

	<h1><u>ULAM</u></h1> <p>Unit for Laboratory Animal Medicine</p>	<p>Standard Operating Procedure</p>
<p>Title: ULAM Animal Containment Policies and Procedures</p>		
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PURPOSE: Select areas of research involve the administration or exposure of animals to hazardous substances that, if not appropriately contained, may negatively affect the health of animal care personnel and/or other animals. This document outlines procedures to be utilized by personnel within the Unit for Laboratory Animal Medicine (ULAM) as well as investigators, technicians, and laboratory staff when working with animals exposed to hazardous substances. The document also addresses portions of the animal use application process directly related to hazardous substance use. Procedures related to the care and handling of animals exposed to radioactive materials are detailed in a separate document, *“Standard Procedures and Protocols for Using Radioactive Material in Animals”* maintained by Radiation Safety Services (RSS).

A. RESPONSIBILITIES:

1. It is the responsibility of all individuals working within the containment rooms, including ULAM personnel, as well as Principle Investigators and their staff to help ensure that individuals both within and outside of the facilities are not exposed to unacceptable levels of hazardous substances.
2. It is ULAM’s responsibility that all ULAM personnel working in containment rooms be familiar with and follow the procedures outlined in this SOP.
3. It is the PI’s responsibility to identify, at the time of the UCUCA protocol review, all potential hazardous substances proposed for use. The PI must also be familiar with the potential dangers associated with the use of each substance and propose the appropriate methods to minimize or eliminate them.
4. It is the PI’s responsibility that all laboratory staff be aware of the specific portions of animal use protocols that require animals be housed in containment housing. This information must be conveyed to the appropriate ULAM husbandry supervisor (see Section C: Relevant Personnel Contact Information, below).
5. It is the PI’s responsibility that all laboratory staff working in the containment rooms be familiar with and follow the procedures outlined in this SOP unless otherwise approved.’
6. It is the PI’s responsibility that all new laboratory personnel working in the containment rooms attend the mandatory class entitled “ULAM Hazard Containment.” Schedules and registration for the course can be found on the UCUCA website (www.ucuca.umich.edu).

B. RELEVANT PERSONNEL CONTACT INFORMATION:

1. ULAM Containment Coordinator – 615-7179
2. ULAM Supervisors for each containment area
 - a) Animal Research Facility (ARF) – 936-6163
 - b) Medical Sciences Research Building (MSRB) – 615-7079
 - c) Kresge Complex – 764-4148
 - d) Cancer Center and Geriatric Center (CCGC) – 936-3946
 - e) Life Sciences Institute (LSI) – 763-1342
 - f) Biomedical Sciences and Research Building (BSRB) – 764-4148
3. Occupational Safety and Environmental Health – 763-6973
4. Institutional Biosafety Committee (IBC) Coordinator – 936-3934
5. Radiation Safety Services (RSS) – 764-4420
6. ULAM Veterinary Technician Office – 936-1037
7. ULAM Front Desk – 764-0277

C. DEFINITIONS and ABBREVIATIONS:

1. **Animal Biosafety Levels 1, 2, 3, 4 (ABSL- 1, ABSL-2, etc):** Four biosafety levels are described in the Center for Disease Control document, "Biosafety in Microbiological and Biomedical Laboratories" also know as the BMBL (www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm). The biosafety levels are described for activities involving infectious disease work with experimental animals. Each level is defined by a combination of practices, safety equipment, and facilities that provide protection to personnel and the environment. The level of protection increases from ABSL-1 to ABSL-4. Research projects requiring ABSL-3 or ABSL-4 containment are not currently permitted at the University of Michigan.
 - a) **ABSL –1:** Animal Biosafety Level 1 is suitable for work involving well characterized agents that are not known to cause disease in healthy adult humans and that are of minimal potential hazard to laboratory personnel and the environment. The level of containment necessary for ABSL-1 projects involving rodents has been judged to not be significantly different from the standard precautions used in U of M specific pathogen free (SPF) rooms. Therefore, after consultation with the U of M Office of Safety and Environmental Health (OSEH), it was determined that ABSL-1 rodent studies can be conducted in standard SPF housing rooms with no additional precautions, procedures, or signage.
 - b) **ABSL-2:** Animal Biosafety Level 2 involves practices for work with those agents associated with human disease. It addresses hazards from ingestion as well as from percutaneous (through the skin) and mucous membrane (ex eyes, nose, mouth) exposure. ABSL-2 is not sufficient to protect against agents that are readily transmitted via aerosol. ABSL-2 procedures may not protect rodents from rodent-specific infectious agents readily transmitted via aerosols. Therefore, animals experimentally or naturally infected with rodent diseases will not be permitted into ABSL-2 containment areas without specific approval by the ULAM Containment Coordinator.
2. **Personal Protective Equipment (PPE):** Personal protective equipment provides a physical barrier to hazardous substances that might otherwise come into contact with an individual's skin, eyes, mucous membranes, and clothing. The equipment should protect the part of the body that is reasonably expected to come into contact with hazardous substances. Examples of PPE include, but are not limited to gloves, masks/respirators, goggles, gowns, shoe covers, and hair bonnets.
3. **HEPA filter:** High Efficiency Particulate Air filters remove 99.97% of all particles greater than 0.3 um in size.
4. **Biological Safety Cabinet (BSC):** A biological safety cabinet is used to provide containment of splashes or aerosols that may be generated while working with hazardous substances or animals exposed to such substances. Three kinds of biological safety cabinets, designated as Class I, II and III have been developed to meet various research and clinical needs. Biological safety cabinets use high efficiency particulate air (HEPA) filters in their exhaust and/or supply systems. Biological safety cabinets differ substantially from laminar flow hoods commonly used in SPF animal housing rooms at the U of M. Laminar flow hoods direct air towards the operator and should never be used for handling infectious, toxic or sensitizing materials. All animal procedures within a containment room must be conducted within a BSC unless otherwise approved.
5. **Occupational Safety and Environmental Health (OSEH)**

