

Animal User Manual

Laboratory Animal Facility,

The Hong Kong University of Science and
Technology

(2023)

About LAF

The Laboratory Animal Facility of The Hong Kong University of Science and Technology (LAF, HKUST) was established to provide humane care and husbandry to animals for HKUST-approved experiments.

All animals in the facility receive high standard of health care and humane treatment, meeting the standards of the Code of Practice for Care and Use of Animals for Experimental Purposes (AFCD, HK Gov). Prior to conduction of any experiment, all Animal Use Protocols are reviewed by the Animal Ethics Committee (AEC), which is authorized by the university's Office of the Vice-President for Research and Development (VP-RDO).

More information about LAF, services, practices and compliances is available from the LAF web site (<http://apcf.newsletter.ust.hk/>) and enquiries can be made via email (apcf@ust.hk) or phone (23588201 or 34692509).

Animal Facilities

The 7L and 7H are barrier facilities housing laboratory animals. The barriers are protected from outside contaminants using PPE and the appropriate entry procedures. Materials and equipment (including all caging equipment) are sterilized or disinfected via pass-through autoclaves, a vaporized hydrogen peroxide decontamination chamber or by manual surface disinfectant treatment, whichever being compatible with the items with the highest disinfection efficiency. All mice are housed in individually ventilated cages (IVCs) and manipulated inside biological safety cabinets or animal transfer stations.

The facility is composed of a higher biosecured L-A1 barrier for breeding and production only and a medium biosecured barrier, L-A2 and H, for experimental mouse, rat breeding, mouse, rat and rabbit holding and experimentation. In all barriers, individually ventilated cage systems are used for better biocontainment and biosecurity practices. Automatic drinking watering system is used in 7L to feed the animals with purified and chlorinated water. The same quality of drinking water in bottles are used in 7H.

Services

Besides animal holding and maintaining facilities for animal research, LAF provides a wide range of services including animal breeding and supply, animal importation, quarantine, colony management procedures, genetic modifications, experimentation assistance and drug prescription according to the approved Protocols, etc. Service details are available in the [LAF Service Manual](#). Requisition can be made via the [LAF Service Request Form](#).

1. Guide to be an animal user in HKUST

Before a user can independently handle any laboratory animal in HKUST, the following procedures must be completed. Please visit [Before Gaining Access to LAF](#) in LAF website for a detail guidance on the requirement and compliance one should meet before conducting animal experiments. The requirement and compliance include the following.

- 1.1. Animal License to complying to Cap 340: Animals (Control of Experiments) Ordinance
- 1.2. Enroll to Occupational Health Assessment and Medical Surveillance
- 1.3. Animal Use Protocol approval
- 1.4. LAF user training

IMPORTANT NOTES:

Users are responsible for complying with Hong Kong legislation (1.1), university policy (1.2 and 1.3), and for keeping track of the respective expiration dates.

2. User training

- 2.1. It is the Principal Investigator's obligation to ensure the personnel is competent in performing animal procedures.
- 2.2. LAF provides a mandatory self-learning program (visit [Gaining Access to LAF](#) in LAF website) and basic hands-on training during facility orientation before granting facility access to a new user.
- 2.3. Training on project-specific techniques should be arranged by the Principal Investigators. Competency of the trainees on performing such animal procedures should be documented in the laboratory and declared in the Animal Use Protocol application.
- 2.4. If available, training on special techniques may be provided by LAF upon request.
- 2.5. Various training materials and links are available on the [LAF Webpage](#) (under Learning tag) for users' reference.

3. Facility security control

- 3.1. The main doors of all facilities are controlled by a wristband-locking system. LAF will grant users' wristband access to the relevant barrier after all necessary procedures, including LAF user training, and documents are completed, as stated in Section 1.
- 3.2. To record each entry event, all users must swipe their wristbands on the readers even when the door has been opened by another person.
- 3.3. LAF wristband must not be used by any person other than its official owner in entering LAF.
- 3.4. The use of other's wristband to get access into LAF, or bringing a second person into

LAF, will be considered a serious security breach. Both the wristband's owner and the unauthorised user of the wristband may be suspended from entering LAF. If required, depending on the severity of the event, HKUST security office or Hong Kong Police Force will be notified.

