



香港浸會大學
HONG KONG BAPTIST UNIVERSITY

Safety Guidelines for Rearing and Experimentation of Laboratory Animals

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1. Introduction

The scope of animal research has been expanding and the rapid development of new technologies within the industry has led to increases in the social attention to the welfare of research animals. The purpose of the Safety Guidelines for Rearing and Experimentation of Laboratory Animals (the Guideline) is to assist laboratory users in caring and using laboratory animals in a healthy and safe manner at Hong Kong Baptist University (HKBU).

This Guideline aims to assist the investigators in fulfilling their obligation to plan and conduct animal experiments in accordance with the highest scientific, humane and ethical principles. The recommendations in the Guideline are based on publications, scientific principles, expert opinion and international standards which are considered to be practicable and suitable references, for conducting high-quality research and to ensure the humane care of laboratory animals used for experimental purposes. It also intends to assist relevant departments and faculties to meet their duty of care, in order to provide a healthy and safe workplace as far as reasonably practicable. It is the responsibility of every laboratory user who works with laboratory animals to understand and follow the Guideline. It is required to ensure that all safety requirements and administrative procedures are strictly followed throughout the operation.

The Committee on the Use of Human and Animal Subjects in Teaching and Research is comprised of representatives from more than 10 departments included health and safety professionals, research scientists, professors of science faculty and non-scientists representing ethical concerns and public awareness in animal welfare. The Committee members were appointed by the University for evaluating all applications for animal experiments. This assures protection of the rights and welfare of persons participating in the research, and also to ensure that all potential hazards as known by the investigators have been disclosed and that acceptable safety measures will be implemented. For areas that are not covered by the Guideline, professional recommendations could be sought through consultation with the University Advisor on the Use of Laboratory Animals on Research, Dr. Joshua K.S. KO (the School of Chinese Medicine).

1.1 Mandatory requirements

1.1.1 Supervisors are responsible for the followings:

- Ensure laboratory users who require working with laboratory animals to have attended appropriate training(s);
- Assess individuals' competence to work with laboratory animals properly and safely; and
- Provide appropriate and adequate personal protective equipment and instruction.

1.1.2 Laboratory users who require working with laboratory animals should have:

- Completed appropriate training(s) and have been considered competent to handle the work by their direct supervisor(s);
- Submitted an ethical review to the Committee on the Use of Human and Animal Subjects in Teaching and Research; and
- Granted University's approval and relevant licence(s) as required by the Hong Kong Government before participating in any animal-related activities in the laboratory. (Please refer to [Section 3](#) and [Section 5](#))

1.1.3 Laboratory users must not bring the following items to animal housing facilities:

- Animals from unknown/unauthorised source (dead or alive);
- Animal organs, tissues or body fluids from outside;
- Unauthorised equipment and inappropriate clothing; or
- Other items that might have been contaminated (e.g. by animal contact from outside the animal housing facilities).

1.1.4 All laboratory animals should be transported directly from “certified” laboratory animal breeding and rearing units (e.g. laboratory animal services units of the Chinese University of Hong Kong, Hong Kong University of Science and Technology and University of Hong Kong, or other professional laboratory animal supply companies such as Charles River Laboratories and The Jackson Laboratory) to the animal housing facilities. The approved types of laboratory animal for research studies in HKBU:

- Mice;
- Rats;
- Guinea pigs; and
- Rabbits.

