Occupational Health and Zoonotic Concerns When Using Laboratory Animals or Tissues

The Occupational Health Program for Personnel Caring For or Using Laboratory Animals and Animal Tissues/Fluids (hereafter referred to as "Program") consists of education, including information on diseases transmitted between human beings and animals, baseline and periodic medical evaluations, and provisions for treating illness or injury. The Program is designed to protect both personnel and laboratory animals. The principal concern is to protect personnel from and monitor exposure to hazards associated with laboratory animals (i.e. infectious diseases, traumatic wounds including bites, scratches and punctures, and allergies). The specific elements of the Program vary depending on the nature and extent of an employee's exposure to animals.

This document is intended to give employees an overview of the Program, as well as some information on hazards associated with laboratory animals and their tissues. Employees wanting specific and/or additional information about risks present in their work environment (and how to protect themselves from those risks) should contact their immediate supervisor. Additional resources for zoonotic diseases are the Medical Center Employee Health Services (EHS), Infection Control, and various sites on the Internet.

GENERAL INFORMATION AND PROCEDURES

A. Baseline (pre-placement) Assessments

Due to the potentially serious nature of some diseases carried or transmitted by laboratory animals, employees working with animals must have an Employee Health Services pre-placement evaluation and be enrolled in the Occupational Health Program. As described below, this involves surveillance for tuberculosis, tetanus, measles, mumps, rubella, varicella and allergies.

B. Tuberculosis Surveillance

All personnel having animal contact or working in areas where they are housed must have documentation of a negative tuberculin skin test (TST), a negative IGRA blood test or a normal chest radiograph from a physician. As recommended by the Centers for Disease Control and Prevention (CDC), current standard practice for tuberculin testing requires an IGRA blood test or an initial two-step test, administered by an appropriate health care professional, using the PPD (Purified Protein Derivative/Mantoux) method. The first TST is administered but does not need to be read by the health care provider unless the testing area becomes red or swollen/indurated within 48 to 72 hours. This test is followed by a second TST, administered at least 7 days later. The second test is considered to be the booster and should be read by the health care provider within 48 to 72 hours. Tuberculin skin tests/IGRA blood tests must be repeated at 6-month intervals for those working in nonhuman primate areas and at 12-month intervals for other areas. Employees who have been vaccinated against tuberculosis (BCG or other vaccine) will be tested using the IGRA blood tests.

Any individual with a positive skin test or IGRA will be referred to the Medical Center Employee and Occupational Health Services for further evaluation. Any employee known to have a positive skin test reaction in the past will be questioned as to whether they have ever been evaluated or treated for their positive test, if not an IGRA blood test will be drawn to confirm. That history will be documented in their medical record and they will be followed henceforth as per

current CDC guidelines and the Medical Center TB Policy. Evaluation of an employee with a recent conversion to positive may include chest radiographs and labwork. Individuals with normal chest films will be offered a prescription for preventive treatment (e.g., isoniazid; INH) to reduce the probability of converting from latent to active TB. Employees whose chest films demonstrate abnormalities compatible with pulmonary tuberculosis will be evaluated further by a physician to rule out current disease. Any person with current/active disease will be referred for treatment and not allowed in animal facilities until cleared by Employee Health Services.

Anyone who is TST or IGRA positive will be evaluated by Medical Center Employee Health Services for TB status with recommendations made for treatment and follow-up in keeping with CDC guidelines and the Medical Center TB Policy. A baseline chest X-ray will be required for all newly identified TST/IGRA-positive employees. The Medical Center Employee Health Services will also monitor asymptomatic, TST/IGRA-positive individuals with negative laboratory results.

The Employee Health Services also assesses tuberculosis surveillance for non-employees and students who will be entering animal areas. A two-step TST or IGRA is required for non-employees and students as well. If documentation is available of at least two previous TSTs, with the last test within the preceding 12 months, then only one test is needed within 6 months of the visit.

While TST testing is still acceptable, only IGRA testing will be available through Employee Health. Non-employees may be required to pay a fee for services provided by Employee Health.

C. Surveillance for Tetanus/Tetanus Immunization

Tetanus immunization has been and will continue to be required for all employees who cannot confirm immunization within the last ten years. Tetanus immunization data will be added to each employee's Health Surveillance Program (HSP) file; individuals will then be notified regarding future re-immunization.

D. Measles, Mumps, Rubella and Varicella

A measles, mumps, rubella and varicella screen will be performed on all new employees. A measles, mumps, rubella and varicella vaccine(s) will be given to all employees requiring vaccination.

