

# Health and Safety Information for those Working with Animals in the University of Hong Kong

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## Introduction

What follows has been adapted for use in Hong Kong University from information produced by the Health and Safety Department of the University of Edinburgh (with permission). This information is aimed at providing guidance to those who work with animals in the Laboratory Animal Unit (LAU) and satellite animal facilities in other departments, e.g. Pathology, Microbiology, Surgery, Zoology, including those in the planning phase as well as for other experimental areas where there is contact with animals. Some of the issues discussed are also relevant for field trips to obtain samples for screening and where animal carcasses may be brought onto university premises for microbial or pathological diagnostic procedures.

Those who work with animals must be aware of the risks of injury and ill-health to themselves, colleagues and the animals with which they work. There is a range of different hazards associated with animal work that vary according to the type of work undertaken. The most common are described in the pages following but there may be others that should be considered. Additional precautions may be required for specific work activities undertaken by researchers and these should be risk assessed by the PI and controlled as necessary.

Departments where animals are handled should develop their own local codes of practice that contain measures to address the specific hazards mentioned below as well as carrying out risk assessments to identify and control any further issues. For assistance please contact the Biological Safety Officer.

Suitable and adequate stocks of first aid materials, appropriate to the risks associated with the work in a particular area, must be provided and maintained. Work out of normal working hours (including shift work) is a feature of animal facilities and research in general. Local codes of practice must include rules to ensure workers are not employed in hazardous activities when alone, and that access to emergency assistance is always available.

## The Animals (Control of Experiments) Ordinance, Cap 340

The use of animals in experimental or other scientific procedures is regulated by the Animals (Control of Experiments) Ordinance, Cap 340, (1997). The provisions in this ordinance are directed at the protection of animals rather than the health and safety of the workers, which is dealt with by separate legislation under the Occupational Safety and Health Ordinance, Cap

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509. However, since Cap 340 places rigorous controls on experimental work conducted on animals it is mentioned here because any considerations in relation to workers health and safety must also be in compliance with the requirements of the ordinance. Facilities, procedures and working practices must therefore be such that the various regulatory requirements are satisfied.

The Hong Kong Department of Health operates the licensing and inspection systems according to the Animals (Control of Experiments) Ordinance, Cap 340. Each person who undertakes animal work regulated by the ordinance must hold a valid license (unless procedures are only carried out after euthanasia –here CULATR will still need to give its approval).

The Committee on the Use of Laboratory Animals in Teaching and Research (CULATR) was established by the University in 1980 to advise the Senate and members of the teaching and research staff on various matters concerning animal experimentation. It determines whether the case for animal use is justified and ensures adherence to the principles of replacement, reduction and refinement. All experiments involving laboratory animals must be submitted to the committee for approval prior to the commencement of work. See [http://www.hku.hk/facmed/04research\\_animal.htm](http://www.hku.hk/facmed/04research_animal.htm) for more detail.

It is emphasized that the requirement for risk assessment(s) for worker's health and safety is separate to, and in addition to, any licensing requirements under the Animals (Control of Experiments) Ordinance Cap 340.

## Hazards Associated with Working with Animals

### 1. Physical Injury

There are various physical injuries that can arise as a result of working with animals.

#### 1.1 Physical Harm

Many animal species can cause physical injury to handlers. The types of injuries, which can vary considerably in severity, commonly include bites and scratches but the risk of kick and crush injuries should also be taken into account when working with larger animals. Since kick and crush injuries can be much more serious and in some cases fatal, it is particularly important to ensure safe working practices are rigorously implemented. Appropriate risk assessment of the

likelihood of injury from the particular species should be undertaken and, where necessary, additional training instituted.

Measures to prevent injury by animals include training in the correct method of handling animals, the use of gloves or other protective clothing, and various restraining devices or cages. The training requirements for license holders include procedures for handling and restraint and personal health and safety. If anyone has the least doubt about their ability to handle an animal, it is important to seek assistance from a colleague, or from animal unit staff.