4. Biosecurity control on personnel entries

- 4.1. LAF facilities are classified according to the health statuses of the animals in the respective facilities.
- 4.2. Once visited another animal facility within 24hr, he/she must not visit any LAF animal facility.
- 4.3. When one need to visit two or more LAF facilities within 24 hr, he/she must strictly follow the barrier flow, from higher to lower barrier. (i.e., 7L-A1 barrier → 7L-A2 barrier → 7H barrier).
- 4.4. A separation time of 24 hours is required to visit the LAF barriers in reverse sequence (i.e., 7H barrier → 24hr → 7L-A2 barrier → 24hr → 7L-A1 barrier).
- 4.5. During the 24hr separation time, a thorough showering and change of clothes are expected.
- 4.6. If, under exceptional circumstances, one needs to visit a higher barrier after visiting a lower barrier within 24hr, he/she must request approval from LAF in advance. LAF may arrange him/her a shower including hair washing in an LAF facility and don a new set of facility clothing between the visits.
- 4.7. As a biosecurity measure, LAF staff reserves the authority to ban entry of any user suspected to have breached this cleanup procedure. A user is highly recommended to seek help from his/her colleagues or LAF staff to complete his/her task if conflict of the facility entry policy is encountered.
- 4.8. To avoid travelling between different LAF barriers, research groups should assign separate personnel to different barriers whenever possible.

5. Facility entry procedures

- 5.1. In general, the facility entry procedures include (not in order): proper disinfection of items to be used in the animal caring area, handwashing, putting on PPE and putting on shoe covers. Please strictly follow the instructions given during the LAF's facility orientation to prevent introducing contaminants into the facilities.
- 5.2. In case of a disease outbreak, enhanced facility and room entering procedures will be implemented. Please note the most current animal rooms entry sequence posted in the lobby and in circulars/emails.

6. General practices in the animal facilities

- 6.1. Wearing of gloves is required within the barriers. Hands must be sprayed with alcohol provided before and after direct manipulation of animals and between handling different cages.
- 6.2. Any items in personal clothing pockets (i.e., beneath the PPE) or in disinfected plastic bag, must not be taken out. Contacting any non-disinfected items will bring contaminants into the animal caring area, thus risking the health of the animals and breaching biosecurity.
- 6.3. Mobile phones should be turned silent or low ring volume and should be kept in sanitized plastic bags available in gowning rooms.
- 6.4. Music and video entertainment are strictly not allowed.

7. Restricted areas

- 7.1. Users are welcomed to work in the animal room housing his/her animals only. Animal rooms not housing a user's animals are restricted areas for that user.
- 7.2. A user must conduct AEC approved procedures in the operating room and euthanize animals in the dedicated euthanasia areas. Other areas, such as the clean storage, bedding dispensing, diet storage cage washing rooms, decontamination room and water treatment room are limited to designated LAF staff only.

8. Use of Procedure/Operation/Surgery rooms

- 8.1. Surgery Room users must comply with the safety rules explained during the facility orientation and receive specific training before using specific equipment, including the gas anesthesia machine, dangerous drugs and sharps.
- 8.2. Upon user's request, LAF staff can provide the necessary assistance during the reserved period, including but not limited to colony management procedures, blood drawing and giving injections. If required, anesthetics will be prescribed upon request from the LAF Veterinary Team.
- 8.3. Materials to be applied on the laboratory animals should be prepared aseptically. Handling hazardous material, e.g., viral vectors and estrogen receptor antagonist for genetic manipulation must be done with the corresponding containment levels.
- 8.4. Sharp items must be disposed properly into a designated sharps container.
- 8.5. The working surfaces must be tidied and cleaned every time after used.
- 8.6. Only one research group can use a Surgery room at a time.
- 8.7. Procedure rooms supply disposable transportation boxes for bringing mice away from LAF to satellite facilities. Users must transfer the animals to the transportation boxes within the biosafety cabinet using strict biocontainment practices.

