OAKLAND UNIVERSITY

Institutional Animal Care and Use Committee

Policy on Animal Biosecurity

Purpose

The purpose of this policy is to define objectives and establish procedures to provide an effective animal biosecurity plan at the Biomedical Research Support Facility (BRSF), Oakland University's core animal research facility. The IACUC endeavors to cooperate with investigators who are using animals in their research in achieving and maintaining the high standards of biosecurity that are necessary to support excellence in animal related research.

This policy applies to all research personnel working with animals within the BRSF and all Principal Investigators (PIs) using animals in their research labs at Oakland University.

Animal biosecurity is a way to protect the animals used in research by preventing the introduction or transmission of overt disease or unexpected experimental variability by infectious agents. The following are examples of the adverse impact a breach in biosecurity can have on:

- Animal populations –for example, the status of specific pathogen free (SPF) populations may be compromised.
- Personnel – animals may be infected with zoonotic organisms, which can infect humans.
- Research – infectious agents and pathogens can significantly alter research outcomes and may affect the biological functions of infected animals. Even an infection that does not cause apparent illness, can act as a variable affecting many biological functions including, but not restricted to, physiology, metabolism, and immune responses.

Background

Practicing high standards of animal biosecurity is clearly in the best interest of the research community of Oakland University. To assist investigators in implementing effective biosecurity, the IACUC has compiled an overview of biosecurity risk factors and the current guidelines and procedures for their mitigation.

Biosecurity risks that pose a threat to animal populations or research outcomes can vary by type, extent, and introduction. The following are examples of ways biosecurity risks can be introduced, and how these risks may be addressed:

- Infectious agents: Administrative procedures that include following specific traffic patterns for people and clean vs. used cages and equipment within the Biomedical Research Support Facility (BRSF), and inter-facility health testing of animals before transfers minimize the introduction and spread of infectious agents. However, exposure of uninfected colonies to previously excluded agents must always be considered a risk.

- Infectious agents in shared research support areas: Diagnostic and testing equipment such as biosafety cabinets, transfer stations, microscopes, etc., may be shared and/or used in collaborative studies. Thus, traffic (animals and personnel) can cause cross contamination from these shared resources.

- Infectious agents from labs outside of the BRSF: Several investigators work with their animals in labs that are located outside of the BRSF. Cross traffic includes personnel entering and leaving different animal housing rooms, procedure rooms, and facility corridors, and taking animals through public hallways to their labs. Investigators that perform animal research in their labs should constantly be aware of the health status of the animals. Appropriate precautions must be taken to ensure that investigators and their personnel do not spread agents to the BRSF (core animal facility).

- Infectious agents from colonies of outside institutions from which animals are imported to the BRSF: When an investigator imports animals from another institution, there is a risk of exposing existing colonies to infectious agents. Pre-screening of the health status and surveillance reports from the institution providing the animals, and the ability to reject animals capable of introducing disease, can help prevent the introduction of infectious agents.

- Infectious agents in vendor colonies: Approved commercial vendors practice continuous health status monitoring, use barrier-protected housing, and maintain high management standards with prompt reporting of suspected disease outbreaks. Animals from these sources are assumed to be clean and are allowed into animal rooms without quarantine and testing. However, a minor degree of risk remains. Ongoing monitoring of vendor health reports is necessary.

- Infectious agents in pets at home or wild rodents: Pet animals, are almost never tested for pathogens. Both pets and wild rodents can be carriers of one or more pathogens not present in the animal colonies at Oakland University. Any direct contact (e.g. with pet animals) or indirect contact (e.g. accidental contact with fecal droppings of wild rodents when cleaning out the garage) with these animals carries the risk of introducing pathogens into University colonies if no preventative or decontamination measures are applied.

- Transfer of animals within the BRSF: Room to room transfer of animals, increases risk by potentially introducing a pathogen into a room of animals that are specific-pathogen-free. An emerging pathogen outbreak may not yet have been detected in the source animal's room at the time of transfer.

- Cross traffic: Under the existing conditions at the University, cross traffic of personnel is often unavoidable and occurs frequently. Personnel may enter and leave different animal facility corridors, animal housing rooms, procedure labs, and/or PI labs where animals are present. Corridors and rooms within the BRSF are maintained as defined locations with regard to animal health status; cross traffic poses the risk of carrying an undetected rodent pathogen from one site to another.

- Fomites: A fomite is any inanimate object capable of transmitting infectious agents. Any inanimate, contaminated object or substance may potentially transfer an agent from one place to another. The associated risk is similar, and often connected, to that of cross trafficking, with the added risk of possible cage-to-cage transfer.

- Biologicals (cell lines, antibodies, etc.): Any type of biological substance that at some point was in contact with or derived from rodents must be considered suspect for contamination with unwanted

infectious agents.