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## 1.2 Needlestick and Sharps Injuries

A particular hazard associated with injecting animals is a needlestick injury since the animal may move at a critical point. Procedures such as careful positioning of hands and appropriate restraint of the animal should be used to minimise the risk of needlestick injury. Care should always be taken when using hypodermic needles to ensure the needle is capped until immediately before it is inserted into the animal. After use, needles should never be re-sheathed unless safe means have been introduced to do this (for example by holding the sheath or cap with tweezers so the needle cannot puncture the finger if it is not accurately positioned). After use, all sharps and hypodermic needles should be disposed of directly to a sharps container. Sharps and needles should not be put down and transferred later as this increases the risk of injury.

## 1.3 Repetitive Strain and Lifting Injuries

The lifting and handling of heavy items commonly used in animal facilities, such as bags of diet or bedding materials and metal cages, and the moving of large animals are areas where there is risk of injury. Basic advice on the lifting of heavy loads and manual handling is available on the Safety Office website

<http://www.hku.hk/safety/pdf/MHAL.pdf>.

More detail can be found in the Hong Kong Labour Department publication:- A Simple Guide to Health Risk Assessment: Office Environment Series OE 7/2005

[http://www.labour.gov.hk/eng/public/oh/MHO\\_eng.pdf](http://www.labour.gov.hk/eng/public/oh/MHO_eng.pdf).

The University Health Service website

<http://www.hku.hk/uhs/he/worker/manuallifting.htm>

also contains useful links and information such as risk assessment forms and the Labour Department Guide to Part VII of the

Occupational Safety and Health Regulation (Manual Handling Operations).

Some tasks undertaken in animal houses, such as removing tops from water bottles, may lead to repetitive strain type injuries. Procedures should be assessed to identify any areas where this may be a problem. Staff are advised to seek advice from the University Health Service at an early stage if they believe they may be experiencing any symptoms that may be attributed to repetitive type work.

## 2. Infection

Infection of the worker can arise by various means. It should also be noted that people can be vectors of infection to the LAU or other animal facilities and appropriate personal protective equipment (PPE) should always be worn. Policies for avoiding the spread of any agent being worked with to non target animals should also be developed by departments handling infectious agents. For example those working on avian influenza in the laboratory should not attend live markets, zoos or farms, or collect samples from wild waterfowl for a period of at least 48 hours after working with the virus.

### 2.1 Zoonotic infections

Animals may be infected with a range of micro-organisms or parasites that can also infect humans. These are known as zoonoses. Some well known examples of zoonosis include ringworm, bovine TB, leptospirosis (Weil's disease) and E.coli 0157. The zoonoses are diseases naturally spread from animals to man and are contracted via various routes including close contact during handling, via wound contamination or via contact with urine or faeces. Zoonotic disease may be mild or rapidly

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life-threatening and so should be recognised as a potentially serious risk. In some cases, such as LCMV infection and ovine chlamydiosis, there are additional risks to pregnant women/their foetus and contact with certain animals or materials from them should be avoided during pregnancy.

Useful guidance on the common zoonoses is given in an information leaflet published by the UK Health and Safety Executive (HSE) entitled Common zoonoses in agriculture. This is available on HSE's website at <http://www.hse.gov.uk/pubns/ais2.pdf>.

Fortunately, many laboratory animal species today are bred to be free of zoonoses that were once more common in these animals. All animals supplied by the LAU (primarily wild-type) have been bred to be specific pathogen free. A list of the agents screened for can be found on the LAU website at [http://www.hku.hk/launit/content/about/health\\_monitoring.pdf](http://www.hku.hk/launit/content/about/health_monitoring.pdf).

PIs and workers obtaining their animals, such as genetically modified mice, from commercial sources or collaborators should be aware of potential zoonosis and other infectious agents in these animals. Where a PI's establishes their own breeding colony screens for similar agents should be considered, particularly for the relevant zoonotic agents.

