



Rodent Biosecurity at UIUC

Introduction: Rodent biosecurity, intended to protect rodents used in research from infectious organisms, impacts the animals, the personnel in contact with them, and the research.

Maintaining uninfected rodent populations protects the animals' health and welfare, as infectious organisms can cause morbidity and/or mortality. Also, some organisms that infect rodents may be transmitted to humans, so rodent biosecurity affects personnel safety. Finally, infection of a rodent colony may affect research results, because even an infection that does not cause illness can act as a variable in many biological functions, including, but not restricted to, physiology, metabolism, and the immune system.

Rodent Biosecurity Limitations: There are conditions hindering UIUC rodent biosecurity. Currently, there are disease agents present in campus rodent colonies. Some animal colonies have had enzootic infections for several months, and occasional epizootics outbreaks occur in previously uninfected colonies. While careful management procedures such as following traffic patterns and disinfection minimize the risk of spread of the agents on campus, the presence of these agents remains a direct risk to uninfected colonies.

New agents may be introduced to UIUC facilities. There are frequent shipments of rodents onto campus. Most of these rodents come from approved sources with a low risk of carrying infection, such as commercial vendors that practice continuous health status monitoring and protective housing and management standards. Because of the low risk, these animals are assumed to be clean and are allowed into animal rooms without a quarantine period. However, some risk remains.

Some rodents originate at other research institutions, and carry more risk because the health monitoring program, husbandry, and management at other institutions cannot be verified as comparable to those of the commercial vendors. The health status of these animals is investigated, and if it appears likely that they are free of infectious agents, they are allowed onto campus under quarantine with further testing, either within the animal facility or in a satellite room.

Wild mice carry many infectious agents, and may gain access to an animal facility, exposing research rodents. Personnel with pets or other exposure to rodents may introduce infectious agents into an animal facility.

The most significant risk to most rodents on campus is the lack of adequate cage level protection from infectious agents. Most rodents are currently housed in conventional, open caging (wire bar lids without filter tops), and many of those housed in microisolation caging (filter tops) are not handled with adequate isolation practices. The industry standard for protecting rodents from infectious agents requires microisolation caging, HEPA-filtered cage change hoods, and protective procedures for cage handling.

Implications: Despite a strict campus policy on rodent importation and quarantine and careful management practices, the majority of rodents on campus remain susceptible to the persistence of

previously detected agents and to new outbreaks due to the lack of adequate cage level protection from infectious agents.

The anticipation should be that rodents housed in conventional caging will periodically have outbreaks of infectious agents, and most colonies will eventually have an outbreak. Unfortunately, if an effort is made to eliminate an infectious agent from a colony, such an effort may be unsuccessful with rodents housed in open caging. Even if the agent is successfully eliminated, the clean colony remains susceptible to reintroduction of the agent.

Recommendations DAR recommends the following methods to minimize the risk of infection:

Personnel should adhere to protective procedures already in place. One should be aware of the order of rooms one enters throughout day (traffic patterns), including animal rooms, labs, and cage washing and cage storage areas. Use of animals within one room, such as a lab, must be considered also, if animals of different health status are used. Prompt and adequate disinfection of lab spaces in which animals are used should be part of laboratory routine. Personnel should change lab coats or clothing as necessary to minimize the spread of infectious agents.

Protective caging and management of rodents would significantly minimize the risk of infection.

Specifically, this includes:

Microisolation caging, either static (free standing cages) or ventilated (cages placed on special racks that provide filtered ventilation for each cage)

HEPA-filtered hoods to be used when cages are opened for changing, research procedures, or clinical procedures

Proper protective procedures for cage handling while using the filtered hoods.

Conclusion

Given the limitations of protecting rodents through quarantine procedures and traffic patterns, DAR recommends that investigators who desire a high degree of confidence that their rodents will remain uninfected should house them in microisolation caging and utilize appropriate isolation practices.