2. Operation

2.1 General safety

- 2.1.1 The University Laboratory Safety Manual should be followed for the entire operation.
- 2.1.2 Eating, drinking or wearing contact lenses should be avoided in animal housing facilities.
- 2.1.3 Appropriate personal protective equipment (PPE) such as laboratory coat and gloves should be worn and retained for the use within animal housing facilities; anti-bite gloves should be included when necessary.
- 2.1.4 Instructions for instrument operations, laboratory animals/materials handling as well as the procedures of cleaning and disinfection for all working area and instruments should be available and such information should be clearly indicated.
- 2.1.5 Animal handlers should be trained in animal handling techniques before conducting experiments to avoid incidents such as animal attacks; supervision should be provided for new handlers. Training records should be accessible.
- 2.1.6 Procedures should be carefully designed to minimise the possibility of creating splashes or aerosols; Biological safety cabinet should be used, when necessary.
- 2.1.7 Access right to animal housing facilities should be obtained from relevant person-in-charge before the commencement of operations.
- 2.1.8 Vaccination should be considered before the operation if needed.
- 2.1.9 Standard precautionary measures should be strictly followed for the entire operation. Hand and respiratory hygienic practices should be included in these precautionary measures, especially after contacting laboratory animals.
- 2.1.10 Emergency procedures and the operation of emergency equipment should be familiarised before the commencement of operation. ([Section 4](#))
- 2.1.11 Before entering the individually ventilated cages room (if any), all laboratory users must put on the supplied gowns, protective cap, shoe cover, facemasks and gloves specific for the room. This room houses the individually ventilated cages for immunocompromised animals and must be kept as a “Minimum Contagious Area”.
- 2.1.12 Assisting tools such as trolley should be used when transferring heavy laboratory animals or materials.
- 2.1.13 Incident including but not limited to bite, scratch or kick should be reported as soon as practicable to laboratory supervisor; medical advice should be sought when necessary.
- 2.1.14 There are different kinds of harms associated with experiments involving laboratory animals and they can be divided into four categories including physical, chemical, biological and radiation. The information on the associated hazards is outlined in [Annex 1](#).

2.1.15 Laboratory user is required to obtain prior approval from relevant supervisor(s) through the standard procedure for any activities after office hours or during holidays in the animal housing facilities. (Please refer to the Laboratory Safety Manual for more details)

2.2 Handling of sharps

- 2.2.1 Mechanical aids such as tongs or forceps should be used when handling sharps.
- 2.2.2 Sharps such as needle, scalpel, broken glass, syringes or glass pipette should be disposed of in a sharps box immediately after use.
- 2.2.3 Mixing contaminated sharps with ordinary waste should be avoided.
- 2.2.4 Needles should be refrained from being bent, sheared, broke or recapped prior to disposal.
- 2.2.5 Sharps box should be avoided from overfilling materials.

2.3 Handling of laboratory animals

- 2.3.1 Relevant approval and animal experiment licence(s) should be obtained prior to operation.
- 2.3.2 Laboratory animals from trusted sources should be used; wild-caught animals, which might induce more hazard than laboratory-bred animals, should be avoided.
- 2.3.3 Nature of animals such as flight-zone should be understood to avoid the animal attack.
- 2.3.4 Outside animals, specimen, unauthorised equipment and clothing should be refrained from entering animal housing facilities to prevent infection.
- 2.3.5 Person-in-charge of animal housing facilities should be informed for or after obtaining laboratory animals.
- 2.3.6 Restrainer should be used when necessary.
- 2.3.7 All animal cages should be locked properly to avoid escape of laboratory animals.
- 2.3.8 All cages with laboratory animals should be covered properly during transfer.
- 2.3.9 The setting of lighting, air-conditioning, humidity and relevant equipment should be avoided from alternation; auxiliary lighting should be used if necessary.
- 2.3.10 Barricade should be used, if necessary, at the entrance to prevent the escape of laboratory animals.
- 2.3.11 Laboratory animals should be quarantined before re-entering animal housing facilities, if necessary.
- 2.3.12 Animal carcasses should be disposed of as group three bio-medical wastes in accordance with the requirements stipulated in the “Code of Practice for the Management of Clinical Waste for Waste Producers” published by the Environmental Protection Department.

2.4 Handling of biological materials

- 2.4.1 Standard biological safety procedures in accordance with the “Code of Practice Care and Use of Animals for Experimental Purposes” by the Agriculture, Fisheries and Conservation Department, Hong Kong Government, should be strictly followed.
- 2.4.2 Class II or higher biological safety cabinet adhering to a relevant level of biological safety practices should be exercised when handling samples with the aerosol generation or corresponding agents.
- 2.4.3 Germicidal lamps, if any, should be turned off when entering the experimental areas.

