

UCSC Biosafety - Information on Zoonotic Diseases

Species Specific Guide - Fish



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 fish.

Potential Zoonotic Diseases

Aside from food poisonings, the overall incidence of transmission of disease-producing agents from fish to humans is low. There are, however, a number of agents that are found in fish and aquarium water that have the potential to be transmitted to humans. In general, humans contract fish borne disease through ingestion of infected fish tissues or aquarium water or by contamination of lacerated or abraded skin. An important feature of many of the disease causing agents is their opportunistic nature. 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-risk for contracting a fish borne disease and should consult your physician. The following is a list of known and potential fish borne zoonoses.

Mycobacterium: Organisms in the genus *Mycobacterium* are non-motile, acid-fast rods. Two species, *M. fortuitum* and *M. marinum*, are recognized as pathogens of tropical fish. Humans are typically infected by contamination of lacerated or abraded skin with aquarium water or fish contact. A localized granulomatous nodule (hard bump) may form at the site of infection, most commonly on hands or fingers. The granulomas usually appear approximately 6-8 weeks after exposure to the organism. They initially appear as reddish bumps (papules) that slowly enlarge into purplish nodules. The infection can spread to nearby lymph nodes. More disseminated forms of the disease are likely in immunocompromised individuals. It is possible for these species of mycobacterium to cause some degree of positive reaction to the tuberculin skin test.

Aeromonas spp.: Aeromonad organisms are facultative anaerobic, gram-negative rods. These organisms can produce septicemia (a severe generalized illness) in infected fish. The species most commonly isolated is *A. hydrophilia*. It is found world wide in tropical fresh water and is considered part of the normal intestinal microflora of healthy fish. Humans infected with *Aeromonas* may show a variety of clinical signs, but the two most common syndromes are gastroenteritis (nausea, vomiting and diarrhea) and localized wound infections. Again, infections are more common and serious in the immunocompromised individual.

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Other Bacteria and Protozoa

Below is a list of additional zoonotic organisms that have been documented in fish or aquarium water. Human infections are typically acquired through ingestion of contaminated water (resulting in gastroenteritis symptoms) or from wound contamination.

Gram-negative Organisms: *Plesiomonas shigelloides*, *Pseudomonas fluorescens*, *Escherichia coli*, *Salmonella spp.*, *Klebsiella spp.*, *Edwardsiella tarda*

Gram-positive Organisms: *Streptococcus*, *Staphylococcus*, *Clostridium*, *Erysipelothrix*, *Nocardia*

Protozoa: *Cryptosporidium*

Allergic Reactions to Fish

Human sensitivity to fish proteins in the laboratory setting is rare. It remains possible, however, to become sensitized to fish proteins through inhalation or skin contact.

How to Protect Yourself

- **Wash your hands.** The single most effective preventative measure that can be taken is thorough, regular hand washing. Wash hands and arms after handling fish and aquarium water. Never smoke, drink or eat in the animal rooms or before washing your hands.
- **Wear gloves.** If you are in a situation in which you will spend a significant amount of time with your hands immersed in water or if you have any cuts or abrasions on your hands or arms, you should wear sturdy, impervious gloves.
- **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 fish and aquarium water. If there are any questions, contact EH&S Biosafety (biosafety@ucsc.edu). For serious injuries, seek medical attention at Dominican Hospital.
- **Tell your physician you work with fish.** 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 fish. 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.