6. **Institutional Biosafety Committee (IBC):** The University of Michigan committee that oversees and approves recombinant DNA research conducted in association with the University.
7. **Animal housing cubicle:** A small, prefabricated, self-contained animal housing room.

D. EQUIPMENT:

1. Personal Protective Equipment (PPE):

- a) The specific PPE required within a containment room is based upon the procedures and hazards in use and is posted on the Containment Room Sign. This sign should be consulted each time prior to entering a containment room.
- b) PPE should be worn at all times within a containment room.
- c) PPE supplies may be kept inside the animal room unless the nature of the hazard necessitates putting on PPE before entry. Unless otherwise indicated, protective clothing should be donned immediately upon entering and removed immediately before leaving a containment room or cubicle. Discard disposable items in the trash container within the containment room/cubicle.
- d) Personal protective equipment to be worn in all containment areas unless otherwise approved includes:
 - Disposable gown (typically plastic)
 - Surgical mask
 - Shoe covers
 - Hair bonnet
 - Gloves (latex unless otherwise indicated)
 - Protective safety glasses or goggles. Prescription glasses are not themselves protective and cannot be used in place of safety glasses.
- e) Respirators
 - Respirators are used to protect individuals from exposure to hazardous substances. Their use is based on a risk assessment performed by OSEH and will be determined on a case-by-case basis. NOTE: a surgical mask is not considered a respirator requiring participation in the OSEH Respiratory Protection Program. However, workers who are required to wear respirators must participate in the Program and receive medical clearance and surveillance, respirator fit testing, and respirator use training. OSEH (615-2140) can provide information on obtaining respirators.
 - Areas or operations that require the mandatory use of a respirator will be posted.
- f) Individuals should wash their hands either immediately before (if the sink is located adjacent to the hallway door) or immediately after leaving a containment room.
 - If a sink is not available for use, hands must be cleaned with a hand sanitizer (waterless soap). Hand washing with soap and water is then required as soon as practical after leaving the area.

2. Biological Safety Cabinet (BSC)

- a) BSCs within the containment rooms are NOT fume hoods. Therefore, volatile chemicals should not be used within the hoods. Contact OSEH for guidance if work involving volatile chemicals will be conducted.
- b) Annual certification of all BSCs are performed by OSEH. The date of the most recent inspection is indicated on a sticker placed on the cabinet by OSEH.
- c) Periodic cleaning: Pre-filters in the BSC should be swept weekly and changed as needed by ULAM personnel. If possible, the filters should be lightly misted with a 1:32 bleach solution prior to sweeping so that there is less aerosolization of materials while sweeping. Filters should not be vacuumed unless a specially designed HEPA filtered vacuum is used.
- d) HEPA filters within the BSC must not be wetted or swept at any time. Filters will be serviced or removed only by OSEH.

