UCSC Biosafety - Information on Zoonotic Diseases

Species Specific Guide - Laboratory Rodents

This guide is designed to inform individuals who work with animals about potential zoonoses (diseases of animals transmissible to humans), personal hygiene, and other potential hazards associated with animal exposure. This information sheet is directed toward those involved in the care and use of laboratory rodents (including rats, mice, hamsters, guinea pigs & gerbils).

Potential Zoonotic Diseases

Colony-born rodents are generally docile, but may occasionally inflict injury such as a bite or scratch. While rodents may carry organisms that may be potentially infectious to humans, the major health risk to individuals working with laboratory rodents is the development of an allergy. The development of disease in the human host often requires a preexisting 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: Lymphocytic choriomeningitis (LCM) is caused by the arenavirus commonly associated with hamsters, but does infect mice. LCM is rare in laboratory animal facilities, more common in the wild. Transmission to humans is through contact with infected tissues including tumors, feces, urine, or aerosolization of any one of these. 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: Is bacteria found in many animals but are most commonly associated with livestock and dogs. The source of infection can be from any of the following: rats, mice, voles, hedgehogs, gerbils, squirrels, rabbits, hamsters, reptiles, dogs, sheep, goats, horses, and standing water. Leptospires 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 a multi-systemic disease with chronic sequelae. An annular rash is often present with flu like symptoms. Cardiac and neurological disorders may follow and arthritis is a common end result.

Hantavirus Infection: Hantavirus occurs mainly among the wild rodent populations in certain portions of the world. Rats and mice have been implicated in outbreaks of the disease. A Hantavirus 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: There are several other bacterial diseases that are possibly, though rarely spread through working with laboratory rodents. These include *yersinia* and *tularaemia.*

Allergic Reactions to Rodents

By far the greatest occupational risk to working with rodents is allergic reaction or developing allergies. Those workers that have other allergies are at greater risk. Animal or animal products such as 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.** The single most effective preventatives measure that can be taken is thorough, regular hand washing. Wash hands and arms after handling any animal. Never smoke, drink or eat in the animal rooms or before washing your hands.
- **Wear gloves.** When working with rodents wear appropriate gloves for the task and wash your hands after removing gloves.
- **Wear respiratory protection.** Respiratory protection should be worn when there is a risk of aerosol transmission of a zoonotic agent or when there is a medical history of allergies. Information can be obtained by contacting EH&S (ehs@ucsc.edu) or visiting the Respiratory Protection Program website (http://ehs.ucsc.edu/programs/safety-ih/respiratory-protection.html).
- **Wear other protective clothing.** Lab coats should be available and worn when working with rodents. Avoid wearing street clothes while working with animals. Lab coats should be laundered at work.
- **Seek Medical Attention Promptly.** If you are injured on the job, promptly report the accident to your supervisor, even if it seems relatively minor. Minor cuts and abrasions should be immediately cleansed with antibacterial soap and then protected from exposure to rats and mice. For questions contact EH&S Biosafety (biosafety@ucsc.edu). For more serious injuries or emergencies, seek medical attention at Dominican Hospital.
- **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 and would not normally be suspected. Your physician needs this information to make an accurate diagnosis. Questions regarding personal human health should be answered by your physician.