- 2.4.4 Instructions for instrument operations, materials handling as well as the procedures of cleaning and disinfection for all working areas and instruments should be available and such information should be clearly indicated.
- 2.4.5 Working area should be cleaned up or decontaminated after finishing work or spillage.
- 2.4.6 Bio-medical wastes should be segregated, labelled, stored and disposed of in accordance with the requirements stipulated in the “Code of Practice for the Management of Clinical Waste for Waste Producers” published by the Environmental Protection Department.

2.5 Handling of chemicals

- 2.5.1 Standard chemical safety procedures in accordance with the Laboratory Safety Manual of HKBU should be strictly followed.
- 2.5.2 Chemicals should only be stored in designated cabinets; incompatible chemicals should be prevented from storing and disposing of together.
- 2.5.3 Fume cupboard or local exhaust system should be used when handling chemicals.
- 2.5.4 Secondary containment should be used when transferring chemicals from one area to another.
- 2.5.5 Chemical wastes should be segregated, labelled, stored and disposed of in accordance with the requirement stipulated in the “Waste Disposal (Chemical Waste) (General) Regulation” and disposal procedures as specified in the Laboratory Safety Manual of HKBU.

3. Legislative control of the use of laboratory animals and other controlled substances

3.1 Regulatory requirements and code of practice

- 3.1.1 All experiments must fulfill all relevant legislation and Codes of Practice in Hong Kong, including, but not limited to:
 - Animals (Control of Experiments) Ordinance, Cap. 340;
 - Prevention of Cruelty to Animals Ordinance, Cap. 169;
 - Dangerous Drugs Ordinance, Cap. 134;
 - Antibiotics Ordinance, Cap. 137;
 - Pharmacy and Poisons Ordinance, Cap. 138;
 - Public Health (Animals and Birds) Ordinance, Cap. 139;
 - Animals and Plants (Protection of Endangered Species) Ordinance, Cap. 187;
 - Radiation Ordinance, Cap. 303;
 - Occupational Safety and Health Ordinance, Cap. 509;
 - Code of Practice for the Welfare of Food Animals, Food and Environmental Hygiene Department; and
 - Code of Practice Care and Use of Animals for Experimental Purposes” by the Agriculture, Fisheries and Conservation Department.
- 3.1.2 Relevant licences should be obtained from the Department of Health, Hong Kong Government, for possessing controlled drugs, radioactive substances and/or irradiating apparatus prior to the commencement of experiment or procurement of controlled substances.
- 3.1.3 All procedures related to radioactive substances should be performed in a licensed radiation laboratory.
- 3.1.4 An operator licence should be obtained from the Radiation Board of Department of Health, Hong Kong Government, to work with an open-beam irradiating apparatus.
- 3.1.5 The record for procurement of controlled drugs and/or radioactive substances should be kept properly.

3.1.6 Radioactive substances-treated animals including their excretions and carcasses should be considered as radioactive.

4. **Emergency response**

4.1 **Emergency incidents**

4.1.1 In case of any emergency incidents such as toxic chemical-related accidents or serious physical injuries, notify all personnel in the immediate area.

4.1.2 Activate the emergency alarm system (if any) and/or contact the campus security. If necessary, evacuate from the animal housing facilities immediately and report to the campus security and inform relevant supervisor(s).

(For further information: <http://ehsu.hkbu.edu.hk/EmergencyProcedure.pdf>)

4.1.3 For all injuries incurred when working with laboratory animals:

- Wash injured site with soap and water for at least five minutes;
- Cover wound with a clean bandage;
- Apply direct pressure to control bleeding; and
- Seek medical advice from the University Health Service, clinic or Accident and Emergency Department of hospital.

4.2 **Emergency contacts**

Department/ Office	Extension number *
Campus security (24 hours)	7777
Environmental Health and Safety Section, Estates Office	7997
Animal House of School of Chinese Medicine	2469
Animal House of Department of Biology	7062
Animal House of Faculty of Science	7644

* Dial 3411 before the 4-digit extension when you place the call with your mobile phone

* Dial 9 before you place the call to an off-campus number with a campus telephone

* Telephone number for emergency services throughout Hong Kong is 999

5. **Licences application**

According to the Animals (Control of Experiments) Ordinance, Chapter 340, all personnel including faculties, research assistant professors, postdoctoral fellows, and postgraduate students who perform animal experiments must have obtained a License to Conduct Experiments issued by Department of Health. Please complete relevant applications as listed below in order to fulfil both HKBU and local regulatory requirements prior to carrying out any animal-related research in the University:

