: using dual energy x-ray absorptiometry (DEXA) and magnetic resonance imaging (MRI) 3) **Glucose Homeostasis Assessment**, thus giving researchers access to a broad range of metabolic tests.

IV. Procedures:

A. General Practices-All animal users shall conduct their research in accordance with the United States Department of Agriculture (USDA) Animal Welfare Act and the National Institutes of Health (NIH) Guide for the Care and Use of Laboratory Animals and University policies. To reduce conflicts with researchers at the

MPPM, the principal responsibility will belong to the PI and not their associates, post-docs, and technicians.

1. Work Areas: All researchers at the MPPM are responsible for their work areas including but not limited to the following:
 - a. Humane care and treatment of all laboratory animals.
 - b. Reporting of all mortality and morbidity of study animals to their PI and MPPM staff.
 - c. Reporting of any and all abnormal conditions and illnesses of research animals to their PI and ULAR staff.
 - d. Cleaning-up after themselves as a common courtesy for the next person coming in to do an imaging procedure.
2. Humane Treatment of Animals: All researchers are responsible for reporting any inhumane treatment or conditions of animals.
 - a. Incidents shall be reported to PI and the appropriate officials (facility supervisor, attending veterinarian, or a member of IACUC).
 - b. Documented incidents of mistreatment of any animal by an animal user may result in losing PI's privilege to use the MPPM for their animal studies, and disciplinary action according to University policies.

B. General Work Practices:

1. Mouse Phenotyping, Physiology and Metabolic Core (MPPM):
 - a. All animal research personnel are expected to conduct themselves in a professional manner at all times.
 - b. Children are not permitted in the MPPM. Visitors who must see researchers at the MPPM, must report to the appropriate Administrative office to obtain approval.
 - c. Eating, drinking, and storing food and beverages, for human consumption is not permitted at the MPPM.
 - d. Smoking is not permitted at the MPPM.
2. Hygiene:
 - a. All research personnel must wear gloves to prevent the transmission of infectious agents, etc. (refer to SOP # 2.01).
 - b. Wash hands after working with the animals.

C. Reporting of accidents:

MPPM provides metabolic services for mice and rats. All injuries, bites, scratches must be reported to the proper officials as per standard university and IACUC policy.

Standard Operating Procedure 2.01

Personal Protective Equipment Policy

I. Purpose: The purpose of this policy is to inform all staff and users of the MPPM that have contact with animals, of proper attire to be worn in the animal procedure room, in an effort to minimize their exposure to Laboratory animal allergies (LAA), and to protect them from zoonotic diseases and biochemical hazards which they may encounter in their daily work. The procedures outlined will also protect the general public from exposure to potential zoonotic and biochemical hazards that could be carried on your clothing if worn outside the animal procedure and magnet area. Finally, these procedures will protect the colony animals from exposure to potential infectious or hazardous agents brought into the animal facility on day-to-day clothing.

II. Responsibilities and Scope: This policy applies to all MPPM users. It is the Principal Investigator's responsibility to make sure that all animal users on their protocols have read and are aware of the proper protective clothing policy, and it is the responsibility of all animal users to adhere to the policy.

III. Definitions:

- A. Facility Area**-any place within an assigned animal facility where animal work is being performed or when traveling between animal facilities.
- B. Animal rooms**-animal rooms in CRB 703, 716D and 717.
- C. Public Eating Area**-this includes any street parked lunch truck, cafeteria or snack bar used by the public.
- D. Zoonoses**-diseases that are transmissible to humans from animals.

IV. Procedures:

- A. Yellow isolation gowns, disposable gloves, masks, caps, and shoe covers will be provided for all animal users in the CRB animal rooms.
 - 1. These items are to be used in the facility area, when handling animals, and must be removed before leaving the area.
 - 2. Disposable PPE must not be worn in public areas, such as the hospital or cafeterias.

- B. Wearing these items may reduce the incidence of developing allergies to animal dander, etc. If you suspect that you may be allergic or becoming sensitive to a particular species, please inform your supervisor and consult with Occupational Health Service (OHS). Additional respiratory protective gear will be provided upon recommendations of the OHS.

V. Directions:

VI. Safety Considerations:

Laboratory Animal Allergies-this is the most common health problem among people working with laboratory animals. According to the American Association for Laboratory Animal Science (AALAS), at least 30 percent of people working with laboratory animals develop allergic symptoms.

