

**NATIONAL ADVISORY COMMITTEE FOR LABORATORY ANIMAL RESEARCH
THE TRAINING GUIDELINES**

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CHAPTER 1 : INTRODUCTION

1.1 Background

- 1.1.1 These Training Guidelines are to aid Institutions in implementing an educational and training programme (Training Programme) that will meet the expectations of the Guiding Principles of the National Advisory Committee For Laboratory Animal Research (NACLAR) .
- 1.1.2 In particular, these Training Guidelines are intended to assist institutional officials and Institutional Animal Care and Use Committees (IACUCs) or any others assigned the responsibility for coordinating Training Programmes (Training Coordinators) in determining the scope and depth of such programmes that will meet both institutional needs and the requirements of NACLAR.
- 1.1.3 It must be emphasised that a strong Training Programme on the use of laboratory animals goes beyond the involvement of scientists, research technicians and animal care personnel. To promote understanding of the scientific process and minimise misunderstandings, it is suggested that administrators, nonscientific members of the IACUCs, support staff, and other nonscientific personnel indirectly involved in activities using live animals be included in the programme.
- 1.1.4 The IACUC and Training Coordinators are responsible for developing clear objectives for each phase of the Training Programme. These objectives must meet both the Guiding Principles as well as institutional requirements. The methods for presenting material will depend on the audience, the objectives that have been set, the nature of the content, and the resources available.
- 1.1.5 It is recognised that people who provide day-to-day animal care require additional training that may extend beyond the scope and content proposed in these Training Guidelines. Reference is made to existing programmes offered by the American Association for Laboratory Animal Science (AALAS), Institute of Animal Technicians (IAT), American College of Laboratory Animal Medicine (ACLAM) and the Academy of Surgical Research.
- 1.1.6 Unless the contrary is stated, the meaning and definition of terms in the Training Guidelines shall be the same as those found in the Guiding Principles.

1.2 Scope of the Training Guidelines

- 1.2.1 These Training Guidelines encompass all staff caring for and working with live laboratory animals for scientific purposes. It is to ensure that these personnel are educated, trained and qualified to use animals in a manner that would be humane and ethical.
- 1.2.2 Training and education of all staff concerned must be mandatory, with oversight by the IACUC and financial assistance from the Institution.

1.2.3 The following categories of personnel must be involved:

- (a) Animal Facility Staff
 - (i) Animal Care-takers
 - (ii) Animal Technicians
 - (iii) Laboratory Animal Manager
 - (iv) Laboratory Animal Veterinarians

- (b) Research Staff
 - (i) Principal Investigators
 - (ii) Research Fellows
 - (iii) Post-doctoral and post-graduate students
 - (iv) Research Technicians

- (c) IACUC Members
- (d) Service Personnel
- (e) Teachers at Tertiary Institutions (Training for teachers at non-tertiary level can be determined by the Ministry of Education.)

1.2.4 The Training Guidelines are not intended to cover training in safety matters and handling biohazards. It does, however, recommend certain areas where staff dealing in such matters can be trained before undertaking procedures that may have bio-safety implications. The training on safety matters and the handling of biohazards should be fully dealt with by Institutions through Institutional Safety Officers or other designated personnel. .

CHAPTER 2 : ANIMAL FACILITY STAFF

2.1 Care-takers

2.1.1 In-house classes and on-the-job training conducted by senior management (e.g. experienced Technicians, Manager, Veterinarian).

2.1.2 Topics to be covered:

- (a) Guidelines, Laws and Ethical issues that impact on the care and use of research animals.
- (b) Recognising Pain and Distress
- (c) Responsibilities of Care-takers and other Animal Facility Staff members
- (d) Species-specific Husbandry and Care
- (e) Impact of the Environmental Factors on Research Animals
- (f) Personal Hygiene, Safety and Protection
- (g) Basic Handling of Biohazardous Materials
- (h) Handling Laboratory Equipment, and Facility Layout
- (i) Compliance with SOPs

2.2 Laboratory Animal Technicians

2.2.1 The Manager and/or Veterinarian and/or Director should instruct on the following:

- (a) National Laws and Guidelines
- (b) Institutional Policies for the care and use of laboratory animals
- (c) Institutional Health and Safety Program
- (d) Management of Biohazardous Materials
- (e) Local Cultural and Religious Views on Laboratory Animal Research