E. Noninfectious, Job-Related Injuries

Persons with job-related injuries will be examined and managed by the staff of the Medical Center Employee Health Services. In the event of an injury, the employee must notify his/her supervisor or other designated person, so that arrangements may be made for the employee to be evaluated on a timely basis. When the Medical Center Employee Health Services is closed, or in an emergency situation, injured personnel will be taken to the Emergency Department of the Wake Forest Baptist Medical Center.

F. Allergies

Dander, serum, urine, and saliva are just some of the materials that can induce an allergic reaction in an animal handler who is sensitized to these animal products. Allergic responses generally are seen immediately after handling an animal, but may not appear for several hours after exposure. Sneezing, tearing, and red, swollen eyes are typical responses; however, a rash, wheal,

hives, or other type of skin inflammation also may be seen. Although there are few data regarding effective means for preventing allergies in animal handlers, it is thought that use of personal protective equipment (PPE) reduces exposure to animal allergens and thus, PPE are recommended in all animal areas. Persons with known allergies to animals should notify their supervisor and Medical Center Employee Health Services of their condition.

G. Pregnancy

It is possible that some diseases carried by animals could be transmitted to the fetus. Of particular concern are diseases that could be carried by cats (Toxoplasmosis), ruminants (Q fever), and primates. Therefore, it is recommended that pregnant women advise their supervisors of their condition and exercise caution when handling these species. Additionally, pregnant women should seek advice from their personal physician regarding any specific risks or concerns for their medical care and management.

INFORMATION REGARDING ZOONOTIC DISEASES

A zoonosis is a disease that may be transmitted from animals to human beings. Exposure to some of these diseases, such as diarrheal and parasitic diseases, could come from several different animal species. Some of these diseases are more specific to certain types of animals, such as toxoplasmosis in cats. An attempt has been made to highlight certain zoonotic diseases to which an employee could possibly be exposed in the course of employment. Persons with known compromised immune function may be more susceptible to certain zoonotic diseases and should notify their supervisor or Medical Center Employee Health Services of their condition. Also, individuals with certain diseases (such as tuberculosis or measles) may cause health consequences in animals and thus, should make their supervisors aware of potential diseases that may affect the animals.

A. Infectious diseases

Methicillin resistant *Staphylococcus aureus* and *S. intermedius* (MRSA and MRSI) bacteria are an emerging concern in zoonotic diseases. Both MRSA and MRSI have been isolated from animals, and pose a risk for humans. The risk is small, and the MRSA or MRSI infections in animals are rare, but the potential should be noted.

B. Nonhuman Primates

1. Tuberculosis (TB): TB is not usually a naturally occurring disease of monkeys. If, however, the monkeys contract the disease from people, they may transmit the disease to other monkeys or, possibly to people. While the transmission of TB from monkeys to people is rare, the transmission of TB from people to monkeys is well documented and poses a significant threat to any monkey colony. The disease is spread by inhalation or ingestion, which is minimized by wearing a mask and proper PPE. All Wake Forest University-housed monkeys are evaluated at least every 120 days, or more frequently, such as during initial acquisition, to detect monkeys with signs of TB. To further decrease the potential spread of this disease, monkeys with positive signs of TB, or those who test positive for TB are removed from the colony.

2. Herpes B-Virus: Herpes B-virus (*Macacine herpesvirus 1*, formerly *Cercopithecine Herpesvirus 1*) is carried by nonhuman primates of the genus *Macaca*. This genus includes rhesus, cynomolgus, bonnet, pigtail, and stumptail monkeys. Herpes B-virus typically causes mild to no

disease in these species, but can cause fatal encephalitis in human beings. The risk of transmission to human beings is very low with proper use of protective clothing (including eye protection) and with proper animal restraint. However, wounds by these species or from objects contaminated with blood, body fluids or tissues from these species require immediate medical attention, as do splashes of macaque body fluids into the eyes, nose, or mouth or an open wound.

In 2003, the CDC "B Virus Working Group" published updated recommendations for the prevention of and therapy for exposure to Herpes B virus (*Clinical Infectious Diseases* 2002; 35:1191-203). A web-based training program was then developed at Wake Forest University and employees with nonhuman primate contact are required to take this course annually. As described, the first few minutes is the most critical period for managing an injury involving possible exposure to Herpes B-virus. Thorough cleansing within 2 or 3 minutes following the injury/exposure is probably the only means of actually preventing infection. Consequently, "Monkey Bite/Wound Kits" are located in areas where nonhuman primates are housed or studied, and in the Wake Forest Baptist Medical Center ED. These kits contain the necessary supplies with instructions for attending to a macaque exposure. A wound should be scrubbed immediately with a concentrated soap (for example, Betadine™ scrub or chlorhexidine scrub) for at least 15 minutes. After the 15-minute period, the area should be rinsed with water to remove all traces of detergent. If eyes, nose, and/or mouth have been exposed, the site should be irrigated for at least 15 minutes with large amounts of sterile water, sterile saline solution, or rapidly flowing tap water.