Despite this there remain zoonotic agents associated with laboratory animals, some which can be life-threatening. Field research with wild species also remains a source of exposure to zoonoses. Prevention of exposure to these animal-related illnesses requires knowledge of the zoonoses related to the animals with which you will be working. For example those obtaining samples from ducks or bat species need to take appropriate precautions to prevent

exposure to avian influenza and rabies respectively.

Appropriate advice should be given to animal handlers on the likely zoonoses of the species with which they work and the control measures necessary to prevent infection (for information on particular species please contact the Biological Safety Officer). It is important that workers can recognise the symptoms of any disease that may arise and inform their doctor they may be at risk in the event of any ill health. Further advice can be given by the University Health Service who will liaise with appropriate medical and veterinary experts as required.

Two of the rarer zoonoses of wild and captive rodents, including mice, are Hantaviruses and Lymphocytic Choriomeningitis (LCM) virus. They can both have serious sequelae and are consequently worth mentioning.

Hantavirus is transmitted through inhalation of dried rodent feces and urine when such material is raised into the air from disturbed bedding or nesting material. Transmission can also occur through rodent bites and contamination of broken skin or mucous membranes. The infection progresses from flu-like symptoms to respiratory complications and has resulted in death over 50% of the cases in the USA, particularly when medical care was not quickly obtained. You can prevent exposure through the use of PPE, good personal hygiene, and wet, properly ventilated handling of waste bedding material.

LCM is transmitted to humans by inhalation, broken skin or mucous membrane exposure to blood, urine, feces, and other body secretions from infected mice. The infection results in flu-like symptoms 1 to 3 weeks after exposure.

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More severe symptoms of meningitis and encephalitis can result. There is a special risk of exposure during pregnancy because the fetus can become infected. Because mice are well-screened and provided from virus-free sources, the potential for exposure in the university animal facilities is very limited. Again, use of proper PPE, such as disposable gloves and lab coat along with careful hand washing will further reduce the likelihood of exposure.

## 2.2 Experimentally-induced Infection

If animals are deliberately inoculated with micro-organisms, or material suspected of containing micro-organisms then housing and handling precautions should conform to the standards outlined in the University Biosafety Policy and specified in the BMBL set out by the containment of infected animals. The level of animal containment should correspond to the hazard group of the micro-organism being used as detailed in the BMBL Work on materials taken for analysis from deliberately infected animals and post-mortem examination must be conducted in laboratories of the appropriate containment level. Appropriate personal protective equipment including a lab coat or coverall, gloves and a face shield or visor should be worn when inoculating animals with infectious material. There is a requirement to notify the Safety Office of any infection or zoonoses contracted from animals in connection with a work activity. Departments should notify any cases of infection or zoonoses, using the University's accident, incident and occupational ill health reporting system, to the University Health and Safety Department who will then notify the labour department as appropriate.

## 3. Allergies

Laboratory Animal Allergy (LAL) is a well-recognised occupational disease that takes the form of a hypersensitivity, or allergic response that may develop as a result of contact with, or inhalation of, animal allergens. The university policy on LAL can be found on the Safety Office website at:-

<http://www.hku.hk/safety/pdf/ALA.pdf>.

The University Health Service (UHS) carries out pre-employment medical checks and annual medical surveillance on animal workers in the University. For details of the procedures involved and Occupational Health Program for Laboratory Animal Workers see the UHS website.

Surveys have shown that between 10 and 40% of people who work with laboratory animals such as rats and mice may experience allergic symptoms. In Hong Kong there is anecdotal information that suggests the incidence may be lower but it is still an important consideration when handling animals. The most common symptoms, similar to hay fever, are rhinitis (runny or stuffy nose) and conjunctivitis (watery or prickly eyes). Some people have urticaria (skin reactions similar to nettle rash or hives). Less commonly, about 10% may develop more serious symptoms of asthma. Occasionally, an individual may be allergic to an animal and following a bite, puncture wound or sting may go into anaphylactic shock. This is immediately life threatening and emergency medical treatment is required.