2.2.2 Laboratory Animal Technicians must enrol (on-line) to American Association for Laboratory Animal Science (AALAS) www.aalas.org for continuing education. 3 levels are available:

- (a) Assistant Laboratory Animal Technician (ALAT),

- (b) Laboratory Animal Technician (LAT), and
 - (c) Laboratory Animal Technologist (LATG).
- 2.2.3 Continued registration as members of the ALAT, LAT and LATG programmes are encouraged.
- 2.2.4 Technicians should be encouraged to attend other courses of interest, e.g. micro-manipulation of embryos, cryopreservation, micro-surgery, tissue preservation, exotic animals, etc.
- 2.2.5 All Laboratory Animal Technicians are to participate in the course on “Responsible Care and Use of Laboratory Animals” as described in Chapter 3.

2.3 Laboratory Animal Manager

- 2.3.1 Laboratory Animal Managers must be certified at least at Assistant Laboratory Animal Technician (ALAT) level or equivalent (Institute of Animal Technologists (IAT) Certificate level - see Institute of Animal Technologists www.iat.org.uk/).
- 2.3.2 The Laboratory Animal Manager should later be encouraged to enrol and obtain certification from Institute for Laboratory Animal Management (ILAM). ILAM is an AALAS educational programme developed to provide instructional management concepts that are applicable to the laboratory science industry and to enhance communication, team building, and networking among colleagues with mutual interests. The programme includes 64 classroom hours of instruction over a 2-year period. The following are class titles provided in past years:
- (a) Managing an AAALAC-site visit
 - (b) AALAS Orientation and Interactions
 - (c) Bioethics
 - (d) Facility Technology
 - (e) Leadership and managing diversity
 - (f) Stress management
 - (g) Institutional Policies and Public Relations
 - (h) Performance Appraisal
 - (i) Regulatory Compliance issues
 - (j) Financial Management

2.3.3 The Laboratory Animal Manager must participate in the course on “Responsible Care and Use of Laboratory Animals” as described in Chapter 3.

2.4 Laboratory Animal Veterinarian

2.4.1 The veterinarian must be registered with the AVA to practice in Singapore.

2.4.2 Laboratory Animal Veterinarians must participate in the course on “Responsible Care and Use of Laboratory Animals” as described in Chapter 3.

2.4.3 Veterinarians who specialise in laboratory animal medicine and science should be encouraged to attend and participate in relevant conferences, scientific meetings and workshops.

2.4.4 Obtaining higher degrees, recognition as specialists, and certification through American College of Laboratory Animal Medicine (ACLAM) would be particularly significant achievements.

2.4.5 Residency training will reinforce didactic study and provide an opportunity to acquire work experience. A good residency program will include the following major activities:

- (a) Animal Facilities Administration and Management
- (b) Clinical Medicine
- (c) Necropsy and Histopathology
- (d) Clinical Pathology
- (e) Experimental Surgery and Radiography
- (f) Research Training
- (g) Participation in Education and Training of Research Personnel and Students

CHAPTER 3 : RESEARCHERS

3.1 “Responsible Care and Use of Laboratory Animals”

- 3.1.1 Institutions must provide a course on basic animal experimentation requirements through its IACUC or otherwise. All researchers, i.e. Principal Investigators, Research Fellows, Post-doctoral and Post-graduate students, as well as Research Technicians, must first attend and pass this “Responsible Care and Use of Laboratory Animals” course.
- 3.1.2 Institutes should conduct their own course, or for the smaller institutes, send their staff and researchers to other institutes to attend this course. The course conducted at the National University of Singapore may be used as the benchmark for minimum standards required.
- 3.1.3 The “Responsible Care and Use of Laboratory Animals” course at each Institute must comply with NACLAR Guidelines on the care and use of animals.
- 3.1.4 The course should be conducted by senior staff of the animal research facility, e.g. the Director, Veterinarian or Manager, but not by researchers.
- 3.1.5 This course will comprise the following lecture topics:
 - (a) Biomedical research regulations, NACLAR guidelines and you
 - (b) The IACUC – Responsibilities, functions and proposal forms
 - (c) Animal models, research variables and the 3R’s
 - (d) Occupational health and safety in biomedical research
 - (e) Animal handling and blood collection
 - (f) Laboratory animal disease and diagnosis
 - (g) Basic laboratory animal anaesthesia and analgesia
 - (h) Introduction to surgery, post-operative care and euthanasia.
- 3.1.6 A hands-on exercise on the 4 basic laboratory animal species (mice, rats, guinea pigs and rabbits) should be provided:
 - (a) Identification, restraint and handling
 - (b) Routes of injection
 - (c) Blood sampling and gavage
 - (d) Euthanasia.