The employee must report the injury to his/her supervisor and to the Animal Resources Program (ARP) veterinary staff immediately after wound care is completed. If the injury is a penetrating wound (skin broken) the employee will be sent to the Medical Center Employee Health Services for evaluation and treatment. Following potential exposure, the employee's appropriate medical intervention (i.e., examination, diagnostic workup, and treatment, if indicated) will be carried out by medical professionals of the Medical Center Employee Health Services. If the animal involved is identified, samples will be obtained from the animal by the ARP veterinary staff. Samples from both human and nonhuman primate subjects will be analyzed for the presence of Herpes B-virus or antibodies to the virus, either of which may indicate infection.

Signs and symptoms associated with B-virus infection in humans include:

- Early Manifestations (inconsistently present)
  - -vesicular eruptions (small blisters) or ulcerations near the exposure site
  - -severe pain or itching at the exposure site
  - -regional lymphadenopathy (swollen lymph glands)
- Intermediate Manifestations (inconsistently present)
  - -fever and chills
  - -numbness or paresthesia (mild tingling, numbness or paralysis) at or near the exposure site
  - -conjunctivitis
  - -persistent hiccups
- Late Manifestations (avoidable with early therapy)
  - -sinusitis
  - -neck stiffness
  - -headache > 24 hours
  - -nausea and vomiting
  - -altered mental status

-other signs compatible with central nervous system impairment or viral encephalitis, including urinary retention, hemiplegia, progressive ascending paralysis, or coma

If any of these signs or symptoms is observed, the employee should notify their supervisor immediately and report to Medical Center Employee Health Services or Emergency Department for evaluation.

3. Job-Related Injuries and Illnesses: For monkey bites and associated injuries (including scratches or wounds from needles, cages, or equipment that might be contaminated with monkey secretions) from macaque species, the precautions listed above for Herpes B-virus exposure should be started immediately. Following the recommended scrubbing-rinsing-swabbing-scrubbing-rinsing procedure for injuries from macaques or standard wound care from injuries from other animals, the employee must report the injury to his/her supervisor and the ARP veterinary staff immediately. If the wound is severe, the employee will immediately be taken to the Medical Center Employee Health Services or the Emergency Room at Wake Forest Baptist Medical Center.

4. Diarrheal and Parasitic Diseases: Since monkeys are similar to people, it is not surprising that they share many of the same diarrheal and parasitic diseases. The risk of contracting diarrheal diseases (*Shigellosis, Yersiniosis, Salmonellosis, Campylobacteriosis*) is decreased considerably if protective clothing is worn and proper hygiene is used (i.e., no eating, drinking, smoking, or applying cosmetics, including lipstick, in animal housing areas and thorough hand-washing after working with monkeys). Parasitic organisms (*Strongyloides*, *Entamoeba*, *Giardia,* and *Balantidium*) can also be passed from monkeys to people. Again, proper clothing and hygiene will greatly decrease the risk.

Note: If an employee contracts diarrhea and has recently worked with monkeys or monkey secretions or tissues, the employee should notify his/her supervisor. If warranted (diarrhea accompanied by fever or diarrhea of greater than 2-3 days duration), the employee should be sent to the Medical Center Employee Health Services for evaluation.

5. Miscellaneous Viral Diseases: Two viruses (Ebola virus and Marburg disease) known to infect monkeys can cause serious disease in people. To date, there have been no cases of either of these diseases among Wake Forest Baptist Medical Center monkeys or employees, and their incidence elsewhere is rare. A virus related to human Ebola virus was identified in nonhuman primates, but the virus does not appear to cause disease in humans. Nonetheless, the use of PPE, proper methods of animal restraint, and good personal hygiene will reduce the risk of exposure to these viruses.

6. Simian Immunodeficiency Virus (SIV) and Simian Foamy Virus (SFV): These are retroviral agents that may be found in the blood of many species of nonhuman primates. There have been reports of antibody conversion to both viruses (indicating infection) in a small number of people working with nonhuman primates. The potential for development of disease in people is unknown. These viruses should be considered potential zoonoses until proven otherwise. Standard precautions for preventing exposure to blood-borne pathogens should be observed.

