



# Rodent

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(Rodents in use at UT Southwestern include: mice, rats, hamsters, guinea pigs and chinchillas.)

All employees and students working with animals should be aware that laboratory animals might bite, kick, or scratch. In addition, handling of cages, pens and other equipment could cause cuts or scratches which could potentially expose the employee to viral, bacterial, parasitic or allergic agents, which are transmissible from animals to humans. Animals respond to sounds and smells in the same manner as people, however, they can hear, smell and react to things that people might not detect. Unexpected and sudden movement by an animal can produce injury to an animal handler. Many animals have a “flight zone,” in which approaches by another animal or a person cause an attempt to escape. Although the risk of bites, kicks and scratches is species dependent; there are a few simple guidelines, which if followed, will significantly reduce the potential risks of such incidents. These include:

- Always wear appropriate personal protective equipment, especially hand and face/eye protection.
- If moving large contaminated items (e.g. non-human primate cages), wear heavy gloves.
- When available and appropriate, use mechanical restrainers according to IACUC guidelines when performing procedures on unanesthetized animals.
- All bites and scratches that result in bleeding should be immediately and thoroughly scrubbed and cleansed with soap and running water for at least 15 minutes. Notify supervisor and seek medical attention immediately.
- There are some potential hazards inherent in any work environment. These include poor ergonomics, slips and falls, electrical safety hazards, etc. UT Southwestern Medical Center has developed a wide range of environmental health and safety guidelines to address these potential hazards.

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## **ALLERGY HAZARDS**

One of the most common health concerns in the laboratory animal setting is a work-associated allergy. The risk of developing an allergy depends on parameters such as species, facility, ventilation, and the employee's "base-line" health status. There are also several individual risks which can be divided into four overlapping Risk Groups:

- **Normal:** No evidence of allergic disease;
- **Atopic:** Pre-existing allergic disease;
- **Asymptomatic:** Antibodies to animal allergens;
- **Symptomatic:** Clinical symptoms on exposure to allergenic animal proteins.
  - Symptoms of allergic reaction vary depending on the severity of the reaction and include:
    - **Contact urticaria** with symptoms such as: redness, itchiness of skin, welts and hives;

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- **Allergic conjunctivitis** with symptoms such as: itchy, burning, running or red eyes.
- **Allergic rhinitis** with symptoms such as: sneezing, itchiness, clear nasal drainage, nasal congestion;
- **Asthma** with symptoms such as: cough, wheezing, chest tightness, shortness of breath;
- **Anaphylaxis** with symptoms such as: generalized itching, hives, throat tightness, eye or lip swelling, difficulty in swallowing, hoarseness, shortness of breath, dizziness, fainting, nausea, vomiting, abdominal cramps, and diarrhea.

*All Rodent Areas:*

Conventional and barrier rodent environments have allergens present, such as dust from bedding and animal dander. High risk exposure activities include cage wash, cage changing, and experimental work with animals that haven't been anesthetized. Exposures are also higher in rooms without microisolator lids.

**HOW TO PROTECT YOURSELF**

- Wearing appropriate PPE and respiratory protection can help to limit the amount of animal dander exposure.

**INFECTIOUS DISEASE HAZARDS**

Laboratory rodents rarely transmit zoonotic infections anymore, because they are supplied by commercial vendors who eliminate these infections from their stock.

- **Lymphocytic choriomeningitis:** LCM is an arenavirus commonly associated with hamsters, but does infect mice. In 1965, during an outbreak in hamsters, 23 human cases were recorded. Now rare in laboratory animal facilities, LCM has been eliminated from most vendors through breeding and viral screening of their colonies.
  - **Reservoir/source of infection:** Wild mice worldwide are the reservoir of infection to laboratory and pet rodents. Mice and hamsters are the only animals known to develop latent infection; experimentally transplanted tumors are the other source of infection to mice.
  - **Transmission:** Contact with tissues including tumor, feces, urine, and aerosolization of all of the above.
  - **Disease in people:** Flu-like symptoms, mild to severe
- **Leptospirosis:** Leptospira spp. are bacteria found in many animals but are most commonly associated with livestock and dogs. Transmission from laboratory rodents to people has been reported.
  - **Reservoir/source of infection:** Rats, mice, voles, hedgehogs, gerbils, guinea pig, squirrels, rabbits, hamsters, reptiles, dogs, sheep, goats, horses, standing water.
  - **Transmission:** Leptospirae are shed in the urine of infected animals. Direct contact with urine or tissues via skin abrasions or contact with mucous membranes has been reported. Transmission can also occur through inhalation of infectious droplet aerosols and by ingestion.
  - **Disease in people:** Flu-like symptoms, mild to severe. Death has been reported.
- **Rat bite fever:** This is caused by the bite of a rat/mouse infected with *Streptobacillus moniliformis* or *Spirillum minus*.
  - **Reservoir/source of infection:** Rats and mice are asymptomatic carriers. Bacteria are normal flora in oral pharynx of rats/mice.