- Inadequate adherence to attire requirements, designated traffic patterns within the BRSF, proper use of biosafety cabinets, chemical fume hoods, and other lab equipment: Negligence in adhering to carefully designed preventative measures for the control of transmission of pathogens can significantly increase the risk of disease spread.

- Improper adherence to Standard Operating Procedures (SOP) and Special Animal Safety Protocols (SASP) posted by the IACUC and the Institutional Biosafety Committee (IBC) when working with animals using infectious agents, bloodborne pathogens, recombinant DNA, cultured cell lines, biologically derived toxins, etc., can carry additional risk to human health and welfare and/or the spread of infectious agents between animal populations.

- Inadequate techniques used in disinfection of instruments; decontamination of equipment, procedure labs, and other animal use sites; and handling micro-isolator caging: If inappropriate methods are, used risks may rise significantly.

Implications
Despite strict policies on animal importation and careful management practices, the animal colonies housed in the BRSF remain vulnerable to new outbreaks due to the many risk factors and special conditions that exist in the University's research environment and continued vigilance is important

Requirements and Procedures
The IACUC recommends or requires the following methods to minimize the risk of pathogen transmission:

1. Personnel should adhere to protective procedures currently in place. Personnel should be aware of the order of rooms entered throughout the day (traffic patterns); including animal rooms, labs, and cage wash and cage storage areas. Personnel must change attire following the requirements written in the IACUC policy *Appropriate PPE and Apparel to be Worn While Working in the Animal Facility*. Similarly, appropriate PPE (personal protective equipment) must be worn while working in shared resource sites and PI labs.

2. Disinfection or decontamination of all use areas and equipment coming in direct contact with animals or caging systems must be carried out both before and after use (analogous to routine decontamination procedures when utilizing a cell culture hood).

3. Prompt and adequate disinfection or decontamination of PI lab spaces in which animals are used must be part of laboratory routine. For mitigation of risk associated with cross trafficking, all lab personnel and visitors should be made aware of the source housing facility of the animals used in the lab. Fomite transmission may be controlled by having dedicated instruments and equipment for each use site, or by adequate disinfection of this equipment before transfer to a new use site.

4. Personnel working directly with rodents should refrain from keeping rodent pets at home. A pest control program is in place to exclude unwanted arthropods and wild rodents from BRSF.

5. Investigators wishing to import animals from other institutions (non-approved sources) are required to complete a *Notice of Intent to Procure Animal Research Subjects* form. A review of the health status and surveillance reports of the animals from the outside institution must be completed and approved by the

University Veterinarian and the BRSF Manager before importation can be approved. All animals received, either from commercially approved vendors or from other institutions are subject to acclimation and observation periods before being used in a research study.

6. All animals housed in the BRSF are to be appropriately separated by species and health status. Rodents from more than one source but of the same microbiologic status can be housed together in animal housing rooms to accommodate space and housing limitations, but there must be no mixing of species within the same animal housing room. Animals exhibiting signs of illness are to be examined, and diagnostic procedures and treatments instituted as appropriate. All animal species used in chronic studies are subject to a minimal acclimation period. The acclimation period for rats and mice is 24 hours. The acclimation period for guinea pigs and rabbits is 48 hours. The acclimation period for higher species, e.g. dogs, cats, pigs, etc. is 72 hours.

7. Because the production processes of biological substances are often unknown but may entail contact with contaminated equipment or materials, it is necessary to ensure that biologicals to be used in live research animals are free of agents known to interfere with research results or having zoonotic potential. This is achieved by requiring a relevant manufacturer's quality control certificate be submitted for each biological substance being used or proof that the biological substance is laboratory tested for the absence of animal pathogens.

8. Rodent colonies housed in the BRSF are monitored for current rodent diseases through the Sentinel Rodent Health Surveillance Program (health monitoring). At each bedding change, soiled bedding from a representative sampling of cages is added to the sentinel cage, thus exposing the sentinels to diseases carried by the colony. Sentinel animals are evaluated for viruses, bacteria, and parasites, every four months to help define the health status of the rodent populations. The Health Surveillance Program is crucially important in rodent disease prevention. It is the only reliable basis for defining rodent pathogen status and providing health quality assurance.

9. Containment and eradication; measures may need to be implemented to contain and eradicate infections. This will be done under the direction of the University Veterinarian.

Additional Information

For further information, please contact the University Veterinarian penman@oakland.edu, the BRSF Manager schofdin@oakland.edu, or call 248-370-4440.

References

1. http://www.iacuc.uiuc.edu/policies/rodent_biosecurity.html

2. Policy Number: A-005 – Animal Biosecurity, VA Pittsburgh Healthcare System Research and Development. 04-26-16.

3. Policy: Rodent Biosecurity at the University of Pittsburgh