VII. References:

Acha, P and B Szyfres. 1989. Zoonoses and Communicable Diseases Common to Man and Animals. Pan American Health Organization, Washington DC.

Chomel, BB. 1992. Zoonoses of house pets other than dogs, cats and birds. Pediatric Infectious Disease Journal 11:479-87.

Committee on Occupational Health and Safety in Research Animals Facilities, Institute of Laboratory Animal Resources, Commission of Life Sciences, National Research Council. 1997. Occupational Health and Safety in the Care and Use of Research Animals. National Academic Press. Washington, DC.

Percy, DH and SW Barthold. 1993. Pathology of Rabbits and Rodents. Iowa State University Press. Ames, Iowa.

EHR & ULAR at the University of Pennsylvania. Allergens of Rodents. <http://www.upenn.edu/regulatoryaffairs/animal/zoonoses-rodents04.doc>

Standard Operating Procedure 2.02
Sharps Handling and Disposal Policy

- I. **Purpose:** This policy has been established to clarify the procedures for handling and disposing of potentially dangerous and biohazardous items. Sharps can cause physical injury and serve as a fomite for infection. Improper disposal of these biohazardous items can pose a potential health threat to employees.

II. Responsibilities and Scope: All persons using biohazardous items are responsible for the content of this policy and are obliged to be compliant with it while working in any University of Pennsylvania animal facility.

III. Definitions:

1. **Sharps:** Hypodermic needles, syringes, pipettes, broken glass, and scalpel blades. Any item with a sharp or cutting edge qualifies as a sharp.
2. **Sharps Disposal Containers:** Containers made of puncture proof plastic or metal and are colored red to indicate biohazard material and is marked with the universal biohazardous symbol. The container must be sealable for handling and autoclavable. Some sharps containers contain a sterilization indicator strip (color change indicate that the container has been autoclaved) on their bottom, others do not.

IV. Procedures:

- A. Sharps disposal containers must be provided in all areas where sharps are used.
- B. Sharps must be placed directly into the sharps disposal container to limit the potential for injury. **Never** place sharps in regular trash!
- C. Bending, recapping, clipping or removal of needles from syringes is prohibited.

V. Directions:

- A. On a daily basis, the sharps containers should be checked and replaced as needed. When a sharps container is 2/3 to ¾ full, its lid must be closed and sealed with autoclave tape in a crossover pattern before being removed from the procedure room for disposal.
- B. Any researcher observing problems with the sharps disposal containers or personnel compliance to procedures should report the problem to their supervisor. The supervisor will follow-up on the problem with the Office of Environmental Health and Radiation Safety (OEHS) at 215.898.4453.

VI. Safety Considerations:

All MPPM staff are encouraged to attend the OEHS Bloodborne Pathogen Training on an annual basis.

VII. References:

University of Pennsylvania's Biological Safety Manual or online training website, <http://www.ehrs.upenn.edu/index.html>

Purpose: Animal facilities generate several forms of waste and some require special handling. This standard operating procedure describes the safe and legal disposal of all waste materials in all animal areas. These policies will meet the standard set by the USDA, NIH and AAALAC as well as any regulatory rules placed on infectious wastes.

II. Responsibilities and Scope: These policies cover all animal areas at the University of Pennsylvania using animals for research, teaching or testing.

III. Definitions:

1. **Sharps**-Scalpels, broken glassware, needles, syringes & blades.
2. **Soiled animal bedding and feces**-non-contaminated soiled bedding
3. **General room trash** (other than bedding and feces)-this includes floor sweepings and the contents of room trash cans.
4. **Carcasses**-all carcasses are considered infectious waste and a biohazard.
5. **Contaminated bedding, trash and carcasses**-all of these are considered a biohazard.

IV. Procedures:

A. Non-contaminated Waste

1. Empty rodent boxes containing soiled, non-contaminated bedding is to be dumped in the designated areas within the animal facilities, not in the procedure room.
2. Messes made around the dumping station site are the responsibility of the person dumping the bedding.
3. All empty rodent cages are to be removed from the procedure room by the person(s) who used the cages for transport, and returned to the animal facility by the end of the day.

