

Occupational Health and Safety Program for Animal Handlers

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Applies To: Employees, Faculty, Students, Others

For More Information contact: EHS at 860-486-3613

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GLOSSARY OF TERMS

ACS	Animal Care Services
CDC	Centers for Disease Control and Prevention
DEEP	CT Department of Energy and Environmental Protection
DPH	CT Department of Public Health
EHS	Division of Environmental Health and Safety
EPA	U.S. Environmental Protection Agency
ESTA	Employee Safety Training Assessment
HBV	Hepatitis B Virus
IACUC	Institutional Animal Care and Use Committee
NIH	National Institutes of Health
NRC	U.S. Nuclear Regulatory Commission
OEM	UConn Health, Division of Occupational and Environmental Medicine (Farmington Health Center)
PHS	U.S. Public Health Service
PI	Principal Investigator
RCS	Research Compliance Services
SDS	Safety Data Sheet
SHS	Student Health Services
UConn	University of Connecticut Campuses, excluding the Farmington Health Center
WHA	Workplace Hazard Assessment

I. PROGRAM OVERVIEW

The University of Connecticut (UConn) Occupational Health and Safety Program for Animal Handlers (Program) covers all individuals who have occupational contact with animals in research and/or academic settings. The Program is available online at the Institutional Animal Care and Use Committee (IACUC) and the Division of Environmental Health and Safety (EHS) web sites*. **Animal contact includes, but is not limited to, the direct handling or manipulation of animals, alive or dead, transporting animals with or without cages, cage/stall cleaning or washing chores, animal facility custodial activities, and animal feeding or watering chores.** Personnel who engage in these activities are covered by this Program, and include Principal Investigators (PI) and their research staff, student employees or students named on protocols and animal care staff. Other University staff who frequent animal housing and come into contact with animals may be included in the program (e.g., University custodians, contracted janitorial employees, Facilities employees, etc.) **Isolated one-time animal contact may not require participation in the program. The program requirements are based on the type and frequency of exposure to animals.**

At UConn, the Division of Environmental Health and Safety (EHS) and the Institutional Animal Care and Use Committee (IACUC) jointly administer this program and are responsible for its enforcement. Research Compliance Services (RCS) participates with EHS in the periodic review and approval of the Program. EHS provides program oversight, while direct patient care is provided by a combination of internal and external Occupational Health providers and UConn Student Health Services (SHS).

The National Research Council's Guide for the Care and Use of Animals states that, "An occupational health program is mandatory for personnel who work in laboratory animal facilities or have substantial animal contact." **It is the responsibility of each supervisor to inform all workers under his/her supervision (co-investigators, staff, student employees, and volunteers) who have animal contact of the potential dangers involved, and are aware of the provisions of this Program.**

The Program includes occupational health services where animal handlers can receive appropriate counseling about the availability of pre-exposure vaccines, undergo routine testing as appropriate, and receive treatment for exposure to animal allergens, bites, scratches, etc.

The Program covers individuals who have animal contact and are listed on animal research/teaching protocols conducted by UConn PIs. At each annual protocol renewal, PIs must certify in writing that, to the best of their knowledge, all animal handlers working under that protocol are in compliance with the provisions of this Program.

Students (both undergraduate and graduate) who are not employees and have animal contact as part of a classroom experience are not covered by this Program, however they receive training by their instructor per the **IACUC Policy # SI-04-2010: Students Registered in Classes or Programs Described in Protocols**. This document can be found at the Research Compliance/IACUC web site: <http://research.uconn.edu/iacuc/iacuc-policies/>. Students may also find it helpful to review this Program as a guide to the hazards they may encounter with animal handling done during class.

Undergraduate students taking part in an independent study for credit that involves animal contact are also considered to be taking part as a class activity and are not covered by this program. The sponsoring instructor is responsible for providing the necessary safety training and can refer to this program as a guide. The student is responsible for any required immunizations as part of the class requirement. Due to the one-on-one nature of independent studies, students working with animals are required to register their animal exposure by filling out Form E - Personal Profile for Independent Study Students found at: <http://media.ehs.uconn.edu/Biological/AnimalHandlersPersonnelFormsFormsABCD.pdf>. Both student and sponsoring instructor must sign the form and submit the completed form to EHS.