E. ANIMAL CONTAINMENT ROOMS – access, design, location, and identification

1. Access to the animal room is limited to personnel who have been advised of the potential hazard and who need to enter the room for program or service purposes when work is in progress. In general, persons who may be at increased risk of being susceptible to an agent or for whom exposure might be unusually hazardous are not allowed in the animal room. These individuals are identified through a process of self-reporting as outlined on the OSEH website (<http://www.oseh.umich.edu/occmcd.html>).
2. All animals will be housed in designated containment rooms that meet the following specifications.
 - a) The room must be designed and constructed to facilitate cleaning and housekeeping.
 - b) Either a handwashing sink must be available in the room or a waterless hand disinfectant (waterless soap) dispenser must be located in the room.
 - c) Doors to animal rooms must be self-closing and kept closed when animals are present.
 - d) All containment rooms and cubicles must be negatively pressurized with respect to the hallway. This will be assessed daily by ULAM husbandry personnel and noted on the room sheet. Exhaust air must be discharged directly outside of the building without being recirculated to other rooms. ARF 3520 is equipped with an alarm that will activate if a ventilation failure occurs.
 - e) If floor drains are present, the drain traps must always be filled with water or a suitable disinfectant or sealed with removable trap seals. Consult OSEH for suitable disinfectants.
 - f) For rooms housing animals infected with infectious agents, an autoclave which can be used for decontaminating infectious waste must be available in the vicinity.
3. Containment housing rooms are located in the following areas:
 - a) Animal Research Facility (ARF)
 - b) Medical Sciences Research Building (MSRB) – can accommodate immunocompromised animals (i.e. nudes and SCIDs)
 - c) Kresge
 - d) Cancer Center and Geriatric Center (CCGC)
 - e) Life Sciences Institute (LSI)
4. Completion and Posting of the Containment Room Sign

- a) The ULAM Husbandry Supervisor will complete the Containment Room Sign. The information needed to complete this sign is collected by the Supervisor and recorded on a Hazardous Material Information Sheet (HMIS) (Appendix I). Information that must be listed on the HMIS includes:
 - Name of the hazardous substance(s)
 - Appropriate ABSL and necessary PPE
 - Type of agent (ie. infectious, chemical, or radioactive)
 - Name and telephone number of the responsible ULAM Supervisor
 - Name and telephone number of the PI or his/her designate
 - Special instructions related to the protocol (found in Sirius – see Section G.1.b below). Special instructions could include the use of additional or specialized PPE, special caging, etc.
 - Appropriate method of dirty bedding disposal, cage decontamination (if needed), and carcass disposal
 - b) The ULAM room technician will remove the Containment Room Sign and project-related information when the experiment is terminated. These will be kept in the housing room (such as in a binder or on a clipboard) until the Area Supervisor determines that it is unlikely that it will be used again in the near future or until the expiration of the protocol.
5. Containment rooms will be maintained as specific pathogen free (SPF) animal housing rooms as is standard within ULAM. Although animals are infected with a hazardous substance, they must still be free of incidental infectious or parasitic agents of rodents (this includes but is not exclusive of MPV, MHV, KRV, and pinworms). The instituted containment practices are sufficient for approved hazardous substances, but may not be sufficient to contain select rodent infectious agents. Non-SPF (“conventional”) animals that must be housed in a containment facility must not be housed with SPF animals without the expressed authorization of the ULAM Containment Coordinator.

F. PROCESS FOR ULAM PERSONNEL TO ACCESS APPROVED CONTAINMENT PROCEDURES:

1. Protocols reviewed between January 1, 2004 and September 14, 2005:
 - a) During protocol review, the ULAM Containment Coordinator will indicate any appropriate precautions and the indicated containment level in the Special Notes Section of the Protocol Profile Report in Sirius.
 - All protocols with a hazardous substance listed in the Protocol Profile Report and reviewed after January 2004 will have some notation in the Special Notes Section indicating how the animals and their cages should be handled. If no special procedures or containment practices are necessary, this will be noted as well.
 - If no notes are indicated, the ULAM Containment Coordinator should be contacted by the husbandry supervisor to ensure that an oversight has not been made.
 - The Supervisor should contact the ULAM Containment Coordinator if the procedures and equipment requested by the PI differs from what is indicated in the Special Notes Section.
 - b) Accessing the Special Notes Section within Sirius:
 - To find agents specific to a protocol
 - (i) Select “Activities” menu, choose “Protocol”, and then choose “Update Protocol Information.” Protocol Screen is now open