B. General Room Trash

1. All trash generated while using the procedure room should be placed in the trash can(s) provided in the procedure room.
2. Trash cans should be emptied at least twice a week but never allowed to overflow.
3. Place trash outside of the main corridor door for housekeeping to remove.

C. Carcass Removal & Disposal

1. Once received by the MPPM, mice are not allowed to return to the host animal facility. Animals will be euthanized by the submitting investigator's as per their approved animal protocol.

2. Submitting investigator's are responsible for placing the uncontaminated carcasses in leak proof bag body bag and returning the carcasses to the animal facility's cold room for disposal.
 3. Husbandry staff will load the refrigerated/frozen carcasses in the drums and seal them.
 4. The animal facility supervisor is responsible for sending the manifests received from the waste handler to the Office of Environmental Health and Radiation Safety. The office of EHRS has a legal requirement to keep on file ALL manifests of waste removal from the University.
 5. All freezers and coolers are to be kept clean of any blood or other leakage from carcass bags.
- D. Contaminated bedding, trash and carcasses from animal facility containments.
- Contaminated bedding **MUST** be autoclaved at the site of containment and then boxed for pickup by OEHRs.

Standard Operating Procedure 4.01

Transporting Animals to CRB 703, 716D and 717

- I. **Purpose:** This policy describes procedures, which must be followed when transporting laboratory animals within buildings on the Philadelphia campus of the University of Pennsylvania. The purpose of this policy is detail the proper procedure for transporting and moving animals for imaging studies at the Mouse Phenotyping, Physiology and Metabolic Core (MPPM). Adherence to the procedures will reduce the potential exposure to possible allergens and zoonotic diseases to persons in public areas and MPPM.
- II. **Responsibilities and Scope:** All principal investigators (PI) are responsible for being familiar with this policy and assuring that their staff/ technicians adhere to it when transporting laboratory animals in public areas. In addition, all animal researchers who are involved in imaging studies at the MPPM are responsible for reading and following this SOP.
- III. **Definitions:**
 - A. **High Risk Animals**-Animals, which are at relatively high risk of carrying potentially zoonotic disease. This category includes any animal known or suspected to be infected with human pathogens (nonhuman primates and sheep).
 - B. **Filtered Transport Cages**-Any container used to confine the animal and which prevents animal excrement and non-filtered air from leaving the cage.
 - C. **Transport cage**-Any container used to confine animals during transport.

D. Public Areas-Any area outside of the animal facility or the laboratory in which the animal is used.

IV. Procedures:

- A. Prior to the transfer of animals from the Penn animal facilities (i.e., transport from the CRB animal facility to CRB 703, 716D or 717), the Principal Investigator (P.I.) must sign a service form and coordinate with Ravindra Dhir (215-573-1873) an arrival time.
- B. Service request forms can be downloaded from: .
http://www.med.upenn.edu/idom/derc/cores_mouse.html
- C. As indicated in the request form, by signing the form, the PI agrees to euthanize animals as per their protocol once metabolic assessment is completed by the MPPM.
- D. Sanitation-When any body fluids (blood, urine, saliva), feces, or cage litter contacts any surface outside the cage, it must immediately be picked up and the area cleaned and sanitized with an appropriate sanitizing agent.
- E. Caging Requirements-Any animal transported in a corridor outside the animal facility must be transported in a filtered transport cage. All animals must be confined in transport cages while en route. "High Risk" animals are not accepted by the MPPM.
- G. Routing-The animals must be transported over the most expeditious route available. In selecting the route, care should be taken to utilize the least congested areas.

V. Directions:

None

VI. Safety Considerations:

- A. Animals must be transported over the most expeditious route available while the utilizing the least congested areas.
- B. Live animals must be transported in covered containers and not visible to patients, visitors and staff. This serves to reduce the public exposure to allergens and other health risks. It also reduces the stress to the animals.
- C. Public passenger elevators should be avoided if and when possible (Freight elevators are preferred). Hallways are public and as such any movement of animals to a lab in these areas should be discrete and unobtrusive.
- D. Drape cart with a cloth to ensure animals and cages are shielded from public view.
- E. Transporting animals implanted with human tumor cells from the animal facility must be in accordance with the following guidelines:

