

**Occupational Health for Animal Handling****Care and Use of Zebrafish**

The Occupational Health and Safety Program is designed to inform individuals who work with animals about potential zoonosis (disease 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 zebrafish (*Danio rerio*).

**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 fishborne disease through ingestion of infected fish tissues or aquarium water, or by contamination of lacerated or abraded skin. An important feature of many bacterial and protozoal organisms 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 fishborne disease and should consult your physician. The following is a list of known and potential fishborne zoonoses.

**Mycobacterium** Organisms in the genus *Mycobacterium* are nonmotile, 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 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 in infected fish. The species most commonly isolated is *A. hydrophilia*. It is found worldwide 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 and localized wound infections. Again, infections are more common and serious in the immunocompromised individual.

**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 Zebrafish**

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. For more serious injuries or if there is any question, students should report to OSU Student Health Services, employees (faculty and staff) to the Corvallis Clinic Occupational Health department.
- 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.