

Zoonoses Associated with Rodents

This document provides information on various diseases that can be passed from mice, rats, gerbils, hamsters, guinea pigs and other rodent species to people. Often these diseases do not make the animal appear sick but can cause serious illness in humans. Persons with specific medical conditions such as a chronic illness, immunodeficiency and pregnancy may be at higher risk of developing disease or complications from a zoonotic disease and should consult with their physician before working with animals.

The majority of rodents housed at UI are bred and raised under strict hygienic conditions and are free of pathogens that could be transferred to people. These rodents are called “specific pathogen-free” or “SPF” rodents. Rodents that are housed outdoors, captured from wild populations or that are purchased from a pet store or from a breeder who sells rodents as feed for reptiles may carry zoonotic diseases. Zoonotic diseases associated with rodents include rat bite fever, tularemia, hanta virus, lymphocytic choriomeningitis virus, leptospirosis, salmonellosis, and campylobacteriosis.

Rat Bite Fever caused by *Streptobacillus moniliformis* or *Spirillum minus* is a bacterial infection of rodents that is transmitted through bites, scratches, direct contact with animals and their urine, saliva and feces or ingestion of contaminated food or water. Infected rodents typically exhibit no symptoms of disease. Tularemia is another bacterial infection of rodents. Infected rodents appear lethargic but they may shed bacteria before showing illness. It is transmitted to people in the same manner as rat bite fever but in addition can be transmitted through the bite of an infected tick. Both diseases in humans initially present as a fever, headache, swollen lymph nodes and possibly a rash or ulcer in the area of a recent bite or scratch wound. Any bites or scratches should be thoroughly washed immediately to minimize the chance of infection.

Rodents with hanta virus, lymphocytic choriomeningitis virus (LCMV) and leptospirosis usually do not exhibit signs of disease. The disease agents are typically shed in the urine of infected animals and people acquire the infection by inhalation, oral ingestion and direct contact with contaminated urine or feces. These are occasionally transmitted from bite wounds and *Leptospira* can infect people through abraded skin. These diseases often initially appear as a mild flu-like illness in people but may progress to severe disease. LCMV infection is considered hazardous to the unborn fetus. Please refer to the UI Hantavirus guidelines if working with wild rodents or in rodent-infested areas and buildings. Salmonellosis and campylobacteriosis are acquired by contact and accidental ingestion of fecal material from infected rodents. Animals infected with these diseases may have diarrhea but some may show no symptoms of disease. Any animal with diarrhea should be suspected of having a zoonotic disease.

Individuals with exposure to animals and animal environments may develop allergic reactions to animal proteins (allergens). Approximately 20-30 percent of individuals working with laboratory animals will develop an allergic reaction to animal proteins and 5 -10 percent of individuals will develop asthma. Personnel may be exposed to allergens through inhalation and contact with skin, eyes and mucous membranes. Animal allergens may be present in animal dander, hair, skin, urine, saliva, serum and any contaminated feed or bedding materials. Risk factors for developing an allergic reaction include history of

previous allergies to animals. The signs and symptoms of an allergic reaction are nasal discharge and congestion, conjunctivitis, tearing and eye itching, skin redness, rash or hives and lower airway symptoms (coughing, wheezing and shortness of breath). Individuals with symptoms suggestive of an allergic reaction related to a workplace allergen should report their concerns to their supervisor and consult a physician.

Wild, outdoor-housed and pet-store purchased rodents are much more likely to carry infections than those raised and housed in a laboratory setting. Transmission of zoonotic diseases from rodents is primarily by direct contact, bites, indirect contact with contaminated objects, oral ingestion or inhalation of aerosolized bedding, feces and urine. We can protect ourselves from most diseases by using the following basic hygiene procedures:

- Do not eat, drink, apply makeup or use tobacco products while handling animals or in animal housing areas.
- Wear respiratory protection when appropriate.
- Wear gloves when handling animals, animal tissues, body fluids and waste and wash hands after contact.
- Wear dedicated protective clothing such as a lab coat or coveralls when handling rodents. Launder the soiled clothing separate from your personal clothes and preferably at the animal facility.
- Report ill animals so that they can receive veterinary care.
- Keep animal areas clean and disinfect equipment after using it on animals or in animal areas.
- Thoroughly wash any bite or scratch wounds and report injuries.

Most importantly, familiarize yourself about the animals that you will be working with and the potential zoonotic diseases associated with each species. If at any time, you suspect that you have acquired a zoonotic disease, inform your supervisor and seek medical care.

If you have further questions, contact:

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