1. Animals should be transported in filter-top cages on appropriate carts. Ensure that the lids are secure (use tape to attach lid to the cage).
2. The cages must be placed in a second rigid, sealed, watertight container and transported on a cart with sides. Sufficient absorbent should be added to the second container to soak up contents in case of leakage.
3. Whenever possible, place cages on the second lower tiers of the cart, and leave the top shelf to support the weight of drape.
4. Avoid stacking cages, since it decreases air circulation through the filter tops and leads to instability on the cart.
5. For a single animal cage, place the cage inside a separate container. Then, drape the container with an opaque cloth and carry the container by hand (under the arm) from the Penn animal facilities to the Founders Basement-MRI animal preparation room for imaging studies.
6. Containers, cages, carts, etc. must be wiped down with an appropriate disinfectant and appropriate decontaminant. Disposal protocols for all infectious materials must be followed.
7. Ensure that appropriate precautions are taken when handling animal blood and body fluids, by wearing latex gloves. For cleaning areas contaminated by blood and body fluids, we recommend using sodium hypochlorite (bleach) in a 1:10 dilute solution (one part bleach to nine parts water) or virucidal agents to clean contaminated environmental surfaces.

VII. References:

- A. Guideline #16 (6/23/99): Penn-IACUC Guideline for Transportation of Laboratory Animals- Philadelphia Campus
- B. Penn-ULAR-SOP[#] 4.21. Transport of Laboratory Rodents-Philadelphia Campus (updated version is available as of July 19, 2005).

VIII. Attachments:

None

Standard Operating Procedure 4.02

Animal Acceptance Procedures into CRB Rooms 703, 716D and 717

I. Purpose: The purpose of this SOP is to outline the entry procedures for the animal rooms in CRB for the metabolic studies at the Mouse Phenotyping, Physiology and Metabolic Core (MPPM).

II. Responsibilities and Scope: All researchers who are involved in animal imaging studies at the MPPM are responsible for reading and following this SOP.

III. Definitions:

None

IV. Procedures:

A. Animal room in CRB 703, 716D and 717:

1. Only animals from IACUC approved protocols are allowed into CRB 716D and 717.
2. In a 24 hour period only animals from only one investigator are allowed in CRB 703, 716D and 717. New animals can be brought in only after all work surfaces and equipment are properly sanitized.
3. Researchers who plan to use the animal preparation room for their animal studies must wear protective clothing (gown, gloves, mask, shoe covers, and bouffant cap). As long as the researchers are performing imaging studies with live animals, researchers must wear protective clothing. However, when the animal is placed in the imaging devices or CLAMS cages, researchers must remove their protective clothing to avoid contamination to the consoles, computers and other equipment.
4. Prior to opening the animal cages, protective clothing must be worn in the animal preparation room. Protective clothing will be located just inside the animal preparation room.
5. All researchers must follow the SOP concerning the transporting and moving of animals for metabolic (refer to SOP #4.01).
6. Close the door of the animal preparation room.
7. Spray disinfectant on all the cages that will be transported from the animal facilities (i.e., Stemmler, CRB, Richards).
8. All researchers must disinfect the work surfaces prior to placing one of the transported animal cages containing live animals.
9. Cover work surfaces with absorbent pads and tape to avoid any movement of absorbent pads.
10. Prior to using the core for metabolic studies, all researchers must fully understand their experimental procedures as approved by the Penn-IACUC.

Standard Operating Procedure 5.01

Operational Deficiencies and Repeat Violations

I. Purpose: The purpose is to provide the policy when dealing with operational deficiencies and repeat violations of established SOPs during the imaging studies at the Mouse Phenotyping, Physiology and Metabolic Core (MPPM).

II. Responsibilities and Scope: All researchers who are involved in animal imaging studies at the MPPM are responsible for reading and following this SOP. To reduce conflicts with researchers, the principal responsibility will belong to the Principal Investigators (P.I.) and not their associates, post-docs, and technicians.

III. Definitions:

None

IV. Procedures:

- A. The technical director of the core has the authority to supervise and police all animal metabolic studies at the facilities to minimize operational deficiencies and any violations of established protocols.
- B. The departmental official must report the circumstances and actions taken in the following instances:
 1. Any serious or continuing noncompliance with PHS Policy
 2. Any serious deviation from the provision of the Guide
 3. Any suspension of activity by the IACUC
- C. The following guidelines will be used to identify incidents of serious noncompliance. These violations will be reported to the Penn-IACUC through the technical director. A serious incident of noncompliance is understood as one where the welfare of animals or personnel is jeopardized.

