BACKGROUND

This document provides information about potential zoonotic exposure while working with or exposed to wild mammals or their products (e.g., fecal sample). The infectious agents listed here are not all inclusive, but provide the most common zoonotic agents seen in wild mammals. The safe work practices are provided as suggestions for staff and researchers who work with animals, in animal facilities, or with animal products.

ZOONOTIC PATHOGENS

Zoonotic diseases of concern include by are not limited to the following:

1. Rabies
   a. Organisms: Rabies virus
   b. Clinical Signs
      i. Animals - depression or aggression, generalized neurological signs
      ii. Humans - local pain at site of inoculation; headache, malaise, fever; anxiety, agitation, paralysis, coma, death.
   c. Transmission: Saliva (via bites or open wounds), aerosolization in certain circumstances (e.g., within bat caves), contamination of mucous membranes with saliva or central nervous system tissue.

2. Leptospirosis
   b. Clinical Signs
      i. Animals - Asymptomatic to decreased weight gain, anorexia, abortion, fever, diarrhea, and generalized neurological signs.
      ii. Humans - Flu-like symptoms (fever, chills, headache, muscle ache, vomiting); liver and kidney failure.
   c. Transmission: Ingestion, direct abraded skin, or mucous membrane contact with contaminated water, urine, aborted fetus, or vaginal discharge from infected animals; aerosolization can occur.

3. Gastrointestinal Infection
   a. Organisms: *E. coli*, *Salmonella spp.*, *Cryptosporidium spp.*, *Giardia spp.*, *Yersinia spp.*
   b. Clinical Signs
      i. Animals – Asymptomatic or Diarrhea.
      ii. Humans – Nausea, vomiting, diarrhea, abdominal pain.
c. Transmission: Fecal-oral route; handling contaminated objects; contact with contaminated surfaces.

4. Tularemia
   a. Organisms: *Francisella tularensis*
   b. Clinical Signs
      i. Animals – most commonly affects rabbits, hares, and rodents; fever, lethargy, weight loss.
      ii. Humans – flu-like symptoms (fever, chills, muscle aches, etc), conjunctivitis or swelling on skin, weight loss.
   c. Transmission: Direct skin or mucosal contact with infected animals or tissues (also bites from infected insects, accidental inhalation of contaminated dust).

5. Tuberculosis
   b. Clinical Signs
      i. Animals – chronic lethargy, cough, weight loss.
      ii. Humans – asymptomatic, cough, difficulty breathing, lethargy, fever, weight loss.
   c. Transmission: Inhalation of the organism within aerosolized droplets

6. Dermatophytosis (Ringworm)
   a. Organisms: *Microsporum nanum*, *Microsporum canis*, *Trichophyton mentagrophytes* and *T. verrucosum*
   b. Clinical Signs
      i. Animals - Crusty, dark, hairless patches; common on the skin around the head and neck; thorax, flank, behind the ears, on the legs.
      ii. Humans - Local itching; red or scaly patch of skin, often with central clearing; may have areas of hair loss.
   c. Transmission: Direct contact with skin lesions of infected animal. Can also be contracted via contaminated equipments and environmental objects.

7. Other field-associated disease risks
   a. Arthropod-borne infections (e.g., encephalitis, Lyme disease, tularemia, erlichiosis):
      Infectious agents may be mechanically transmitted through bites by arthropods (e.g., fleas, mosquitoes, midges, sandflies, mites)
   b. Helminth infections (e.g., tapeworms, larval migrans):
      Accidental ingestion of ova by fecal-oral route; handling contaminated objects; contact with contaminated surfaces.
   c. Fungal infections (e.g., Histoplasmosis, Coccidiosis) – Accidental inhalation of fungal spores within the environment, especially soil contaminated with bird and bat feces

**SAFE WORK PRACTICES**

1. Good Personal Hygiene
   a. Practice good personal hygiene.
      i. Avoid contact of mucous membranes with contaminated hands or materials.
      ii. Wash hands thoroughly with soap and water as soon as feasible (substitute alcohol-based disinfectants if water is unavailable- if hands are soiled, use “baby wipes” or similar material to remove dirt before using a sanitizer).
   b. Do not eat, drink, or use tobacco products in animal facilities.

2. Personal Protective Equipment
a. Follow any recommendations addressed by URI’s IACUC and URI EHS for project-specific PPE requirements.
b. Don proper PPE (e.g., gloves) before beginning the fieldwork.
c. Use protective equipment for direct handling of any animal that presents a significant health risk to the handler because of the potential risks from the animal (e.g. protective leather gloves for fractious or aggressive animals, snake-proof chaps or leggings in regions with high venomous snake concentrations).
d. Utilize greater levels of PPE when there is a higher potential of exposure to zoonotic agents. For example, use mucous membrane protection (e.g., safety glasses, face mask) when there is a risk for fluid contact with eyes, nose, or mouth or respiratory protection (e.g., N95 mask) when there is a risk of inhalation.
   i. Prior to using a respiratory protection device, the user must be enrolled in the University respiratory protection program. See URI’s EHS website for more information.

3. Animal Care
   a. Conducting animal work in the field setting presents unique safety hazards, review safety guidelines for field work with URI EH&S.
   b. When in the field, assure that emergency contact information and method of contact are close at hand.
   c. In the Kingston area, emergency veterinary care is available at all times including after working hours and on weekends and holidays (Vet phone: 401-742-2855).

4. Cleaning and Disinfecting
   a. Spray all potentially contaminated materials such as feces, urine, bedding with a 1:10 dilution of bleach or other suitable disinfectant. Avoid stirring up dry, dusty materials, thus minimizing the generation of potentially hazardous aerosol particles.
   b. After rodent use, disinfect traps by submerging in 1:10 dilution of bleach or other suitable disinfectant for 15 to 30 minutes. Rinse with water and let dry in the sun. If traps cannot be disinfected in the field, place in plastic bag for transport to an appropriate location. Disinfectant (e.g., 1:10 dilution of household bleach, 70% alcohol,) and method of application (e.g., sprayer or dunk tank).

5. Transporting live animals back to campus.
   a. An approved IACUC protocol is required before transporting live animals.
   b. Avoid contamination of the passenger compartment of vehicles.
   c. Use appropriate respiratory and personal protective equipment when performing these tasks.

6. Medical Attention
   a. Students: Contact URI Health Services (874-4763) for medical evaluation if you suspect any exposure, or if you develop any symptoms associated with infection with zoonotic agents (e.g., fever, malaise, diarrhea, abdominal pain). Alternatively, see your own personal health care provider if any injury or potential exposure to a zoonotic agent occurs.
   b. Employees: Contact URI Environmental Health and Safety if you suspect any exposure, or if you develop any symptoms associated with infection with zoonotic agents (e.g., fever, malaise, diarrhea, abdominal pain). Alternatively, see your own personal health care provider if any injury or potential exposure to a zoonotic agent occurs.
c. Notify the principal investigator or supervisor AND URI Environmental Health and Safety by completing an accident and injury report, 
http://www.uri.edu/publicsafety/EHS_incident_reporting_form.html

REFERENCES