- (ii) From row of buttons on bottom, choose "Find". Type in desired 4-digit protocol number, click "OK"
 - (iii) Highlight species from scroll list [Humane Use Category (HUC) does not matter, only species]
 - (iv) Click "Hazardous Agents" Button. Double click agent or highlight agent and click "info" button for ABSL information
 - To find general information about a hazardous substance:
 - (i) Pull "Lists" menu down, choose "Protocol Lists", and choose "Hazardous Agents"
 - (ii) Find agent and highlight. Will give ABSL (default) and category (carcinogenic, chemical, infectious, radioactive, teratogenic, or toxic). NOTE: the ABSL to be used for a protocol is based on a risk assessment for that protocol. Therefore, it should never be assumed that the default biosafety level is appropriate for an agent within a protocol.
2. Protocols reviewed on or after September 15, 2005:
- a) A representative from OSEH will review and indicate any appropriate precautions and the necessary containment level in the Notes/Comments field of the Protocol Title section of eSirius.
 - If no notes are indicated, the OSEH representative should be contacted by the husbandry supervisor to ensure that an oversight has not been made.
 - All ULAM husbandry supervisors will have access to view the Notes/Comments field.

G. STANDARD HUSBANDRY PRACTICES

1. General Considerations
- a) Unless otherwise directed in this document, animal care procedures should be performed as per ULAM standard procedures.
 - b) Each containment cubicle should be considered as though it were a separate room. Therefore, all procedures that pertain to moving between rooms should also be instituted when entering multiple cubicles during a single time period.
 - c) PPE should be completely changed between each containment cubicle or room and between animals belonging to different PIs.
 - d) Animal cages may only be opened within the biological safety cabinet.
 - e) Even within the biological safety cabinet, two cages containing animals must never be opened at the same time as this may allow the introduction of a hazardous substance between boxes. All procedures should be carefully performed to minimize the creation of aerosols.
 - f) When a biocontainment cost center is not being used (ex. chicken containment), technicians should recharge the PI for all technician time and extra supplies used according to instructions from the Area Supervisor.
2. Appropriate Animal Caging and Bedding
- a) Animals must be housed in cages according to current cage size and population density recommendations. Rodents should be housed in microisolator cages or in the Biozone caging system located in 3520 ARF. If indicated by the nature of the hazard, disposable cages can be used. Housing for other species are detailed in the following ULAM documents:
 - Spray Down Pens for Biohazard Pigs

- Ferret SOP
 - 2431 Annex Room Sheet
 - B590 MSRB Room Sheet
 - 3508 ARF Biohazard Room Sheet
 - 3516 ARF Biohazard Room Sheet
 - 3520 ARF Biohazard Room Sheet
 - 6506 KI Biohazard Room Sheet
- b) Animal cage hazard identification
- All cages within a containment room will be labeled with a yellow acetate.
 - The laboratory must place a colored, pre-printed sticker (or other ULAM approved notation) on the acetate indicating if the hazardous substance is an infectious or chemical agent as well as the date the animal was exposed to the agent. ULAM husbandry supervisors can identify the source of the stickers for the laboratory staff's use at the time that the Containment Room Request is made. The presence of these stickers will indicate to the ULAM personnel the appropriate way to decontaminate the caging and dispose of any waste present.
- c) Animals administered toxic chemicals or toxins
- Rodents must be housed in solid-bottom cages. Wire bottom cages must not be used.
 - Non-rodents should be housed in cages suspended over pans filled with bedding (not pens or runs).
3. Provision of Food and/or Water Containing Hazardous Substance(s)
- a) Unless otherwise specified, food and water should be provided according to established ULAM protocols.
- b) Special procedures for handling, labeling, and disposing of food or water containing a chemical agent should be noted on the Containment Room Sign and Hazardous Material Information Sheet (completed by the Area Supervisor). For example, if the chemical is provided in the water, each bottle must be labeled with the name of the agent and its concentration. Labels are available through the University's Office of Occupational Safety and Environmental Health (OSEH).
- c) It is permissible to reuse the water bottles containing a hazardous substance to reduce the number of contaminated pieces of equipment to be washed. If reused, bottles should be returned to the cages from which they came. Water bottles should be washed no less frequently than every 2 weeks.
4. Special procedures necessary for water supplemented with Bromodeoxyuridine (BrdU)
- a) Assuming no other hazardous substances are administered, animals given BrdU in their drinking water can be housed in a traditional SPF (non-containment) rodent housing room. However, since exposure to large quantities of BrdU may present a human health hazard, special procedures are required for its disposal and for cages whose bedding is wet with BrdU supplemented water.
- b) All water to be disposed of which remains within a bottle (such as at the time of cage change) must be collected in a carboy or other water-tight, sealable container. The container must be labeled with a sticker displaying the word, "Carcinogen", and collected by the Hazardous Materials division of OSEH.
- c) If the bedding is wet (such as when a water bottle leaks and floods a cage) the bedding must be collected and disposed of in a similar manner.

