

# Reptile, Fish, Amphibians

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](#)**

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## Bacterial

<b>Disease:</b>	<b>AEROMONAS INFECTION</b>
<b>Description of Disease:</b>	<i>Aeromonas hydrophila</i> , found in fish, fresh and saltwater reptiles, and other animals, can produce heat-labile enterotoxins and cause gastroenteritis in humans, with chronic infection possible.
<b>Clinical Signs in Animals:</b>	<i>Aeromonas spp.</i> , along with other common bacteria, can cause hemorrhagic septicemia in fish and other aquatic animals, characterized by external reddening, and hemorrhage in the viscera, peritoneum, and body wall. <i>Aeromonas hydrophila</i> is one of the causes of “red leg disease” in frogs.
<b>Transmission and Symptoms in Humans:</b>	In the laboratory environment, <i>Aeromonas spp.</i> may be transmitted to humans through open wounds or through ingestion of contaminated water. Humans with compromised immune systems are most susceptible, Diarrhea can follow 1-2 days after oral transmission. Bacteremia can follow as early as 24 hours

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	after contamination of a wound, with cellulitis being the most common sign of soft tissue infection.
<b>Prevention:</b>	The practice of good personal hygiene, such as hand washing after handling animals and their environment, the use of personal protective equipment, and effective environmental sanitation (e.g. maintaining good water quality and promptly removing dead fish) are most important in preventing disease transmission to personnel.
<b>Additional Information:</b>	<a href="https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/aeromonas-hydrophila.html">https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/aeromonas-hydrophila.html</a>

<b>Disease:</b>	<b>MYCOBACTERIOSIS</b>
<b>Description of Disease:</b>	Mycobacteriosis is a chronic or acute, systemic, granulomatous disease in fish and some reptiles that can manifest as a cutaneous disease in infected human handlers. <i>Mycobacterium marinum</i> and <i>Mycobacterium fortuitum</i> are the most important causes of mycobacteriosis aquatic animals and humans.
<b>Clinical Signs in Animals:</b>	Fish of the family Cyprinidae, which includes the species <i>Danio rerio</i> (zebrafish), are thought to be particularly susceptible to <i>Mycobacterium</i> . The chronic form of the disease is most common. While some fish may show no external signs of disease, affected animals can be anorexic, emaciated, and lethargic. They may be found separate from other fish in the tank. Internal muscular lesions can rupture, causing nodular skin lesions, ulceration, or hemorrhage. Exophthalmos, abdominal distention, and skeletal deformities such as spinal curvature and stunting can also be seen. Gills can be pale

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	and cutaneous pigment can become faded. The rarer acute form of the disease will cause rapid morbidity and mortality with few clinical signs.
<b>Transmission and Symptoms in Humans:</b>	In the laboratory, transmission to humans can occur through entry of contaminated water sources or biological materials through breaks in the skin. Bites or punctures by fish fins can serve as sources of direct inoculation. Infection will usually manifest as a single or clusters of small erythematous papules that develop into granulomas, ulcers, or abscesses. Given the likely site of infection, these are usually found on the hands, but can migrate locally along the line of the lymphatics and can persist for months. Infections of deeper tissues are possible.
<b>Prevention:</b>	The practice of good personal hygiene, such as hand washing after handling animals and their environment, the use of personal protective equipment, and effective environmental sanitation are most important in preventing disease transmission to personnel.
<b>Additional Information:</b>	<a href="http://www.cfsph.iastate.edu/Factsheets/pdfs/mycobacterium_marinum.pdf">http://www.cfsph.iastate.edu/Factsheets/pdfs/mycobacterium_marinum.pdf</a>

<b>Disease:</b>	<b>SALMONELLOSIS</b>
<b>Description of Disease:</b>	<i>Salmonella</i> is a major global cause of diarrheal diseases. The serovars commonly found in reptiles that are considered highly pathogenic are <i>Salmonella enterica</i> spp. <i>enterica</i> and <i>Salmonella enterica</i> spp. <i>arizonae</i> .
<b>Clinical Signs in Animals:</b>	<i>Salmonella</i> is commonly found in healthy reptiles, fish, and amphibians and does not normally cause illness.

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<b>Transmission and Symptoms in Humans:</b>	In the laboratory environment, <i>Salmonella spp</i> may be transmitted to humans when a person ingests infected fecal material or has contact with fomites. Shedding of bacteria in feces increases during periods of stress such as during transportation or handling. Infected humans may have diarrhea (with or without blood), vomiting, fever, and stomach cramps. More severe signs and symptoms may develop especially in individuals with compromised immune systems. Onset of signs will usually occur 6 hours to 6 days after infection and last for 4-7 days.
<b>Prevention:</b>	The practice of good personal hygiene, such as hand washing after handling animals and their environment, the use of personal protective equipment, and effective environmental sanitation are most important in preventing disease transmission to personnel.
<b>Additional Information:</b>	<a href="https://www.cdc.gov/salmonella/">https://www.cdc.gov/salmonella/</a>

<b>Disease:</b>	<b>STREPTOCOCCOSIS</b>
<b>Description of Disease:</b>	Streptococcosis caused by <i>Streptococcus iniae</i> in fish is an emerging zoonotic disease and major fish pathogen in many parts of the world.
<b>Clinical Signs in Animals:</b>	<i>Streptococcus iniae</i> can cause high mortality in aquaculture and laboratory environments. Fish dying from streptococcal disease often move in a disoriented, whirling motion and will be found at the surface. Affected fish can also have small, red areas on their skin, exophthalmos, and swollen abdomens.
<b>Transmission and Symptoms</b>	In the laboratory, transmission to humans can occur through entry of contaminated water sources or biological materials through breaks in the skin. Individuals with bacteremia will present with fever and

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<b>in Humans:</b>	lymphangitis in addition to cellulitis in the hand or other area of inoculation. Many of the virulence factors in <i>S. iniae</i> are homologous to those found in <i>Streptococcus pyogenes</i> .
<b>Prevention:</b>	The practice of good personal hygiene, such as hand washing after handling animals and their environment, the use of personal protective equipment, and effective environmental sanitation are most important in preventing disease transmission to personnel.
<b>Additional Information:</b>	<a href="https://www.cdc.gov/healthypets/pets/fish.html">https://www.cdc.gov/healthypets/pets/fish.html</a>

<b>Disease:</b>	<b>TETANUS</b>
<b>Description of Disease:</b>	Tetanus (lockjaw) is an acute, often fatal disease caused by the toxin of the tetanus bacillus, <i>Clostridium tetani</i> .
<b>Clinical Signs in Animals:</b>	The organism is commonly found in the intestines of animals where it causes no negative effects.
<b>Transmission and Symptoms in Humans:</b>	The bacterium usually enters the body in the spore form, often through a bite or puncture wound contaminated with soil, dust, animal feces, or animal saliva, or through lacerations, burns, and minor unnoticed wounds. Humans infected through a wound or lesion frequently develop muscle rigidity and painful muscular contractions. Infection may be fatal.
<b>Prevention:</b>	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.
<b>Additional Information:</b>	<a href="https://www.cdc.gov/tetanus/index.html">https://www.cdc.gov/tetanus/index.html</a>

## References

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CDC Fish <https://www.cdc.gov/healthypets/pets/fish.html>

CDC Reptiles and Amphibians <https://www.cdc.gov/healthypets/pets/reptiles.html>