3.2 Responsibility for Level of Training

- 3.2.1 Principal Investigators are responsible for reporting to the IACUC (via animal protocol application) that they and their staff have sufficient qualifications and training in the procedures to be performed on animals. If not, IACUC will provide training for researchers in those particular areas.

3.3 Special Courses

- 3.3.1 It is acknowledged that “Advanced and Special” courses will need to be conducted depending on the complexity of the research programs. For example, special training on the use of large animals like pigs, dogs, sheep, goats and non-human primates may be required. Courses for exotic animals (handling, anaesthesia, sampling methods, husbandry practices) fish and / or birds may also be required. Special modules on wound management and suturing techniques may also be of special interest to researchers.
- 3.3.2 The IACUC, in conjunction with the animal facility staff, should be responsible for setting up these special courses as and when the need arises. Specialists may be consulted to conduct these special courses.

CHAPTER 4 : MEMBERS OF IACUC

4.1 ARENA IACUC 101

4.1.1 All members of the IACUC must be trained in their respective roles and responsibilities. The training must introduce members to the role of IUCAC and its evolution, provide basic information necessary for IACUC members to discharge their responsibilities and to provide a forum for response to, and discussion of, members' concerns and questions.

4.1.2 Recommended syllabus:

- (a) Criteria for membership to IACUC
- (b) Authority of the IACUC
- (c) Proposal (protocol) submission and review process
- (d) Monitoring of approved protocols and reviewing amendments
- (e) Record keeping
- (f) Semiannual reviews of animal care and use programs and institutional animal facilities
- (g) Handling animal welfare concerns
- (h) Roles and relationships between IACUC, CEO, AVA, Animal facility staff and animal care program, project sponsor and community.

4.1.3 One excellent source is the ARENA IACUC 101. This is a full day didactic and interactive training course for new as well as seasoned IACUC members, IACUC affiliates and individuals responsible for their Institution's animal care program. The sessions provide a basic yet comprehensive overview of the laws, regulations, and policies that govern the humane care and use of laboratory animals supplemented with examples and possible approaches for successful and effective administration. Current available resources to help IACUCs keep abreast of the latest information as well as take advantage of networking opportunities will also be covered.

4.2 Responsible Care and Use of Laboratory Animals

4.2.1 All members must participate in the course on "Responsible Care and Use of Laboratory Animals" as described in Chapter 3.

4.3 Continuing Education

4.3.1 All members should be encouraged to attend refresher courses to keep abreast with latest updated and reviews on the responsibilities of IACUC.

CHAPTER 5 : SERVICE PERSONNEL

- 5.1 A general information sheet on the nature of facility that the service personnel are entering into, and any other safety aspects should be provided.
- 5.2 Service personnel should be briefed, especially if there is a need to enter into rooms where large animals (e.g. non-human primates, dogs) and/or any rooms where biohazards are used.
- 5.3 Service personnel entering an animal facility to service equipment should be accompanied by an animal care staff (caretaker or Technician) to ensure that welfare of animals are not compromised.

CHAPTER 6 : TEACHERS

6.1 Tertiary Level

The person-in-charge of the class must attend and pass the course on “Responsible Care and Use of Laboratory Animals” as described in Chapter 3.

6.2 Non-tertiary Level

The Ministry of Education to decide on the level of training required.

CHAPTER 7 : HANDLING BIOHAZARDS

- 7.1** The Training Guidelines are not intended to cover training in handling biohazards, but it is recommended that the training be provided to any staff or researchers prior to commencement of any biohazard-related work involving :
- (a) Genetically Modified Organisms (recombinant genetic material)
 - (b) Radiation (x-ray, isotopes etc)
 - (c) Chemicals (mutagens, carcinogens)
 - (d) General hazards – fire, short-circuit
- 7.2** Institutional Offices of Safety and National bodies such as GMAC (for health and environmental effects of GMOs), Health and Sciences Authority (HSA), the Bio-safety Committee of Ministry of Health and the Safety Office(s) at Ministry of Manpower should be consulted for advice when necessary.