5. Routine Animal Health Checks. Daily animal health checks will be conducted as described in the ULAM document "Standard Operating Procedure for Rodent Health Check."
6. Disinfection/Sterilization
 - a) General Disinfection: The following disinfectants, listed with the appropriate dilutions, are used within the containment rooms as detailed in the ULAM document, "Husbandry Protocol for Microisolation (MI) Cages"
 - Clidox (1 part base : 10 parts water : 1 part activator) in spray bottles maintained within the BSC
 - SporKlenz (3 cups SporKlenz : 12 cups (or 1 gallon) distilled water) in the dip box maintained within the BSC
 - Bleach (1 part bleach : 30 parts water) for mopping the floor.
 - b) Room/Cubicle Disinfection:
 - Floors in the animal holding rooms and anterooms (if present) will be swept and mopped with bleach water a minimum of once per week and after pan scraping or cage changes.
 - Rooms/cubicles will be sanitized when emptied. Consult the ULAM document, "Room Sanitization SOP."
 - If a rack is pulled out of a cubicle for any reason (such as to facilitate cage changing), the area outside of the cubicle, in the path of the rack, will be mopped with bleach water before another cubicle may be entered.
 - The mop and bucket should not be removed from the room.
 - Supplies from the containment area should never be used in other areas.
 - c) Biological Safety Cabinet Disinfection
 - The hood must be disinfected with clidox in between handling animals from different investigators and between handling animals from different cubicles (where applicable).
 - (i) Wet all surfaces in the hood except those exhausting or supplying air
 - (ii) These surfaces should be wiped with a paper towel to evenly distribute the disinfectant without drying. Ideally, allow the disinfectant to be in contact with the surface for a minimum of 10 minutes before working in the area. This allows adequate contact time between the disinfectant and the surface.
7. Contaminated Food, Water, and Bedding Disposal
 - a) All cages, water bottles, and equipment must be decontaminated before they are released to the cage wash area.
 - b) Infectious agents: Cages or pans with soiled bedding should be autoclaved without the bedding being removed. Food shall be autoclaved with the caging. Autoclaved food and bedding can then be scraped from the cages in the cagewash room in the usual manner
 - If cages, pans, or wastes must be transported through the hallways to reach the autoclave, they must first be bagged in commercially produced biohazard bags and sealed.
 - Cages that are too large to be autoclaved may be hand washed in the sink in the containment room. The cages should be sprayed with large quantities of bleach freshly diluted to a concentration of 1 part bleach : 32 parts water and allowed to remain in contact with the bleach solution for a minimum of 20 minutes. After this time, cages are to be moved directly to the cagewash room for immediate washing. The cages should be so labeled for the benefit of cagewash personnel.

- Water bottles should be transported in a covered box from the containment room and autoclaved prior to dumping and washing.
 - Alternate disposal methods may be acceptable with prior approval of the Containment Coordinator and OSEH. For instance, food and bedding can be collected in a downdraft dump station in the room and then incinerated; cages may be soaked in a bleach solution prior to transport to cagewash.
- c) Chemicals or Toxins:
- All waste products from the animals should be considered contaminated.
 - Soiled bedding must be gently removed from cages or pans in the room before moving them to the cage washer. A HEPA filtered bedding dump station or biological safety cabinet must be used. All solid wastes (bedding, food, and disposable supplies) from the animal room must be collected in waste containers provided by OSEH. Containers must be labeled with the hazardous substance.
 - DO NOT autoclave waste.
 - OSEH should be contacted for instructions on disposal. OSEH will review waste procedures with the PI prior to the start of the project and will notify ULAM if there are any additional requirements regarding waste disposal.
 - If the chemical agent is administered in the drinking water, waste water must, depending on the volume, either be poured into the container containing dirty bedding (being certain that all water is absorbed by the bedding or adding additional clean bedding to prevent leakage) or poured into a carboy labeled with the name of the chemical agent and its concentration. OSEH should be contacted for instructions on disposing of contaminated water.
 - Unless a chemical agent is delivered via the water bottle, the bottle must be soaked in a 1:32 bleach solution for 20 minutes prior to its transport to the cagewash.
 - Deviations from this protocol will only be permitted if approval is granted by OSEH and ULAM.
 - After collecting dirty bedding or any contaminated water, all dirty cages, water bottles, and equipment (which had been previously soaked in bleach) should be transported directly to the cagewash area and washed immediately. A sign should be affixed to the equipment to notify cagewash personnel that the equipment is from containment housing and should be washed as soon as possible. Dirty equipment should not be left in the cagewash area for any length of time. Husbandry-owned equipment that cannot be sent through the cage washer should be cleaned in a manner known effective for the given agent. OSEH should be consulted for guidance in choosing appropriate deactivation procedures.
8. Carcass disposal:
- a) Animal carcasses must be contained within two sealed, leak-proof biocontainment bags prior to removal from the animal room.
 - b) If carcasses are to be returned to the laboratory, they must be placed in a leak-proof container during transport.
 - c) For animals inoculated with infectious agents the outer bag must be clearly labeled with a biohazard label. All labeled, double bagged animal carcasses