Departments where animals are handled should undertake a risk assessment to identify all potential sources of exposure, the routes of exposure, those people who are likely to be exposed, how long and how often they are

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exposed, and which parts of the body are exposed. This risk assessment must include the precautions needed to prevent or adequately control exposure. In many cases it will be necessary not only to implement safe systems of work but also to have appropriate ventilation systems; the use of personal protective equipment including respiratory protection may also be required. A local code of practice that address laboratory animal allergy and details the precautions necessary may help to control the risks involved. This local code should be consulted and followed by all who work with animals in the department.

Because of the infection and allergic hazards, it is important that the protective clothing and equipment worn when working with animals, e.g. aprons, coats, gowns, gloves, respirators etc., is limited in its use to the animal facilities, or to laboratories where animal work is conducted, and not worn elsewhere. Eating, drinking and smoking must be strictly prohibited when working with animals, and the importance of washing hands before and after handling animals is emphasised.

## 4. Other hazards

### 4.1 Chemicals

See <http://www.hku.hk/safety/pdf/CSL.pdf> for the University policy on the use of chemicals and the disposal of chemical waste. Users of chemicals should assess the risks associated with the handling of chemicals and reduce the risks by:

- (i) choosing the safest chemical which will perform the task;
- (ii) considering the hazardous properties of chemical and mixtures;

(iii) setting up waste disposal arrangements (including minimising waste generated); and

(iv) obtaining a review of procedures by the PI/supervisor, safety representative or Safety Office staff. References in the Safety Office library are available to help and guide users during the planning stage.

Users should be familiar with the basic chemical properties of the reagents they are using and be aware that it may include flammability, corrosiveness, reactivity, or the potential to be explosive. The more common potentially hazardous chemicals used in animal laboratories include solvents (alcohols, xylene, acetone, dimethyl sulfoxide), acids (hydrochloric, sulphuric), bases (sodium hydroxide, quaternary disinfectants), fixatives (formaldehyde, osmium tetroxide), sterilants (peracetic acid, chlorine dioxide, peroxides, gluteraldehyde), and anesthetics (isoflurane, tribromoethanol, methane sulfonate, nitrous oxide, urethane, barbiturates). Each chemical product should be handled carefully using any directions contained on the label, the recommended PPE, and in accordance with University guidelines and lab training. Further information is often given on the Materials Safety Data Sheet (MSDS) and these should be readily available for consultation when required.

### 4.2 Carcinogens

See <http://www.hku.hk/safety/pdf/Car.pdf> for the university policy on carcinogens. In brief, work with carcinogens can only be undertaken in the LAU suite especially designed for the purpose. A specific Code of Practice (COP) for handling the carcinogen of interest in the LAU suite must be developed by the PI before commencing work and it must detail the chemical to be used, its properties, how to inactivate it and the protective

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measures to be taken. This COP will also include all measures for dispensing the agent, its storage, transport and administration to the experimental animals as well as detailed procedures to be undertaken in the event of an accident. Consideration should also be given to potential shedding of the agent via animal waste and the measures required for achieving adequate protection.

### 4.3 Radioactive Materials

See <http://www.hku.hk/safety/pdf/RSafety.pdf> for the University Policy on the use of radioactive materials. Anyone wishing to carry out specific labeling experiments in animals is encouraged to contact the University Radiation Safety Officer, Dr John Leung via the Safety Office website. Under the Hong Kong Radiation Ordinance, Cap 303, the University is required to apply for licences in respect of the use of radioactive substances and irradiating apparatuses. The general provisions of the ordinance are

(i) to designate controlled radiation areas and limit access

(ii) designate approved workers

(iii) the granting of designated status is not automatic and it may be necessary for applicants to attend a short training course and/or take a test on radiation protection. When designation is granted, it normally relates to a specific project with an approved scheme of work to be carried out in named premises. Additional information is available from the Safety Office, Radiation Protection Unit, Room 402, James Hsioung Lee Science Building (tel. 2859 2547/2859 2546 or e-mail: [rpuso@hku.hk](mailto:rpuso@hku.hk)).

