

Laboratory Rodents

The following document describes common types of zoonotic illnesses encountered when working with the indicated species. This is not an exhaustive list and the possibility of zoonotic disease should be considered every time work is conducted with animals. Specific-pathogen-free status in laboratory animals tests only for the presence of particular pathogens and is NOT an assurance that the animal is pathogen-free or that it cannot transmit zoonotic diseases. PPE and experimental practices appropriate to the specific task should be followed when working with any animal species. EHS recommendations are made during review of your IACUC protocol –additional questions about the potential for zoonotic disease exposure should be directed to your EHS representative.

If you have had an exposure and/or are showing symptoms of illness, and need medical attention refer to the information in the [University of Michigan's Bite Scratch Protocol](#)

Bacterial

Disease:	TETANUS
Description of Disease:	Tetanus (lockjaw) is an acute, often fatal disease caused by the toxin of the tetanus bacillus, <i>Clostridium tetani</i> . The bacterium usually enters the body in the spore form, often through a puncture wound contaminated with soil, dust, or animal feces, or through lacerations, burns, and minor unnoticed wounds.
Symptoms in Animals:	The organism is commonly found in the intestines of animals where it causes no negative effects.
Transmission and Symptoms in Humans:	Humans infected through a wound or lesion frequently develop muscle rigidity and painful muscular contractions. Infection may be fatal.
Prevention:	All employees working with animals should be immunized against tetanus at least every ten years. All animal bite or scratch wounds should be thoroughly cleansed and evaluated by a physician.

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Additional Information:	https://www.cdc.gov/tetanus/index.html
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Disease:	RAT BITE FEVER
Description of Disease:	Rat bite fever can be caused by either of two Gram-negative pleomorphic bacilli bacteria: <i>Streptobacillus moniliformis</i> and <i>Spirillum minus</i> . <i>Spirillum minus</i> is rarely found in the United States and is more frequently isolated in Asia and Africa. These bacteria may be present in the oral and respiratory tracts of many rodents, including rats, mice, and gerbils. However, it is believed that few animals raised for use in research are infected with these agents.
Symptoms in Animals:	In mice, infection with <i>S. moniliformis</i> typically begins with acute disease consisting of dull, damp hair coats and keratoconjunctivitis. Chronically, mice display variable signs including cutaneous ulceration, arthritis, and gangrenous amputation. Rats do not usually develop any clinical signs of infection.
Transmission and Symptoms in Humans:	In a laboratory setting, the bite of an infected rodent is the usual source of infection. However, transmission may occur secondary to handling an infected animal or contaminated equipment and may not require a bite injury. Infected humans may experience fever, chills, lymphadenopathy (swollen lymph nodes), vomiting, painful and enlarged joints and a rash on the hands or feet. Symptoms usually occur 2-10 days after exposure. If left untreated, it can lead to pneumonia, inflammation of the liver or intestines, and endocarditis (inflammation of the lining of the heart) with a 10% fatality rate.
Prevention:	Preventative measures include proper handling and restraint of rodents to decrease the likelihood of animal bites, use of appropriate person protective equipment (such as gloves and gowns), and the prompt treatment and reporting of rodent bite wounds.

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Additional Information:	https://www.cdc.gov/rat-bite-fever/index.html
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Viral

Disease:	HANTAVIRAL DISEASES
Description of Disease:	Hantaviral diseases are found in wild rodents, including mice and rats. The diseases can be induced by numerous viruses within the viral family, Bunyaviridae. Rodents bred and raised for use in research are extremely unlikely to harbor Hantaviral disease.
Symptoms in Animals:	Infected animals most frequently do not develop any signs of illness.
Transmission and Treatment in Humans:	Transmission to humans is by inhalation, wound contamination, conjunctival exposure, or ingestion of the virus shed in rodent urine, feces, and saliva. Brief exposure times as short as 5 minutes have resulted in human infection. In the US, infected humans may develop acute fever, back pain, and respiratory distress lasting from days to months. The disease may be fatal in humans.
Prevention:	Hantavirus infections can be prevented through screening of rodents and rodent tissues prior to introduction into resident laboratory animal populations and facilities. Good hygiene, disinfection of contaminated areas, and prevention of wild rodent entry into animal facilities are important in preventing spread of the virus.
Additional information:	http://www.cdc.gov/ncidod/diseases/hanta/hps/index.htm

Disease:	LYMPHOCYTIC CHORIOMENINGITIS (hamster, mice)
Description of Disease:	Lymphocytic choriomeningitis virus (LCM) is an arenavirus that can infect many rodent species used in research including mice, rats, hamsters, and guinea pigs. However, infection is highly unlikely in animals specifically bred and raised for use in research but must be considered for all rodents captured from the wild. Rodents, especially hamsters and mice, are the animal species most frequently implicated in disease transmission to humans. Exposure to infected rodent cell lines

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	have also been linked to human disease.
Symptoms in Animals:	LCM virus is well adapted to the mouse and infection is typically asymptomatic with lifelong virus shedding. Hamsters infected early in life may fail to thrive and show growth retardation, weakness, conjunctivitis, dehydration, and/or tremors. The LCM virus may be carried and excreted in the blood, cerebrospinal fluid, urine, saliva, secretions, urine, and feces of infected animals.
Transmission and Symptoms in Humans:	Humans can be infected by contamination of skin wounds or mucous membranes with fluids from infected animals, equipment contaminated with infectious fluids, bite wounds, or inhalation of contaminated particles from bedding material or other fomites. Airborne transmission is well documented. Humans may develop a flu-like illness up to 3 weeks following exposure and often recover without any complications or severe illness. However, meningitis (inflammation of the lining of the brain and spinal cord evidenced by severe headaches, neck stiffness, mental confusion and nausea), paralysis, and coma have been reported in severe cases. Severe disease may be fatal. The disease is diagnosed in humans through laboratory examination of the blood or cerebral spinal fluid.
Prevention:	Transmission of the virus can be prevented through use of appropriate personal protective equipment including gloves and protective clothing and through appropriate environmental sanitation. All rodents captured from the wild or obtained from non-research-related sources must be screened for evidence of this disease. Exclusion of wild rodents and elimination of ectoparasites and insect vectors should be part of an overall plan to prevent LCM virus infections in laboratory animal facilities.
Additional information:	https://www.cdc.gov/vhf/lcm/index.html

References

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