should then be placed in the designated area within the cooler. These carcass barrels are ultimately incinerated.

- d) OSEH will review waste procedures for carcass disposal with the PI whose animals are treated with chemicals or other hazardous substances prior to the start of the project and will notify ULAM if there are any additional requirements regarding disposal. A specific area of the cooler will be designated for these barrels.
 - e) Radioactive animal carcasses are disposed of in a separate cooler designated for radioactive materials (see Radiation Safety Services protocol entitled, "Standard Procedures and Protocols for Using Radioactive Material in Animals").
 - f) OSEH should be consulted for proper disposal of all carcasses perfused with a chemical (such as paraformaldehyde).
9. Trash Containers within Containment Rooms
- a) All non-sharp, disposable materials not believed to be contaminated with a hazardous substance can be placed in trash receptacles within the containment room.
 - b) Separate, covered trash receptacles must be maintained and clearly labeled for each type of hazardous substance (ie. infectious or chemical) present within a room.
 - c) A biohazard bag will be used as the liner for the trash receptacle.
 - d) When the trash liner is at most three quarters full, it should be sealed and removed from the trash receptacle.
 - e) Trash bags containing materials potentially contaminated with infectious materials should then be immediately placed within another biohazard bag, sealed, and taken to the appropriate autoclave for disinfection.
 - f) Trash bags containing materials potentially contaminated with chemical agents should then be immediately placed within another biohazard bag, sealed, and placed in the carcass barrel designated for carcasses from containment rooms. These carcass barrels are subsequently incinerated.
 - g) Trash should be removed from the room and appropriately decontaminated or disposed of on cage change days or at least once a week.
10. Sharps Containers
- a) At least one sharps container is maintained in each containment room
 - b) The room technician will replace and appropriately dispose of the containers when full (see the ULAM document, "Sharps Disposal SOP").
 - c) A biohazard sticker must be placed on all sharps containers.
11. Operating the autoclave
- a) Instructions should be located on or near the autoclave detailing its use.
 - b) A strip of autoclave tape should be affixed to each item or collection of items placed in the autoclave to indicate that it has been autoclaved.
 - c) A Kilit ampule is run weekly by the animal room technician. Results are reported to the ULAM Husbandry Supervisor and to the director of the ULAM Animal Diagnostic Laboratory to ensure the autoclave is reaching the appropriate temperature. Logs are maintained of previous results for each autoclave as detailed in the ULAM document, "Protocol for Monitoring the Effectiveness of Sanitation Equipment and Practices."

H. SPILLS OF HAZARDOUS SUBSTANCES: Work surfaces must be decontaminated after use or after spills of hazardous substances.

1. Infectious agents: All cleaning should be performed using techniques that require minimal force for removal and disruption of the biologic material.
 - a) Wet contaminated surfaces before scrubbing to minimize spread of dry debris and to facilitate its removal.
 - b) Cover the spill area with freshly mixed 10% bleach and water solution.
 - c) Allow the solution to soak into biohazardous material for 20 minutes prior to cleaning up contaminated areas.
 - d) Work from the outside edges of the spill inward when applying the bleach solution.
 - e) Wipe up decontaminated material with paper towels or absorbent pads.
 - f) Place cleanup materials in an autoclave bag or a 5 gallon white pail.
 - g) Ensure lids are firmly sealed on all waste containers when spill clean-up is complete.
 - h) Contact OSEH HazMat at 3-4568 for disposal of waste materials
2. Chemicals or toxins: Alert people in the immediate area of the spill. Call OSEH HazMat at 3-4568 to report the spill. If after hours, contact the Department of Public Safety (DPS) at 3-1131 or 911 to report the spill.

