***STANDARD OPERATING PROCEDURE – B001***

**Working with animals and animal tissues**

1. **Objectives**

The objective of this document is to establish standard operating procedures for working with animals and animal tissues, ensuring the safety of laboratory personnel by mitigating potential risks associated with hazardous materials, and injuries. In addition, this SOP aims to enhance the efficiency of experimental workflows.

1. **Personal Protective Equipment**

To ensure safety during working with animals, appropriate personal protective equipment (PPE) must be worn. This includes:

* Long pants and closed-toe shoes to protect against spills.
* A long-sleeved, buttoned lab coat to minimize skin exposure.
* Disposable nitrile gloves to prevent contact with biological materials.
* A face mask to reduce inhalation risks and reduce the likelihood of breathing in bioaerosol.
* Safety goggles or a face shield when there is a risk of splashes or aerosols.
* If the user has long hair, it should be tied back.
1. **Potential Hazards**

Working with animals and animal tissues presents various hazards that must be managed to maintain a safe working environment. These include:

* **Infection Risk:** Direct contact with infected animals or their tissues, as well as accidental exposure to contaminated fluids like blood, urine, or saliva, can lead to infection.
* **Physical Injury:** Animal bites or scratches can cause wounds that may become infected. Injuries from sharp instruments, such as needles or scalpels, can occur during procedures (e.g., recapping needles, use of scalpel blade without a handle).
* **Allergic Reactions and Asthma:** Sensitivities to animal dander, excretions, or bedding materials can trigger allergic reactions or exacerbate asthma in susceptible individuals.
* **Environmental Hazards:** Escape of infected or genetically modified organisms (GMOs) can lead to the release of pathogens or GMOs into the environment.
* **Chemical Hazards:** Exposure to hazardous chemicals, such as bleach (sodium hypochlorite), formalin and paraformaldehyde which are commonly used for disinfection and tissue preservation, can cause skin irritation, respiratory issues, or long-term health effects. Moreover, exposure to tamoxifen, azoxymethane and streptozotocin poses significant risks and is critical to consider in cancer research.
1. **Procedures**

1. Preparation:

* Ensure the appropriate licenses and applications have been applied for and granted prior to conducting animal experiments.
* Ensure that all personnel have received training and related safety protocols. Undergo medical surveillance and register as a biohazard worker and animal handler prior to the start of work.
	+ MC06 Biological Safety
	+ MC03 Chemical Safety II / Hazardous Waste Management
	+ MC07 Chemical Safety I / Chemical Safety for Laboratory Users
* Conduct all activities in a **Biosafety Level 2 (BSL-2) laboratory and** utilize a **Class II Biosafety Cabinet** (BSC) when infecting animals with pathogens.
* The use of anesthesia should be minimized for workers that are pregnant or may be pregnant.
* If any prescription drugs and / or drugs of addiction are to be used during an anesthetic procedure, ensure the drugs are normally locked away in a safe place.
	+ **Note**: The following information should be recorded each time the drug is taken for use: user’s name and signature, amount used, and balance of the drug after use.
* Wash hands thoroughly before and after handling animals or their tissue samples.
* Clean surfaces with **70% ethanol (v/v)** and arrange all necessary equipment to ensure a safe and efficient workflow (e.g. absorbent bench liners, surgical instruments, liquid nitrogen).
* Clearly label all containers and / or tubes intended for storage of tissues and other biological materials.

2. Animal Handling:

* Calmly and quietly approach animals to minimize stress.
* Use appropriate methods to restrain animals, ensuring their safety and comfort.
* Prior to injecting or exposing animals with pathogens, chemicals, or drugs, calculate appropriate doses and handle all animals as humanely as possible.
* After exposing animals to pathogens, chemicals, or drugs, continuously observe the animal for any signs of distress or adverse reactions.
	+ **Note:** Infected animals should be kept in individually ventilated cages (IVC) in the Laboratory Animal Facility with adequate food and water provided.

3. Working with animal tissues:

* Follow ethical guidelines for tissue collection, employing sterile instruments and techniques to minimize contamination.
* When sacrificing animals please select an appropriate procedure (i.e. CO2 chamber, neck dislocation). Ensure all animals are euthanized prior to tissue collection and further surgical procedures.
* Store collected tissues under suitable conditions (e.g. refrigeration at 4°C or freezing at - 20°C / - 80°C) to maintain their viability.
* Dispose of animal tissues in accordance with institutional policies, deliver animal tissues to the Laboratory Animal Facility for further treatment.
	+ **Note**: If the animal tissue is **infectious**, process it in a **BSC** until it is rendered inactive by treating with appropriate reagents (i.e. 10% formalin, 4% paraformaldehyde).

4. Transport:

* Ensure that animal cages are placed in a secure secondary container (with ventilation) to prevent accidental releases during transportation.
* All secondary containers should be labeled with contact details for individuals to notify in case of release (e.g. supervisor, lab manager, etc).

5. Cleanup and Disposal:

* Deliver the treated animal tissues to the Laboratory Animal Facility for further treatment.
* For small amounts of tissue waste **not involving chemicals**: Treat with 1% sodium hypochlorite (bleach) overnight or autoclave the tissues. Place the tissues in a **red plastic biohazard bag** for disposal.
* For small amounts of tissue waste **involving chemicals**: Treat with 1% sodium hypochlorite (bleach) overnight. Place the tissues in a **Solid with Toxic Chemicals waste container** for disposal.
	+ **Note**: leftover animal tissues should be discarded as hazardous biohazard waste.
* Dispose sharps (e.g. single-use scalpels) in designated sharp boxes and discard the absorbent bench liners as biohazard waste and clean the work area thoroughly with 70% ethanol.
* Autoclave the biohazard waste which does not contain chemicals and radiation substances before disposal.
* When working with infectious animals in the BSC, ensure the BSC is decontaminated with appropriate disinfectant after use. Carefully remove and dispose of PPE and follow through handwashing.

6. Emergency Procedures:

* In the event of an animal bite or scratch, wash the wound immediately with soap and water, and seek medical attention.
1. **Incident Reporting**
* Report any accidents resulting in injuries and animal escapes to the Principal Investigator and/or the departmental safety officer (DSO) immediately.
* For serious incidents, notify the Security Unit immediately by calling the 24-hour hotline on **23588999**.
1. **References**
* Hofer, M. (2016). *SOP\_SMB\_002: Working with animals and animal tissues.* Risk Assessment. The University of Sydney.
* Lim, S., & Coleman, N. (2014). *SOP SMB002.2 (SLL NC 0614): Working with animals and animal tissues*. Standard Operating Procedure. The University of Sydney.
* Safety Posters - Hazardous Waste Management | Health, Safety and Environment Office - The Hong Kong University of Science and Technology. (2025). Hkust.edu.hk. https://hseo.hkust.edu.hk/Safety%20Posters%20-%20Hazardous%20Waste%20Management