- Informed consent statement and application to the Committee on the Use of Human and Animal Subjects in Teaching & Research:
http://gs.hkbu.edu.hk/en/home/download/for_current_students/
- ⁽¹⁾Application for animal experiment licence via the Department of Health, Hong Kong Government: http://www.dh.gov.hk/english/useful/useful_forms/useful_forms_ani.html
- Licence application via the Radiation Board of Hong Kong (if requires the import, export, possession and use of radioactive substances and/or irradiating apparatus):
<http://www.rbhk.org.hk/eng/forms-fees.html>
- Other licence/permit applications: it is required to ensure all relevant licence/permit(s) is obtained in compliance with the regulation(s) in Hong Kong. Please contact Environmental Health and Safety Section (EHS) for further information if it is necessary.

⁽¹⁾ The Animals (Control of Experiments) Regulations stipulate that every licensee shall keep records of all licensed experiments performed by him/her in the form set out as Form 6 (Record of Experiments) and shall render to the Director of Health on or before the first

day of January of each year a return in the form set out as Form 7 (Return of Experiments) of all licensed experiments performed by him/her during the preceding 12 months. Thus, a nil return is required even if no experiment has been performed during the period.

6. References

- i. Laboratory Safety Manual, Hong Kong Baptist University, 2015.
- ii. Code of Practice, Care and Use of Animals for Experimental Purposes, Agriculture, Fisheries and Conservation Department, Hong Kong, 2004.
- iii. Guide to Application for Licence under the Animals (Control of Experiments) Ordinance
- iv. Occupational Health and Safety in the Care and Use of Research Animals, National Academy Press, Washington, DC, 1997.
- v. Guide for the Care and Use of Laboratory Animals, 8th Ed., The National Academies Press, Washington, D. C., 2011.
- vi. Guidance Notes on Manual Handling Operations, Occupational Safety and Health Branch, Labour Department, Hong Kong, 2003.

Annex 1 – Potential risks associated with experiments involving laboratory animals

A. Physical hazards

A1 Physical injuries

Physical injuries include bites, scratches and kicks via animal contacts. When external factors such as sound or smell make animals frightened, such injuries to animal handlers may result. Improper handling of animals could induce discomfort, pain and distress, provoking animals to inflict injuries on its handler. Knowledge of animal behaviour or animals' 'flight zone' could reduce the risk of being harmed by animals. In order to protect researchers from being injured by animals, training on the correct method of handling animals, the use of appropriate personal protective equipment and restrainer or cage should be encouraged.

A2 Injuries by sharps

Sharps injuries refer to penetrating puncture wound from a needle, scalpel, broken glass, syringe, glass pipette or other sharp objects that may result in exposure to infectious agents and hazardous chemicals. Researchers should take care when using sharps. Sharps should always be disposed of directly into a sharps container immediately after use.

A3 Manual handling operations

Working with heavy animals or equipment (lifting and carrying cages, animals, and feed; bending and reaching clean cages, etc.) produces stress on muscles and joints. Such handling work is associated with a significant risk of muscular sprains/strain injuries (especially back pain), fractures and hernias. Researchers should use assisting tools when carrying heavy animals or equipment.

B. Chemical hazards

B1 Hazardous chemicals

Exposure to chemicals can cause acute or chronic health effects. Exposure to hazardous chemicals includes the use of disinfectants, anaesthetic agents, preserving agents, intentionally administration of toxic chemicals to animals and change of beddings. Researchers should consider using local exhaust system and wearing personal protective equipment during the application of chemicals. Materials safety data sheets should be consulted before handling of these chemicals.

B2 Drugs

In Hong Kong, the use of certain drugs such as ketamine is strictly controlled and governed by the Dangerous Drugs Ordinance, Chapter 134. Researchers who want to involve the use of dangerous drugs in their experiments should obtain relevant licence from the Department of Health, Hong Kong Government.