I. CONSIDERATIONS SPECIFIC FOR RESEARCHERS:

1. Initial Review of Application to Use Vertebrate Animals in Research, Testing, or Instruction (Form 8225)
 - a) When an investigator proposes to use a hazardous substance (infectious agent, toxic chemical, or radioisotope) in animals, he/she must obtain approval from the University Committee on Use and Care of Animals (UCUCA) by submitting an Application to Use Vertebrate Animals in Research, Testing, or Instruction (Form 8225).
 - b) Within the protocol application, the PI must identify all potentially hazardous substances to which animals may be exposed.
 - c) It is the PI's responsibility to investigate and present a summary and relevant literature detailing the hazards associated with proposed agents when administered to animals. Based upon their understanding of the hazards, the PI will propose an animal biosafety level to be followed. This recommendation will be reviewed by appropriate safety officials for adequacy.
 - d) Occasionally, investigators will propose unique containment procedures for use with their protocols that must be evaluated for their adequacy. The PI must indicate that they will follow all procedures outlined in this SOP or clearly specify other procedures, equipment, etc that will be used to decrease or eliminate hazard exposure. Hard or electronic copies of any literature cited in support of the proposed departures from this SOP must be provided. Providing only a literature citation is not sufficient.
 - e) Labs do not have to submit a Biohazard Information Sheet (currently known as a Hazardous Material Information Sheet) as previously required at the time of application submission. This sheet will be completed with the assistance of a ULAM supervisor when animal housing is initially requested.
 - f) Within ULAM, the ULAM Containment Coordinator has oversight of animal containment rooms and issues within ULAM pertaining to the use of hazardous substances in animal research. The Containment Coordinator will accept the guidance of the University of Michigan Office of Occupational Safety and Environmental Health (OSEH) and Institutional Biosafety

Committee (IBC) regarding the containment procedures necessary for each study.

2. Requesting Animal Biosafety Level 2 (ABSL-2) Housing
 - a) Ordering Animals Who will be Placed Directly into Containment Housing
 - Requests for containment housing must be placed with the ULAM Husbandry Supervisor for the proposed animals housing area either before the animal order is submitted or at least 72 hours before animals are placed in the containment room.
 - When an animal order is placed through the ULAM front desk for animals to be delivered directly to the containment housing area, a notation will be generated on the delivery schedule reviewed by ULAM husbandry personnel so noting their final destination.
 - b) Requesting Containment Housing for Animals Present on Campus
 - Requests for containment housing should be directed to the supervisors of the area where the lab would like their animals housed.
 - The following information should be provided at the time of the containment housing request:
 - (i) UCUCA protocol number
 - (ii) Type of hazardous substance (ie. infectious, chemical, radioactive)
 - (iii) Number of cages
 - (iv) Duration of necessary housing
 - (v) Responsible laboratory member's name and contact information
 - (vi) Requested procedure space
 - Requests for containment housing must be made before the animal order is submitted or at least 72 hours before animals are placed in the containment room. This is especially important if animals are not ordered through ULAM but will be housed in ULAM-managed space.
 - (i) If the housing request is not submitted 72 hours prior to the needed date, space and supplies may not be available within the housing room.
 - (ii) Repeated lack of appropriate notice by a laboratory will result in a fine or a restriction of their use of the containment areas.
 - If space is available within the containment housing area, the ULAM Supervisor will notify the investigator of the assigned room.
3. Reporting Animal Health Issues
 - a) Report deaths, illnesses, or problems to the area veterinary staff using the standard Animal Treatment Report (ATR) system (see the ULAM document, "Procedure for Completion and Handling of Animal Treatment Reports"). Emergencies occurring between 8AM and 5PM, Monday through Friday, can be reported by speaking directly with a veterinary technician (936-1037). If a technician cannot be reached directly, the ULAM front desk should be contacted (764-0277). Voicemail messages do not substitute for speaking with an individual as messages are collected only periodically throughout the day. On weekends, holidays, or after normal business hours, emergencies should be reported by calling the Department of Public Safety (DPS) at 763-1131.
4. Hazardous Substance Administration
 - a) Hypodermic needles and syringes should be used only for the parenteral injection or aspiration of fluids from laboratory animals and diaphragm bottles. Only needle-locking syringes or disposable needle/syringe units (i.e., the

needle is integral to the syringe) are used for the injection or aspiration of hazardous substances. Needles should not be bent, sheared, replaced in the sheath or guard or removed from the syringe following use. After use, the needle and syringe should be promptly placed in a puncture-resistant container (sharps container) kept in the animal room.