8.8. Procedure rooms also supply plastic bags and freezers for the disposal of animal carcasses. Once death is confirmed, users must transfer the euthanized animals into the bags within a biosafety cabinet or animal transfer station using strict biocontainment practices. No opening of animal cage is allowed in the euthanasia area.

9. Use of animal holding rooms

9.1. Cage space for each user group must be allocated by LAF. Please fill in the LAF Service Request Form and return to apcf@ust.hk for approval.

9.2. Animals are held in designated cage racks inside the animal rooms only. Shuffling of cages between different racks is not advised due to the facility's rack-base health monitoring program. Our staff in-charge of the room must be notified about the transfer of cages to different racks.

9.3. Animals must not be transferred between animal rooms without permission. Please seek consultation from LAF before doing so.

9.4. Only simple cage handlings, i.e., set mating and regrouping of animals, are done in the animal rooms inside an operating animal transfer station or a biosafety cabinet. Invasive procedures, including injections, must be done in the procedure/operation rooms.

9.5. Mice must be handled in the biological safety cabinet or the animal transfer station using strict biocontainment practices. Exceptions might be given to experimental procedures involving specific surgery and behavior test requirements in designated rooms. Training videos on such procedures produced by LAF are available on the LAF webpage (Learning > Videos > Mouse Manipulation in LAF barrier facility).

9.6. Animals that have undergone invasive procedures (survival and are under anesthesia) should be flagged with a surgery notification (green) card indicating the corresponding AEC approved Protocol number, procedure performed date and description, anesthesia used, analgesia regime, the expected consequence on the well-being of the animals (post-operative monitoring), and any assistance you might need from our facility's veterinary technical staffs.

10. Animal Welfare Notification/Alert System.

- 10.1. The following Notification/Alert System is applied to ensure ethical standards and guidelines on animal care and use are followed.
- 10.2. LAF reserves the right to handle all animals in the facility for animal well-being considerations. This includes euthanizing animals in overcrowded cages and those that are in irreversible pain or distress (which are not the unavoidable consequences specified in the corresponding approved Protocols) without notifying the users.

Email	Aims	From	To
Level 1	<ul style="list-style-type: none"> • Notifying the issue and specify severity • Clearly define precise time required for fixing • Suggest solution if appropriate • Issues may be documented with photo taking 	Vet Team	User
Level 2	<ul style="list-style-type: none"> • Warning, limiting the time to response • If not rectify on time, LAF may act on the animals to avoid welfare and legal infringement 	Vet Team	User
Level 3	<ul style="list-style-type: none"> • Notify the PI the situation • Declaring LAF have to rectify issues at users cost • AEC may be notified about the users' ignorance on the issue 	Attending Veterinarian	PI
Level 4	<ul style="list-style-type: none"> • Barring the entry of the offender • AV might take further action if required 	Attending Veterinarian	PI
Note	Offender repeatedly ignoring notifications regarding animal health and welfare issues will be notified directly at Level 2 or higher depending on the severity of the issues.		

11. Incident reporting

- 11.1. Concerns on welfare of animals can be reported to the Director of LAF or members of [AEC](#). If required, concerns can be reported anonymously. All reports will be handled in the strictest confidence.

12. Euthanizing laboratory animals

- 12.1. All personnel must be trained to perform euthanasia properly.
- 12.2. All personnel must follow *AVMA Guidelines for the Euthanasia of Animals: 2020 Edition* in performing euthanasia.
- 12.3. Upon requisition, LAF can provides training on euthanizing.