7. Simian Type D Retrovirus (SRV): This virus causes immunodeficiency disease in macaque species (rhesus, cynomolgus, bonnet, pigtail, and stumptail monkeys). There is one report of SRV infection in a human AIDS patient. The contribution of SRV to the disease syndrome in the

HIV-infected person is undetermined. It is not known if SRV alone is capable of producing disease in healthy people. Until more is known, SRV, like SIV and SFV, should be considered a potential zoonosis, and standard precautions should be taken to prevent exposure to blood-borne pathogens.

8. Skin Diseases (Dermatomycoses): A skin disease known as ringworm can occur among people in all walks of life. Ringworm can be transmitted from animals to human beings. The risk of getting this disease from animals is decreased with the use of proper clothing and good hygiene (washing thoroughly after handling animals).

9. Rabies: Rabies can affect any warm-blooded animal. Although unlikely, it is always possible that a monkey may become infected before being imported or through contact with wild animals. Rabies virus is carried in saliva and can be transmitted through bites and scratches. The risk of transmission is decreased by wearing appropriate protective clothing and utilizing proper techniques for animal restraint.

10. Hepatitis Viruses: Hepatitis A virus, Hepatitis B virus, and Hepatitis E virus are three viruses that cause infection of the liver (hepatitis) in people. While the risk of contracting these diseases from monkeys is low (indeed, chances are much greater you will contract them from other people), precautions should be taken. Hepatitis A and E are transmitted orally; protective clothing and good sanitation practices will significantly reduce the risk of contracting this virus. Hepatitis B is transmitted via blood; careful handling of blood, needles and syringes is important in preventing transmission. Employees are encouraged to evaluate their level of risk of infection with their primary health care provider. Vaccination against Hepatitis B is available upon request; the cost of the vaccine will be absorbed by the employee's host department. There is no vaccine available for Hepatitis E virus.

11. Melioidosis: This disease is caused by the agent *Burkolderia pseudomallei* and occurs in human beings and animals in tropical and subtropical regions of the world. The disease has been found in a small number of macaques imported into the United States for use in research. Infection is generally acquired through contact of abraded skin with contaminated soil or water. Transmission of disease from animal to animal, animal to human, or human to animal is said not to occur. However, proper use of personal protective equipment when working with infected monkeys is recommended.

C. Cats

1. Toxoplasmosis: This is a common and widespread infection in many warm-blooded species, including human beings. It may be acquired in several ways, the most common of which is ingestion of the parasite in undercooked meat or unwashed garden vegetables. The role of the cat in the transmission of toxoplasmosis to people is also important. Domestic and wild cats are the only animals that shed the eggs of the parasite in their feces. Mature or sporulated eggs are infectious; and while the disease is mild in most cases (flu-like illness); it poses a serious threat to pregnant women and their fetuses, as well as immunocompromised individuals.

Employee Health Services recommends that serum-negative pregnant women and immunocompromised persons do not work around cats or cat litter pans. Such individuals should be referred to Employee Health Services for further evaluation. A supervisor should be notified if an employee is or may be pregnant, or if the employee's immune status is questionable so proper referral can be made. Proper hygiene (i.e., thorough washing of the hands with soap and water) and the use of PPE (gloves) will reduce the possibility of transmission of this organism from cats to people.

2. Diarrheal Diseases: Since cats are not closely related to people, fewer organisms are infectious to both species. There are some bacterial diseases (such as Campylobacteriosis) and parasitic diseases (such as roundworms) that can be infectious to both cats and people. Proper hygiene and PPE (gloves) greatly reduce the risk of contracting these diseases.

3. Rabies: The risk of rabies among our colony-housed cats is low, as these animals are vaccinated in accordance with standard veterinary practices and housed indoors, away from potentially infectious wild animals. Newly acquired cats are of greater risk and care should be taken when handling them. Rabies is usually transmitted through bites or contamination of open wounds or conjunctiva with infectious saliva. The risk of transmission is decreased by wearing appropriate PPE and utilizing proper techniques for animal restraint. Rabies prophylaxis is offered to any employee working with random-source cats and/or dogs. Rabies titers will be checked every two years. If titers fall below protective levels, a rabies vaccine booster will be administered.