C. Biological hazards

C1 Zoonotic infection

Zoonosis refers to an infectious disease that is transmitted between humans and animals other than humans. Transmission routes include inhalation, inoculation, ingestion and contamination of skin and mucous membranes. Some zoonotic diseases are life-threatening or are rendered so in immunologically compromised individuals such as those suffering AIDS, receiving chemotherapy or undergoing steroid treatment.

With certain infections such as toxoplasmosis, the developing foetus can be deleteriously affected if the mother becomes infected during pregnancy. Some zoonotic infections produce symptoms that are indistinguishable clinically from other human diseases, with the development of flu-like symptoms, signs of intestinal upsets or skin disease. Researchers should ensure that their doctor is made aware of their occupation so that this can be taken into account in the differential diagnosis.

Typical examples of zoonosis include anthrax, brucellosis, E. coli 0157, rabies and dermatophytoses. Researchers should consider obtaining animals from trustable sources which are zoonosis-free and wear appropriate personal protective equipment when handling animals.

C2 Experimentally-induced infection

Experimentally-induced infection refers to the inoculation of microorganisms to experiment animals. The Biosafety Level of the infected animal should be considered as the same Biosafety Level of the infecting microorganism whichever is higher. Proper personal protective equipment, as well as corresponding biosafety operating procedures, should be employed.

C3 Allergies

Researchers in contact with animals may have frequent exposures to allergens in the form of dust, fibres and animal products (hair, fur, dander, urinary proteins, faeces and parasites). In susceptible individuals, this can lead to various degrees of laboratory animal allergy (LAA). Signs of the allergy include red, sore, watery or itchy eyes, running nose, sneezing, coughing, shortness of breath and skin rash. LAA may lead to Occupational Asthma (OA) if the primary symptoms are ignored. This type of asthma is work-caused. Once established, it will continue to be exacerbated by exposure to the trigger allergens.

The development of OA is related primarily to the length of exposure. However, it has been observed that those who have intermittent exposure for short periods of time can develop severe symptoms quite rapidly. An asthma attack will not necessarily occur at work. Frequently, shortness of breath will develop several hours after the exposure, e.g. at night.

In addition to those who develop work-caused asthma, researchers having asthma who begin employment in animal-related work have a high risk of developing work-aggravated asthma. Aggravation may also apply to other forms of respiratory illness. Researchers with OA who continue to work in an allergic or aggravating environment without adequate protection are at risk of their condition deteriorating over time. In such cases, they may continue to suffer from asthma even after their exposure is terminated. It is, therefore, important to note that personal protective equipment worn in animal housing facilities should not be worn elsewhere. Eating and/or drinking should be strictly prohibited inside the laboratories and animal housing facilities.

D. Radiation hazards

The import, export, possession and use of radioactive substances and irradiating apparatus in Hong Kong are governed by the Radiation Ordinance, Chapter 303. A licence for the above purpose from the Radiation Board is required for any person to carry out any activity involving radioactive substances or irradiating apparatus.

D1 Radioactive substances

‘Radioactive substances’, under Chapter 303, means any substance which consists of or contains any radioactive chemical element, whether natural or artificial and whose specific activity exceeds 75 Becquerel of parent radioactive chemical element per gram of substance. Radiation can pose hazards through inhalation, ingestion, skin contact or proximity to working personnel and people around. Therefore, researchers should consult EHS for working with radioactive substances.

D2 Ionising radiation

Ionising radiation can be classified as particulate and non-particulate. Particulate radiation is composed of particles that are of atomic origin. Alpha particles are charged particles that contain two neutrons and two protons. Beta particles are electrons emitted with very high energy from many radioisotopes. Alpha particles do not travel more than 1.3cm in the air and cannot penetrate the outer skin. The distance that beta particles can travel depends on their source. Beta particles are usually stopped by the skin but can cause serious damage to skin and eyes.

Non-particulate radiation includes x-rays and gamma rays. X-rays and gamma rays are electromagnetic radiation with very short wavelengths. They are photons of energy and can penetrate matters easily and are relatively difficult to shield. Irradiators and diagnostics x-ray machines are example sources of ionising radiation to working personnel in research laboratories. The operation of such instruments should be registered with the Radiation Board. Researchers should consult EHS for further information.