

## **Working Safely with Fish: Preventing Injury and Zoonotic Disease Transmission**

The VSU IACUC occupational health and safety program is designed to inform individuals who work with animals about potential zoonoses (diseases transmitted to humans from animals), personal hygiene to prevent zoonotic transmission, and other potential hazards associated with animal exposure. This information sheet is directed toward those involved in the care and use of fish, including aquarium fish.

### **Injuries from Handling Fish**

People can receive cuts, scratches, or puncture wounds when handling the fins of some fish species. Infectious organisms from the fish or their tank water can enter skin wounds of handlers and may establish an infection. It is essential that people who handle fish for research or teaching be provided with training in proper handling techniques to avoid injury to themselves or the animals, such as specific handling and restraint techniques and protective clothing requirements.

### **Potential Zoonotic Diseases**

Aside from food poisonings, the overall incidence of transmission of disease producing agents from fish to humans is low. There are 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 diseases 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 a human host often requires a preexisting state in which the immune system is compromised. If you have an immune-compromising medical condition (e.g., AIDS/HIV positive or have had the spleen removed) or you are taking medications that impair your immune system (e.g., steroids, immunosuppressive drugs, or chemotherapy), you are at risk for contracting a fish borne disease and should consult your health care provider.

There are a number of zoonotic diseases associated with care and handling of fish. Some of those diseases may not produce easily observable signs of illness in fish; therefore, if you handle fish or their tank water you must take appropriate precautions to prevent transmission of these diseases. Zoonotic diseases that fish may carry include:

**Mycobacterium:** Organisms from 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 six to eight 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. Other diseases (disseminated respiratory disease, lymphadenitis, arthritis, osteomyelitis, and/or tenosynovitis) 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.

**Salmonella:** Salmonellosis is a bacterial disease caused by the bacterium *Salmonella*. Many different kinds of *Salmonella* can make people sick. Most people have diarrhea, fever, and stomach pain that start one to three days after they get infected. These symptoms usually go away after one week. Sometimes, people have to see a doctor or go to the hospital because the diarrhea is severe or the infection has affected their organs. Animals can carry *Salmonella* and pass it in their feces. People get salmonellosis if they do not wash their hands after touching the feces of animals.

**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 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 (nausea, vomiting, and diarrhea) and localized wound infections. Again, infections are more common and serious in the immunocompromised individual.

**Other diseases:** Other diseases that can be spread through working with fish are *Plesiomonas spp.*, *Pseudomonas fluorescens*, *E. coli*, *Klebsiella spp.*, *Edwardsiella tarda*, *Streptococcus spp.*, *Staphylococcus spp.*, *Clostridium spp.*, *Erysipelothrix spp.*, *Nocardia spp.*, and *Cryptosporidium* through the ingestion of contaminated water. For information about signs and symptoms of illness or disease in fish and humans, see [Zoonoses of Fish, Amphibians and Reptiles](#).

## **Allergic Reactions to Fish**

In the laboratory setting, human sensitivity to fish allergens (proteins which causes an allergic reaction in people) is rare. However, some people do become sensitized to fish proteins through inhalation or skin contact.

## **How to Protect Yourself**

**Wash your Hands:** The single most effective preventative measure that you can take is thorough, regular hand washing. You must wash your hands and arms after handling fish or contaminated water or tanks. Proper technique involves the following steps:

- Wet your hands with clean running water (warm or cold) and apply soap.
- Rub your hands together to make a lather and scrub them well; be sure to scrub the backs of your hands, between your fingers, under your nails, and up your forearms.
- Continue rubbing your hands and arms for at least twenty seconds (the time it takes to sing the "Happy Birthday" song from beginning to end twice).
- Rinse your hands and arms well under running water.
- Dry your hands and arms using a clean towel or air dry.

Washing hands with soap and water is the best way to reduce the number of germs on them. If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol. Alcohol-based hand sanitizers can quickly reduce the number of germs on hands in some situations, but sanitizers do **not** eliminate all types of germs. To use hand sanitizer effectively:

- Apply the product to the palm of one hand (read the label to learn the correct amount).

- Rub your hands together.
- Rub the product over all surfaces of your hands and fingers and up your forearms until they are dry.

Note that hand sanitizers may not be as effective when hands are visibly dirty.

**Wear Personal Protective Equipment (PPE):** Wear eye and respiratory protection when appropriate. Wear gloves and/or protective sleeves when handling aquarium water, animals, animal tissues, body fluids, and waste. If you spend a significant amount of time with your hands immersed in water or if you have any cuts and abrasions on your hands or arms, wear sturdy, water-proof gloves of sufficient length to prevent water from entering the gloves at the cuff. Wear dedicated protective clothing such as a water-proof coat or apron when handling animals. Launder the soiled clothing separate from your personal clothes. When in the field, change clothing as soon as possible after exposure to fish and aquatic/marine habitats.

**Practice Good Hygiene:** Cover abraded skin, cuts, scrapes or sores and do not allow wound contact with fish, fish-contaminated materials or aquarium water. Avoid touching your face, eyes, nose, or mouth with unwashed hands or contaminated gloves. Never eat, drink, use tobacco products, or apply makeup in animal facilities or while handling animals.

**Maintain the Work Environment:** Keep animal areas clean and disinfect equipment after using it on animals or in animal areas. Use cleaning techniques that do not aerosolize dirty water or other materials.

**Seek Medical Attention Promptly:** If you are injured on the job while handling fish or contaminated water, tanks, or other equipment, promptly report the accident to your supervisor, even if it seems relatively minor. Clean any minor cut or abrasion immediately with antibacterial soap, and protect it from dirt and animal secretions until it has healed. Seek medical assessment and referral for treatment for more serious injuries or if you have an infected wound indicated by swelling, redness, pain, and draining fluids with or without a fever.

**Tell Your Health Care Provider You Work with Fish:** Familiarize yourself about the animals that you will be working with and the potential zoonotic diseases associated with each species. If you are ill, even if you are not certain that the illness is work related, always mention to your health care provider that you work with fish. Many zoonotic diseases have flu-like symptoms and would not normally be suspected. Your health care provider needs this information to make an accurate diagnosis. Questions about personal human health should be answered by your health care provider.