This Program is intended to provide information to individuals having exposure to research and teaching animals, and includes both medical monitoring and educational components. Medical monitoring is

based on the type and frequency of exposure to animals, and may consist of a baseline health assessment, follow-up health assessment, diagnostic tests, and immunizations, which are part of the University's Medical Monitoring and Screening Program. The educational section provides individuals with specific health information and promotes safe work practices. It also includes the procedure for reporting an injury, and identifies resources for further information.

II. GENERAL PROGRAM INSTRUCTIONS

These instructions describe the steps that must be completed by PIs and all animal handlers to successfully fulfill the requirements of the Program. **No animals will be used by the PI or ordered by ACS until IACUC has approved the new protocol. Approval of protocols due for annual renewal is conditional upon the completion of Form A and annual updates. Failure to comply with other provisions of this Program may also affect IACUC approval of a protocol or your ability to work with animals under a protocol.**

INSTRUCTIONS FOR PRINCIPAL INVESTIGATORS

- Read this Occupational Health and Safety Program for Animal Handlers and ensure that you understand the various requirements and provisions. Additional health and safety-related information can be found at the EHS web page: <http://www.ehs.uconn.edu>.
- Make sure all animal handlers working in your laboratory under your protocol read this Occupational Health and Safety Program for Animal Handlers. Maintain a copy or provide access to this Program in your laboratory. The Program is on-line at the following EHS link: <https://ehs.uconn.edu/biological-health-and-safety/>.
- Personnel Forms:
(all can be found at the EHS web site under Forms, Biological Health and Safety <http://media.ehs.uconn.edu/Biological/AnimalHandlersPersonnelFormsFormsABCD.pdf>)
 - ❑ **Form A – Personal Profile** – make sure all animal handlers, including PIs, complete and sign a Personal Profile. The completed forms are sent to EHS (Unit 4097) and will be updated yearly (maintain a copy for your records). EHS will track these forms and inform you when you need to update your records. Form A helps determine a personal risk assessment, as well as documents your awareness of the Occupational Health and Safety Program for Animal Handlers. The second page of Form A is used to decline optional parts of the program.
 - ❑ **Form B – Confidential Personal Health History** – this optional form is for all animal handlers including the PI. All employees (non-student) who choose to fill out this form should send to EHS, U-4097 Attn: Occ Med Review and mark as “confidential”. The forms will be forwarded for Occupational Health review with supporting documentation. For student animal handlers named to protocols or student employees the form should be sent to SHS, U-4011, Attn: Animal Handler Review. The physicians will use the information from these forms as a basis for determining any necessary treatments and/or health counseling.
 - ❑ **Form C – Personal Profile for Non-University Affiliates** – This form is to be filled out by those non-affiliated personnel who are named on research protocols or service providers who require access that could include animal contact. This form (if used) should be sent to EHS Unit 4097.
 - ❑ **Form D – Area Access for Non-Animal Users** - Use this form when university personnel or university sanctioned visitors will be working in animal areas but anticipate no actual animal contact. They should be made aware of potential hazards involved in working within animal areas. Send form to EHS Unit 4097.

Note: Under some circumstances, new employees may be required to be medically evaluated by an Occupational Health provider prior to commencing work with and around animals; for existing

employees and student employees, medical consultation services are available at no charge upon their request or acceptance. Contact EHS for more information (860-486-3613).