V. Directions:

- A. If a repeat violation occurs and the second violation has been documented, the subsequent incident will be reported by the technical director to the PI. A "Three strikes" rule will be applied for all researchers.
- B. The following examples should not occur under any circumstances:
 1. The use of animals without IACUC approval
 2. Failure to use aseptic procedures during survival surgery on experimental animals prior to imaging studies
 3. Failure to correct previously identified noncompliant or questionable procedures
 4. Housing of animals outside the University of Pennsylvania animal facilities without IACUC approval for more than 12 hours
 5. Personnel performing surgical procedures without proper supervision when special training requirements are not met

6. Major modifications of an approved protocol without prior IACUC approval
 7. Failure to alleviate pain or distress of an animal when the exception has not been approved by the IACUC
 8. Failure to confirm the death of euthanized animals
 9. Failure to log the required information on the sign-up schedule sheet in a timely manner (i.e., prior to use of any animal rooms for metabolic studies)
 10. Failure to clean the animal rooms after use
 11. Failure to follow the proper protocols on the transporting and moving of animals for imaging studies (refer to “MPPM-SOP[#] 4.01”)
- C: To reduce conflicts with researchers the principal responsibility will belong to the Principal Investigators and not their associates, post-docs, and technicians. A “three strikes” rule will be applied to all Principal Investigators. Principal Investigators’ privilege to use the Penn-DERC MPPM facilities and animal preparation rooms for their animal studies will be revoked by the departmental official. Moreover, the most recent violation will be reported to the Penn-IACUC. This may lead to immediate termination of the violators’ animal studies. Proper warning will be given if a violation has occurred. In all cases, the PI will review the violations after two-strikes.

VI. Safety Considerations:

None

VII. References:

None

VIII. Attachments:

None

Standard Operating Procedure 5.02

Handling Guidelines for Drug Enforcement Administration (DEA) Controlled Substances

-
- I. Purpose:** Guidelines for handling Drug Enforcement Administration (DEA) controlled substances during imaging studies at the Mouse Phenotyping, Physiology and Metabolic Core (MPPM).
 - II. Responsibilities and Scope:** All researchers who are involved in animal imaging studies at the MPPM are responsible for reading and following this SOP. To reduce conflict with researchers, the principal responsibility will

belong to the Principal Investigators (P.I.) and not their associates, post-docs, and technicians.

III. Definitions:

None

IV. Procedures:

A. No expired medical substances including DEA-controlled substances are allowed at the MPPM.

1. All chemicals and drugs including DEA controlled substances used at the MPPM must have a label with the expiration date and readable identification of the user's name.
2. The use of expired medical substances such as chemicals, drugs, fluids, or sutures on regulated animals is not acceptable under any conditions.
3. All expired medical materials found in our MPPM will be brought to the attention of the responsible departmental official. The PI is ultimately responsible if such an event were to occur. Ignorance is no excuse
4. The departmental official (i.e., Director of Animal Studies) of MPPM will dispose of all expired materials and inform of the citation to the PI.
5. Proper administration of anesthesia, analgesia, and euthanasia are required for all such procedures. Drugs administered to relieve pain or distress and emergency drugs must not be used beyond their expiration date.
5. Any drugs not to be used for animals should indicate "not for animal use".

B. Pharmaceutical-grade products are accepted for the animal research at MPPM.

1. All animal researchers are expected to use pharmaceutical-grade medications whenever they are available including acute procedure.
2. Non-pharmaceutical-grade products should be only used in regulated animals after specific review and approval by the IACUC.
3. In case of non-availability of veterinary or human pharmaceutical-grade products, PI must obtain prior written approval from ULAR (Abigail Smith, Tel: 215-898-4008, email: abigail4@pobox.upenn.edu) and the Animal Oversight Subcommittee of the MPPM.
4. Cost-saving alone is not an adequate justification for the use of non-pharmaceutical-grade products in regulated animals.

V. Directions:

None

VI. Safety Considerations:

None

VII. References:

A. USDA-Veterinary Care and Penn-IACUC: Animal Care Resources Guide
Guidelines (updated on 1/14/2000).

VIII. Attachments:

None