- b) Extra precautions must be taken at the time of agent administration due to the increased potential for human exposure due to the use of sharp instruments (needles, surgical instruments, etc) and due to the increased concentration of hazardous substances.
5. Required Use of Containment Equipment During Procedures
 - a) Unless previously approved, biological safety cabinets must be used for all husbandry-related activities as well as whenever procedures with high potential for creating aerosols are conducted. These include necropsy of infected animals, harvesting of infected tissues or fluids from animals or eggs, intranasal inoculation of animals, and manipulations of high concentrations or large volumes of infectious materials.
 6. Equipment Disinfection
 - a) All equipment (restrainers, glassware, instruments, etc) utilized during agent administration or handling animals after hazardous substance administration must be appropriately discarded or disinfected immediately after use and before removal from the containment room.
 - b) Equipment exposed to infectious agents should be washed with large volumes of water and disinfected with bleach (1:32 dilution of bleach in water)
 - c) Equipment exposed to chemical agents should be cleaned in a manner known effective for the given agent. OSEH can be consulted for guidance in choosing appropriate deactivation procedures.
 7. Transport of Animals Out of Containment Rooms
 - a) Animals may only be transferred to a standard (non-containment) animal room with prior approval given at the time of protocol review or by ULAM Containment Coordinator.
 - b) While working within a biological safety cabinet, place the animals in a clean transport cage (provided in each containment room) and leave all dirty caging in the containment room covered with a trash bag or with a micro-isolation filter lid covering the cage parts.
 - c) Cleaning of transport cages
 - If the animals transported out of the containment room no longer present a hazard, then the transport cages can be processed through the standard cage wash system.
 - If the animals transported out of the containment room may still pose a hazard, then the transport cages should be labeled with the PI's name and protocol number and returned to the original containment room for proper processing. These cages should never be placed directly into a cagewash facility.
 8. Animal Euthanasia
 - a) When possible, animals should be euthanized within the containment room through UCUCA approved use of injectable or inhalation agents (isoflurane, halothane, etc) or through use of physical means.
 - b) If carbon dioxide exposure is required for euthanasia, the animals should either be euthanized in the room (3520 ARF) or in the nearest euthanasia station. If euthanasia is required outside of the containment room, the

animals should be transported to the euthanasia station in a clean transport cage obtained from within the containment room. The animals should remain in the transport cage during euthanasia. Any surfaces that come in contact with the animals or transport cage must then be appropriately disinfected.

J. REFERENCE DOCUMENTS:

1. *Biosafety in Microbiological and Biomedical Laboratories*, published by the Centers for Disease Control and Prevention and the National Institutes of Health
2. *Occupational Health and Safety in the Care and Use of Research Animals*, published by the National Academy of Sciences
3. *Standard Procedures and Protocols for Using Radioactive Material in Animals* maintained by the University of Michigan Radiation Safety Services
4. *Biohazardous (Medical) Waste Disposal* maintained by the University of Michigan OSEH (<http://www.oseh.umich.edu/guidbmwd.pdf>)

K. APPENDIXES:

1. Hazardous Materials Information Sheet (HMIS)
2. Containment Room Sign

APPENDIX I

HAZARDOUS MATERIAL INFORMATION SHEET

Part I					
Investigator Name:					
Approval Number:					
Approval Period:					
Name of Person to Contact for More Information About This Request					
Contact Telephone Number					
Preferred Animal Housing Area (Check One)	<input type="checkbox"/> ARF	<input type="checkbox"/> Kresge	<input type="checkbox"/> MSRB	<input type="checkbox"/> SPH	<input type="checkbox"/> Other _____

Part II		
Hazardous Substances or Infectious Agents Being Used:	Animal Biosafety Level or Protocol:	Special Containment Equipment or Procedures

Part III		
Names of All Laboratory Personnel Requiring Access to Containment Housing Space:		
Names of Key Laboratory Personnel to Be Contacted Regarding Animal Deaths, Illness, or Other Problems:	Work Telephone Number	Home Telephone Number
Name Of Individual Responsible for Posting and Removing Containment Room Sign (Complete for Non-ULAM Areas Only)		

Part IV			
Species Being Used	Number of Cages:	Number of Animals Per Cage:	Containment Housing Room (Assigned by Supervisor)
Date Animals Should Be Placed in Containment Housing Area	Date Hazardous Substance Will Be Administered to Animals	Date Animals Will Be Removed From Containment Housing Area	



HAZARDOUS SUBSTANCE	
CLASS OF HAZARD (toxic, chemical, infectious)	
ANIMAL BIOSAFETY LEVEL	

INVESTIGATOR	
TELEPHONE NUMBER	

LABORATORY CONTACT	
TELEPHONE NUMBER	

SUPERVISOR RESPONSIBLE FOR THIS ROOM	
TELEPHONE NUMBER	

SPECIAL REQUIREMENTS FOR ENTRY