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- **Transmission:** Bite of infected rat/mouse.
- **Disease in people:** Fever, lymphadenopathy, swelling at site of wound. Incubation period usually 1-3 days but may be up to 6 weeks. May cause arthritis in untreated patients but is easily treated with penicillin.
- **Hantavirus Infection:** Hantaviruses occur among wild rodent populations.
  - **Reservoir/source of infection:** Rats and mice have been implicated in outbreaks of the disease. Hantavirus infection from rats has occurred in laboratory animal facility workers. Rodents shed the virus in their respiratory secretions, saliva, urine and feces.
  - **Transmission:** Via inhalation of infectious aerosols - brief exposures of even 5 minutes have resulted in human infection.
  - **Disease in people:** The form of the disease that has been documented after laboratory-animal exposure is characterized by fever, headache, myalgia and petechiae and other hemorrhagic symptoms, including anemia, gastrointestinal bleeding etc.
- **Balantidium coli:** a ciliated protozoan, is another enteric pathogen common in guinea pigs.
- **Other infections:**
  - **Bacteria** - There are several bacterial pathogens, including Salmonella spp. and Campylobacter spp., that are frequently associated with diarrhea in rodents and may also cause disease in people.
  - **Skin fungi and mites** – which infect rodents can be transmitted to humans and cause dermatitis

#### **HOW TO PROTECT YOURSELF**

- Always wear appropriate personal protective equipment, especially hand and or face/eye protection
- **Until you have washed your hands, keep them away from your mouth, nose and eyes.**
- Do not eat, drink or store food in research areas.
- Do not handle contact lenses in the laboratory. Wearing of gloves, lab coat or scrubs is required. Other personal protective equipment such as dust/mist masks or approved respirator masks (e.g., Type N95 by 3M company) are strongly recommended when working with animals.

#### **PHYSICAL HAZARDS**

- **Bites and scratches:** The potential for receiving a bite or scratch is an ever-present hazard that faces all employees working directly with laboratory animals and related equipment. Employees should be properly trained in handling and general restraint techniques of the species they are assigned to. Additionally, all staff should be familiar with first aid procedures specific to each species
- **Needlestick / Sharps injury**

#### **HOW TO PROTECT YOURSELF**

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- Proper training and awareness of animal behavior are vitally important to avoid injuries.
- When available and appropriate, use mechanical restrainers when performing procedures on unanesthetized animals.
- All bites and scratches that result in bleeding should be immediately and thoroughly scrubbed and cleansed with soap and running water for at least 15 minutes.
- Read and understand the protocol-related procedures before you start the experiment. If necessary, do a dry run.
- Do not recap needles; dispose of them in appropriate sharp containers and avoid using sharps whenever possible by substituting manually operated pipettes for needles and syringes, and cannulae for needles.
- Use safety needles and sharp devices.
- **Until you have washed your hands, keep them away from your mouth, nose and eyes.**
- Please read and understand the special safety requirements for each work area or animal species.
- Clean all spills immediately.
- Report all incidents or equipment malfunctions to your supervisor immediately.

### **PROTOCOL RELATED HAZARDS**

Protocol-related hazards are defined as those specifically associated with either routine operational or experiment-specific protocols. Some general hazards also associated with protocols, such as the risk of fire in the use of bunsen burners or torches, or electrical hazards in the use of experiment-specific equipment, are not included in the category of protocol-related hazards. Protocol-related hazards are protocol-specific. For example:

- Hazards associated with the use of a specific viral vector carrying a transgene for toxin production or with a piece of prototype equipment to perform an experimental task.
- Experimental studies can involve any number of hazards such as the use of radioactive materials, infectious agents, toxins or toxic chemicals, flammable substances, etc.

### **HOW TO PROTECT YOURSELF**

- Follow the steps in your approved safety plan.
- Educate yourself on the protocol specific hazards.

*Additional information regarding various protocol-related hazards may be obtained from*

[www.utsouthwestern.edu/workerprotection](http://www.utsouthwestern.edu/workerprotection)