



Zoonotic Diseases – Rodents

Individuals who work with animals should be informed regarding potential zoonoses (diseases of animals transmissible to humans) and other potential hazards associated with animal exposure, as well as best practices for personal hygiene. This information sheet is for those who work with laboratory rodents (including rats, mice, hamsters, guinea pigs and gerbils).

Potential Zoonotic Diseases

Colony-born rodents are generally docile, but may occasionally bite or scratch. While rodents may carry organisms that may be potentially infectious to humans, the major health risk to individuals is the development of an allergy. The development of disease in the human host often requires a pre-existing state that compromises the immune system. If you have an immune-compromising medical condition, or you are taking medications that impair your immune system (steroids, immunosuppressive drugs, or chemotherapy), you are at higher risk for contracting a rodent disease and should consult your physician.

The following is a list of some of the potential rodent zoonoses.

Lymphocytic choriomeningitis (LCM): LCM is caused by the arenavirus commonly associated with hamsters, but does infect mice. LCM is more common in the wild and rare in laboratory animal facilities. Transmission to humans is through contact, including via aerosolization, with infected tissues including tumors, feces, urine. Disease in humans is generally flu-like symptoms that range from mild to severe.

Campylobacter: This is a gram-negative bacterium that has a worldwide distribution. Although most cases of human campylobacteriosis are of unknown origin, transmission is thought to occur by the fecal-oral route through contamination of food or water, or by direct contact with infected fecal material. The organism has also been isolated from houseflies. Campylobacter is shed in the feces for at least six weeks after infection. Symptoms are acute gastrointestinal illness: diarrhea with or without blood, abdominal pain, and fever. It may cause pseudoappendicitis and, rarely, septicemia and arthritis. Usually it is a brief self-limiting disease that can be treated with antibiotics.

Leptospirosis: These bacteria is found in many animals, but are most commonly associated with livestock and dogs. The source of infection may be rats, mice, voles, hedgehogs, gerbils, squirrels, rabbits, hamsters, reptiles, dogs, sheep, goats, horses, and standing water. Leptospire are in the urine of infected animals, and are transmitted through direct contact with urine or tissues via skin abrasions or contact with mucous membranes. Transmission can also occur through inhalation of infectious droplet aerosols and by ingestion. The disease in people is multi-

systemic with chronic sequelae. An annular rash often occurs with flu-like symptoms. Cardiac and neurological disorders may follow, and arthritis is a common result.

Hantavirus: Hantavirus occurs mainly among wild rodent populations. Rats and mice have been implicated in outbreaks. Infection from rats has very rarely occurred in laboratory animal facility workers. Rodents shed the virus in their respiratory secretions, saliva, urine and feces. Transmission to humans is via inhalation of infectious aerosols. The form of the disease that has been documented after laboratory animal exposure is characterized by fever, headache, myalgia (muscle aches) and petechiae (rash), and other hemorrhagic symptoms including anemia and gastrointestinal bleeding.

Other bacterial diseases: Several other bacterial diseases are possible, though are rarely spread through working with laboratory rodents. These include *yersinia* and *tularaemia*.

Allergic Reactions to Rodents

By far the greatest occupational risk of working with rodents is allergic reaction. Workers who have other allergies are at greater risk. Animal dander, hair, scales, fur, saliva and body waste, and urine in particular, contain powerful allergens that can cause both skin disorders and respiratory symptoms. The primary symptoms of an allergic reaction are nasal or eye symptoms, skin disorders, and asthma.

How to Protect Yourself

- **Wash your hands.** Wash hands and arms after handling any animal. Never smoke, drink, or eat in the animal rooms or before washing your hands.
- **Wear gloves.** Wear sturdy, impervious gloves when handling rodents, their bedding, or other potentially contaminated items.
- **Wear respiratory protection.** A dust mask should be worn when there is a risk of aerosol transmission of a zoonotic agent, or when there is a medical history of allergies. Respirator fit testing can be performed by appointment at EHS.
- **Wear other protective clothing.** Lab coats should be available and worn when working with rodents. Avoid wearing street clothes. Lab coats should be laundered at work.
- **Seek medical attention promptly.** If injured on the job, promptly report the accident to your supervisor even if relatively minor. Immediately cleanse minor cuts and abrasions with antibacterial soap, then protect from exposure to rats and mice. Seek treatment at the University of Colorado Hospital Emergency Department on the Anschutz Medical Campus for serious injuries.
- **Tell your physician you work with rodents.** Whenever you are ill, even if you're not certain that the illness is work-related, always mention to your physician that you work with rodents. Many zoonotic diseases have flu-like symptoms but would not normally be suspected. Your physician needs this information to make an accurate diagnosis. Questions regarding personal health should be answered by your physician.

Resource

Contact the EHS Occupational Health Clinic with any questions, 303-724-9145.