

HKSTP IACUC

13 – Animal Research Facility Guidelines

Version History

Version	Effective Date
1	16/06/2023

1. Purpose

The purpose of the guidelines is to provide a reference to the minimum standard of the quality of animal facilities for research purposes to ensure and uphold animal welfare. Please note that animal facilities for specific species may differ according to the species' innate behavior and physical needs.

2. General Policies

2.1 All animal research and holding facilities within the premises of HKSTP must be approved by HKSTP Facility Management. For any matters in relation to building of animal research/ holding facilities, please consult HKSTP Facility Management for guidance.

2.2 Only locations with animal holding facilities approved by HKSTP Facility Management can hold animals for more than 12 hours at the approved location within the premises of HKSTP.

2.3 Facility conditions and environmental parameters for laboratory animal breeding and animal holding use shall meet the standards for environment and housing facilities for laboratory animals. All animal facilities shall have obtained an administrative animal-related permit.

2.4 When designing and planning on animal housing and environment, the following factors shall be considered.

- i. The species, strain, and breed of the animal and individual characteristics, such as sex, age, size, behavior, experiences, and health.
- ii. The ability of the animals to form social groups with conspecifics through sight, smell, and possibly contact, whether the animals are maintained singly or in groups.
- iii. The design and construction of housing.
- iv. The availability or suitability of enrichments.
- v. The project goals and experimental design (e.g., production, breeding, research, testing, and teaching).
- vi. The intensity of animal manipulation and invasiveness of the procedures conducted.
- vii. The presence of hazardous or disease-causing materials.

- viii. The duration of the holding period.
- 2.5 Animals of different species shall not be housed within the same area unless scientifically justified and approved by HKSTP IACUC. The immunocompetence of the animal shall be assessed when housed with other animals.
- 2.6 The quality of laboratory animal housing equipment and bedding shall comply with standards for environment and housing facilities for laboratory animals and laboratory animal welfare standards. It shall be ensured that the facilities and equipment do not cause accidental injury or harm to animals.
- 2.7 Housing equipment shall be cleaned and disinfected regularly; bedding shall be sterilized, have minimal dust, and be replaced regularly, as well as kept clean and comfortable; drinking and feeding systems for animals shall be safe, reliable and easy to use, as well as kept clean, sanitized, and in good working condition.
- 2.8 Minimum floor-area (space) and height of cages housing any species of animals shall comply with relevant laboratory animal standards. Space shall be allocated appropriate to the husbandry requirements and physiological and behavioral needs of the animals. It shall be ensured that each animal caged is able to freely express most natural behaviors, including turning around, standing upright, stretching limbs, lying down, walking, grooming, nesting etc.
- 2.9 Animal housing shall be done at the appropriate animal biosafety level. In general, animals inoculated with agents that are infectious to humans or to other animals shall be housed at ABSL2. Animals administered viral vectors or rDNA may be housed at ABSL1+ or ABSL2, depending on risk assessment.
- 2.10 Housing of animals of different species with the same cage is prohibited unless scientifically justified and approved by HKSTP IACUC.
- 2.11 Appropriate facilities and working environment are required, the requirements shall depend on the biological safety level required by the Project.
- Animal Biosafety Level 1 (ABSL1) is suitable for work involving well characterized agents that are not known to cause disease in immunocompetent adult humans, and present minimal potential hazard to personnel and the environment. ABSL-1 facilities should be separated from the general traffic patterns of the building and restricted as appropriate. Special containment equipment or facility design may be required as determined by appropriate risk assessment.
 - Animal Biosafety Level 2 (ABSL2) is suitable for work involving laboratory animals infected with agents associated with human disease and pose moderate hazards to personnel and the environment. It also addresses hazards from ingestion as well as from percutaneous and mucous membrane exposure.
 - ABSL2 laboratory shall fulfill the following criteria;
 - Access to the animal facility is restricted;
 - Personnel must have specific training in animal facility procedures, the handling of infected animals and the manipulation of pathogenic agents;

- Personnel must be supervised by individuals with adequate knowledge of potential hazards, microbiological agents, animal manipulations and husbandry procedures; and
- Procedures involving the manipulation of infectious materials, or where aerosols or splashes may be created, should be conducted in BSCs or by use of other physical containment equipment. Appropriate personal protective equipment must be utilized to reduce exposure to infectious agents, animals, and contaminated equipment. Implementation of employee occupational health programs should be considered.

3. Guidelines on Cage Density to Prevent Overcrowding

- 3.1 The space required per animal is complex and consideration shall include but not limited to animal's body weight/ surface area, age, sex, characteristics of animal species, number of animals cohoused, duration, intension of use and any special needs they may have.
- 3.2 Socially housed animals shall be given sufficient space and structural complexity to allow them to escape aggression or hide from other animals in the pair or group. Breeding animals will require more space, particularly if neonatal animals will be raised together with their mother or as a breeding group until weaning age.
- 3.3 There is no single formula for calculating an animal's space needs based only on body size or weight such space allocations shall be assessed, reviewed, and modified case-by-case. At a minimum, animals must be provided with enough space to express their natural postures, make postural adjustments (ie, be able to turn around) without touching the enclosure walls or ceiling and comfortably rest away from areas soiled by urine and feces.
- 3.4 Recommended minimum spatial requirements for commonly used laboratory animals are listed in Table 1. The animals' growth characteristics, sex, age, behavior, etc. shall be taken into consideration when arranging for animal housing environment. For species not specifically indicated, advice should be sought from the scientific literature and from species-relevant experts.

Table 1: Recommended spatial requirements for commonly used laboratory animals

Animals	Weight [g]	Floor Area/ Animal* [cm ²]	Height** [cm]
Mice in groups	≤ 10	38.7	12.7
	≤ 15	51.6	12.7
	≤ 25	77.4	12.7
	> 25	≥ 96.7	12.7
Female mice with litter***		330	12.7
Rats in groups	≤ 100	109.6	17.8
	≤ 200	148.3	17.8
	≤ 300	187	17.8
	≤ 400	258	17.8
	≤ 500	387	17.8
	> 500	≥ 451.5	17.8
Female rat with litter***		800	17.8
Hamsters	≤ 60	64.5	15.2

	≤ 80	83.8	15.2
	≤ 100	103.2	15.2
	> 100	≥ 122.5	15.2
Guinea pigs	≤ 350	387	17.8
	> 350	≥ 651.5	17.8

* Floor space taken up by food bowls, water containers, litter boxes, enrichment devices, etc. shall not count towards floor space.

** From cage floor to cage top.

** Some types of breeding configurations, depending on the number of adults and litters, and size and age of litters, may require more space. Sufficient space should be allocated for mothers with litters to allow the pups to develop to weaning without detrimental effects for the mother or the litter.

4. Guidelines for Procedures Related to Radioactive Substances

4.1 All procedures related to radioactive substances must be performed in a licensed radiation laboratory.

4.2 A valid operator license must be provided to HKSTP IACUC for record if the Projects involves the use of any irradiating apparatus.

4.3 The record for procurement of any controlled drugs and/or radioactive substances shall be kept and recorded properly.

4.4 Radioactive substances-treated animal including their excretions and carcasses are considered as radioactive.

References

National Research Council (US) Committee for the Update of the Guide for the Care and Use of Laboratory Animals. Guide for the Care and Use of Laboratory Animals. 8th edition. Washington (DC): National Academies Press (US); 2011. 3, Environment, Housing, and Management. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK54046/>

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