### 4.4 Drugs

It should be noted that the storage and use of certain drugs are subject to strict legal controls. Advice in this regard can be found on the LAU website. For clarification of any issues contact the director of the LAU. Animal Facility staff, laboratory workers and those in charge of experimental work, must recognise their joint responsibility to prevent accidents and ill health.

Anaesthetic agents used in operating theatres or for euthanasia should be used with caution and only under well ventilated conditions. Suitable scavenging systems must be employed to remove waste or expired anaesthetic gases at source, before they can enter the breathing zone of personnel working in the area.

### 4.5 Machinery Hazards, Slips Trips and Falls etc.

Common equipment in animal house areas includes cage washers, autoclaves, and cleaning apparatus, all of which may be hazardous if not used correctly. Some cage washers may present a noise hazard. Risk assessments should be undertaken by the department to identify any such hazards and appropriate control measures. If in doubt, further advice can be obtained from the Safety Office.

Accidents frequently occur from slipping on wet floors, and suitable non-slip footwear is an essential feature of work in an animal house facility. A particular hazard in animal houses arises from the need to wash or hose down areas which may contain electrical sockets or equipment, which must therefore be of waterproof design and construction.

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Staff must always use engineering control measures, or personal protective clothing and equipment, when handling chemical substances used to sterilise equipment, fumigate rooms or disinfect general areas. Staff preparing special diets or preparing solutions incorporating drugs,

radioactive substances, or toxic or carcinogenic chemicals, must always employ engineering controls, e.g. local exhaust ventilation, to remove the hazard at source, and wear suitable protective clothing and effective respiratory protection, where appropriate.

## Provision of Health and Safety Information to Animal Care Workers by Researchers

In order to ensure that animal care workers take appropriate precautions when coming into contact with animals deliberately infected with micro-organisms or with animals to which radioactive or other hazardous materials have been administered, researchers are required to provide information to the members of staff responsible for the day to day care of the animals. It is strongly recommended, before starting a programme of work involving the use of hazardous agents in animals that the PI should meet with the relevant supervisor or manager to discuss the risks associated with the work and the control measures that are required. One way of facilitating this exchange of information is for the PI/user to provide a copy of any relevant risk assessment to the appropriate supervisory member of staff who in turn is responsible for ensuring that the husbandry staff in the LAU or other unit where animals are handled are aware of the risks.

### 1. Accidents and Incidents

Accidents and incidents must be reported to and recorded by the person responsible for the work or the work area. Who this is, for example the researcher, the PI, the Chief Technician or manager, may vary depending on the particular circumstances and location of the accident or incident. A view should be taken locally, the

important thing is to ensure all accidents and incidents are reported and recorded. The University Safety Office and the UHS should be informed immediately in the event of any accident where exposure to a pathogen or infectious material may have occurred. A full accident record should be prepared and forwarded to the Health and Safety Department as soon as possible.

### 2. Waste

Rules covering the disposal of animal carcasses and other animal-related waste materials, including those contaminated with hazardous agents, must be detailed in local codes of practice, and must be strictly adhered to by all those responsible for disposal. Reference should be made to the University's Clinical Waste Code of Practice. Where required, further advice can be obtained from the Energy and Environmental Manager who is based in the Estates and Buildings Works Division.

### 3. Personal Safety and Security

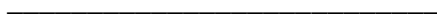
Security of animal houses is a matter of special concern in some countries where animal rights activists are operating. While Hong Kong has been relatively free from the undesirable elements associated with animal rights

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extremists those who work with experimental animals must be alert to this problem. Departments should assess the risks and introduce the necessary measures to ensure the security of staff and premises associated with animal work. Unauthorised persons should not be able to gain access to animal areas. All staff should be aware of the action to be taken in the event of intruders gaining entry to animal facilities or a bomb threat. Individuals who you

do not recognise in your laboratory areas particularly those close to animals and with no visible staff ID card should be challenged (It is easiest to ask if they need any help). Bear in mind that there are other reasons individuals may want access to laboratories e.g. drug or solvent abuse.



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