4. Cat scratch disease (Bartonellosis) is a zoonotic infection characterized by a skin papule at the site of a cat scratch, followed by regional lymphadenitis (enlarged lymph nodes) and possible tendon or joint involvement. The disease in most cases is self-limiting, however, examination and treatment by a physician is recommended. The risk of transmission is decreased by utilizing proper techniques for animal restraint.

5. Ringworm, a fungal disease of the skin, is an infection in cats (and many other animals) that is readily transferable to people. Symptoms include itchy, red, raised scaly patches that may create the appearance of a ring. The use of protective clothing and good hygiene help prevent transmission of this disease.

D. Dogs

1. Rabies: Rabies is the principal health hazard of working with random-source dogs. The risk of rabies among USDA dealer-acquired “conditioned” (chronic) dogs is low, as these animals have been vaccinated and quarantined for a minimum of 21 days. Pound- and USDA dealer-acquired “acute” dogs, which have been held for shorter periods of time, represent a greater risk and care should be taken when handling these dogs. Rabies is usually transmitted through bites or contamination of open wounds or conjunctiva with infectious saliva. The risk of transmission is decreased by wearing appropriate clothing and utilizing proper techniques for animal restraint. Rabies prophylaxis is available to all personnel exposed to random-source dogs. Following pre-exposure vaccination, a blood sample will be collected every two years for antibody titer determination. Individuals with titers below a protective level will be offered a booster inoculation. Appropriate records of immunization, or rejection of the opportunity to receive immunization, will be kept as a part of the employee’s Health Surveillance Program (HSP) file.

2. Infectious Diseases: Dogs can also be a source of infectious diseases such as campylobacteriosis, leptospirosis, and brucellosis. The risk of contracting these diseases can be significantly reduced through the use of good hygienic practices and, when appropriate, protective clothing.

3. Parasitic Diseases: Parasites such as roundworms, some tapeworms, and sarcoptic mange are a potential risk to those handling infected animals. Again, good hygiene significantly reduces the risk of contracting these parasitic diseases.

E. Pigeons

1. Chlamydiosis (Psittacosis): The disease is transmitted through inhalation of organisms that may be found in birds or their excreta. The risk of infection is decreased through the use of protective clothing, particularly a mask.

2. Avian Tuberculosis is caused by a different type of mycobacterium than mammalian tuberculosis and is less likely to be infectious to people. However, it may be transmitted to people with immunosuppression or other concurrent diseases. Proper hygiene and use of masks decrease the risk of contracting this disease.

3. Fungal Diseases (Histoplasmosis, Cryptococcosis): There is some risk of fungal disease from pigeons, particularly if their pens are dusty. However, the risk is minimized with routine cleaning. The appropriate use of masks and good hygiene further reduce the risk.

4. Diarrheal Diseases: Some bacterial diseases (such as salmonellosis) can be transmitted to people from pigeons. The risk of such transmission is decreased by proper husbandry, good hygiene, and the use of appropriate protective clothing.

F. Rodents and Rabbits

Most of the rodent and rabbit colonies maintained by commercial suppliers and used in laboratories today are closely monitored for infectious diseases, thus minimizing the likelihood that laboratory workers will be exposed to infectious animals. All persons working with these species should be immunized against tetanus. Proper handling and restraint procedures will minimize the risk of animal bites and transmission of disease.

1. Lymphocytic Choriomeningitis Virus is a rodent virus found in the nervous tissue of infected animals. Hamsters and wild rodents are the major animal reservoirs of the virus, which is shed in urine and saliva. In people, the virus causes an acute flu-like illness and occasionally death. While most commercial vendors monitor their animals for the presence of this virus, care must be taken when handling wild rodents and rodents from sources that do not perform routine surveillance. Potentially infected materials, such as blood, bedding and transplantable tissues, should also be handled with care.

2. Allergies: Rodents and rabbits are commonly identified as a cause of allergies in people. Dander, serum, urine, and saliva are just some of the materials that can induce an allergic reaction in an animal handler who is sensitized to these animal products. Allergic responses

generally are seen immediately after handling an animal, but may not appear for several hours after exposure. Sneezing, tearing, and red, swollen eyes are typical responses; however, a rash, wheal, hives, or other type of skin inflammation also may be seen. Although there are few data regarding effective means for preventing allergies in animal handlers, it is thought that use of personal protective equipment (PPE) reduces exposure to animal allergens. Personnel with known or suspected allergies to animals should report their condition to their supervisor and Medical Center Employee Health Services.