13. Handling mouse escape

- 13.1. Escaped animals should first be calmed before recapturing it.
- 13.2. Ask for assistance from any LAF staff once animal escape has occurred.
- 13.3. LAF veterinary staff must be notified when an animals has been dropped on the floor. Biosecurity issues will be considered prior to the subsequent arrangement for the concerned animals.

14. Animal bites and scratches

- 14.1. The proper training in animal handling, wearing gloves and the PPE, can minimize degree and chance of getting hurt by laboratory animal bites and scratches. Please note the proper restraint procedures for specific species prior to handling.
- 14.2. After being bitten, wash the wound immediately with running water for 5 minutes, disinfect the wound with diluted iodine and cover the wound with materials available from the first-aid box.
- 14.3. Notify LAF staff and your supervisor regarding the incident.
- 14.4. Depending on the severity of the wound, one may seek medical help. Seeking medical assistance for the risk of getting infectious disease is optional.
- 14.5. If possible, identify the involved animal, as it may be the subject of investigation.

15. Taking animals away from LAF

- 15.1. Mice to be taken away from LAF are put in designated transportation boxes available in the barriers.
- 15.2. The period of animal kept in the transport boxes should be as short as possible. The animals must be transferred to disposable cages in the laboratory if the animals are kept for an extended period.
- 15.3. In the laboratory, animals should be kept in a clean, quiet, and dim place. They should be kept away from electronic devices, which are likely to emit ultrasound waves that rodents are sensitive to.

- 15.4. All animals must be kept in an appropriate holding environment (i.e., with the appropriate air quality, temperature and humidity; with the proper light-dark cycle; free from odors, noise and minimal human activity disturbance, etc.).
- 15.5. Animals taken outside the facility are exposed to a higher risk of infection. These animals must not be returned to LAF barrier to avoid introduction of pathogens into the facilities.
- 15.6. Animal carcasses resulting from terminal procedures in the users' research laboratories should be returned and placed into designated freezers outside LAF facilities. The freezer security code can be obtained from LAF staff.

16. Mandatory Animal Record

- 16.1. HKUST has a collective responsibility to ensure that research practices are always carried out properly. The use of laboratory animals, including species and quantities, must be recorded accordingly. Tick@lab is a software used in HKUST to handle the research compliance.
- 16.2. All animals being kept and used by animal users must be recorded in Tick@lab.
- 16.3. Online tutorials and training materials are available on the [LAF website](#) for users to get familiar with the system.
- 16.4. Introduction to the system or for any queries on using Tick@lab, please contact LAF, apcf@ust.hk).
- 16.5. For Animal Ethic Protocol compliance issues, please contact VPRDO helpdesk via email (crphelpdesk@ust.hk).

17. Reporting Ethical Approval and Animal Welfare in Scientific Publications

As part of preparing a manuscript involving vertebrate studies, authors are required to state if their studies were approved by their local institution's animal ethics committee and if they followed local laws. The exact content requirement and style vary between journals.

Along with the experimental requirements for the animals and procedures, the following information should be included in the Materials and Methods section of the manuscript.

- 17.1. Describe basic information includes the international recognized strain nomenclature (naming), animal source, animal holding facility and Institutional research compliance information. Example:

Mouse strain Bmp4^{fl_{ox}neo} (B6;129S4-Bmp4^{tm1Jfm}/J) were obtained from The Jackson Laboratory (Strain #:016878) and maintained in the Laboratory Animal Facility at the Hong Kong University of Science and Technology (HKUST). C57BL/6J were obtained from Laboratory Animal Facility at HKUST. All experimental uses of laboratory animals were approved by the Animal Ethic Committee of the HKUST (AEP no. 123456).

17.2. When appropriate, the microbiological status and the animal holding environmental factors should be described as well. Example:

All mice were free of xxx, xx, xxx ...(please obtain the pathogen exclusion list for the corresponding animal holding room from LAF). The mice were maintained in an animal room with 12 h light/12 h dark cycles, room temperature kept at 20–24 °C, with relative humidity of 30–70%.