3. Other Infections: Wild rodents are a common source of zoonotic infections in people. These animals may be sources of leptospirosis, bubonic plague, salmonellosis, and other bacterial and viral diseases, including Hantavirus Pulmonary Syndrome. Unless serologic surveillance of the animals indicates otherwise, special quarantine procedures should be used whenever handling or caring for wild rodents or animals of unknown health status.

G. Ruminants (Sheep, Cattle, Goats)

Q-Fever (*Coxiella burnetii*): Sheep and other ruminants are common hosts of this organism, which is found in high numbers in the birth fluids and placenta of pregnant animals. In human beings, the disease is most often characterized by flu-like symptoms with full recovery in 1-2 weeks. In a very small percentage of human cases, the infection may progress to chronic inflammation of the liver and/or heart unless treatment is administered. Humans are usually infected by inhalation of the organism. The organism is most prevalent in association with fetal tissues, placentas, recently delivered lambs, or ewes that are pregnant or recently have been pregnant. A program of medical surveillance has been established for employees who work with sheep. The program includes the provision of information on potential hazards of Q-fever infection, serological evaluation of personnel for *Coxiella burnetii* infection, and the use of PPE (disposable gowns, shoe covers, face mask, cap, and gloves) especially in areas where pregnant sheep are housed or used. Adherence to the program should reduce significantly the risk of contracting this disease.

H. Aquatic Species (e.g., Fish and Amphibians)

A number of bacterial, fungal and parasitic infections can be associated with aquatic species or contaminated water. ***Mycobacterium marinum*** can cause a condition know as 'fish-tank granuloma'. This bacterium can be contracted through direct contact of infected fish, puncture wounds, scratches and/or contaminated water/aquaria. **Aeromonas** is a bacterial disease that is associated with water that is soiled with excessive organic debris. **Salmonella** is a bacterial infection that is usually contracted through direct or indirect ingestion of the organism. Infection can occur via contact with animal feces, on animals or in the environment, or contact with contaminated food, water or objects (e.g., feeding bowls). Practicing good hygiene and wearing protective gloves and clothing can greatly reduce the risk of contracting these diseases.

I. Working with tissues from animals

Whereas caution should be exercised when working with all animal tissues, certain high risk species such as nonhuman primates, should be handled in a manner consistent with universal precautions described in OSHA Regulations (Standards – 29 CFR 1910.1030) for working with blood and bodily fluids. See:
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051
As described above, there are unique procedures and safety concerns surrounding the use of

macaque tissues, primarily because of concerns regarding the zoonotic *Cercopithecine Herpesvirus I* ("Herpes B") and with sheep tissue, primarily due to Q-Fever (*Coxiella burnetii*). Special care should be used when handling fresh or frozen tissues, as many pathogens will survive freezing. A lab coat, gloves, face mask, and full eye protection (face shield or goggles) must be worn. Waste tissue must be incinerated. Instruments or surfaces exposed to the tissues must be disinfected using methods approved for the control of tuberculosis and herpesviruses. Gloves must be removed when leaving the work area, and hands washed. There can be no smoking, eating, or application of cosmetics in any laboratory area where nonhuman primate tissues are handled. Working under an exhaust hood is recommended. Fixation should kill any infectious agents in the tissue; however, caution is recommended in handling even fixed tissues. If the tissues are formalin-fixed, a lab coat and gloves are required for handling them, and because of the cancer hazard associated with formaldehyde vapor, all work with fixed tissues should be done under a fume hood. A face shield or goggles should also be worn.

Occupational Health and Zoonotic Concerns When Using Laboratory Animals or Tissues

While not complete, this document identifies the zoonotic and infectious agents most likely to pose a health threat to employees, students, and visitors of the Wake Forest Baptist Medical Center. Persons working with or in close proximity to animals not covered in this summary should consult their supervisor regarding potential health hazards and appropriate precautions necessary to reduce the risk of animal-associated occupational injury or illness. These guidelines are to be followed by visitors, students, and house officers as well. As necessary, situations will be handled on a case-by-case basis in keeping with safety considerations and procedures for the humans and animals alike, and in keeping with the current regulatory requirements, e.g., CDC, OSHA, AAALAC, and TJC (The Joint Commission).

Please read this document thoroughly and ask any questions you may have. Your signature, witnessed by a supervisor and/or other designated individual, acknowledges that you have read the document and have had the opportunity to ask questions about its contents.

Employee Name (Print)	Signature	Date
Supervisor Name (Print)	Signature	Date

Document updated May 19, 2017

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5/19/17
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6-14-17
Date

Retain original in department and provide a copy to the employee/visitor.