- For classes that utilize animals, read **IACUC Policy # SI-04-2010: Students Registered in Classes or Programs Described in Protocols**. This document can be found at the Research Compliance/IACUC web site: <http://research.uconn.edu/iacuc/iacuc-policies/>. This provides guidance for what must be covered for training students working around and handling the animals used in class.
- Make a copy of the **First Aid Instructions** found under forms at: <https://ehs.uconn.edu/biological-health-and-safety/> and post it prominently in your lab(s).
- For those who bring animals (living birds or mammals, or whole carcasses) back to their laboratories, the labs must have a sign posted at the lab doors warning employees that animals are present in their workplace **Allergy Warning Sign** found under forms at: <https://ehs.uconn.edu/biological-health-and-safety/> (Barns and ACS facilities are exempt from this posting requirement).
- **Inform your personal physician that you work with animals.** Remind the physician of this fact when he or she is making a diagnosis of any illness. Immunocompromised individuals or those who are or may become pregnant should consult with a physician before working with animals.

General University Requirements for PI's and/or Supervisors

- **Workplace Hazard Assessment** – this form must be filled out by the PI or supervisor to indicate hazards and identify possible personal protective equipment necessary for each job category within their work area. The form and instructions can be found at: <https://ehs.uconn.edu/workplace-hazard-assessment-wha/>.
- **Employee Safety Training Assessment** (formerly Employee Safety Orientation) –PI's or supervisors are required to fill out and review an Employee Safety Orientation form for each employee (faculty, staff or student employee). Once reviewed the employee and supervisor both sign the form and submit to EHS. This includes new hires, transferred employees or people whose job function has changed. The form and instructions can be found at: <https://ehs.uconn.edu/esta/>

INSTRUCTIONS FOR ANIMAL HANDLER EMPLOYEES (NON-STUDENT)

- Read this Occupational Health and Safety Program for Animal Handlers. Seek clarification for any areas you do not understand. Additional health and safety-related information can be found at the EHS web page: www.ehs.uconn.edu. Do not hesitate to ask your PI or to call EHS if you have further questions.
- Personnel Forms:
(all can be found at <http://media.ehs.uconn.edu/Biological/AnimalHandlersPersonnelFormsFormsABCD.pdf>)
 - ❑ **Form A – Personal Profile** – all animal handlers must complete and sign a Personal Profile. The completed forms are sent to EHS (Unit 4097) and will be updated yearly (maintain a copy for your records). EHS will track these forms and inform you when you need to update your records. Form A helps determine a personal risk assessment as well as documents your awareness of the Occupational Health and Safety Program for Animal Handlers. The second page of Form A is used to decline optional parts of the program.
 - ❑ **Form B – Confidential Personal Health History** – this optional form is for all animal handlers. All employees (non-student) who choose to fill out this form should send to EHS, U-4097 Attn: Occ Med Review and mark as “confidential”. The forms will be forwarded for Occupational Health review with supporting documentation. The physicians will use the information from these forms as a basis for determining any necessary treatments and/or health counseling.
 - ❑ **New employees may be required to make a medical appointment prior to working with or around animals to receive counseling and testing as required by this Program.**
- If you have not done so, review and fill out, with your supervisor, the Employee Safety Training Assessment. The form and instructions can be found at: <https://ehs.uconn.edu/esta>.

Note: If you are an existing employee, medical surveillance services are available to you at no charge upon your request or acceptance.

- Inform your personal physician that you work with animals. Remind the physician of this fact when he or she is making a diagnosis of any illness. Immunocompromised individuals or those who are or may become pregnant should consult with a physician before working with animals.

INSTRUCTIONS FOR ANIMAL HANDLER STUDENTS/STUDENT EMPLOYEES

- Read this Occupational Health and Safety Program for Animal Handlers Seek clarification for any areas you do not understand. Additional health and safety-related information can be found at the EHS web page: www.ehs.uconn.edu. Do not hesitate to ask your PI or to call EHS if you have further questions.
- Personnel Forms:
<http://media.ehs.uconn.edu/Biological/AnimalHandlersPersonnelFormsFormsABCD.pdf>
 - ❑ **Form A – Personal Profile** – all animal handlers must complete and sign a Personal Profile. The completed forms are sent to EHS (Unit 4097) and will be updated yearly (maintain a copy for your records). EHS will track these forms and inform you when you need to update your records. Form A helps determine a personal risk assessment as well as documents your awareness of the Occupational Health and Safety Program for Animal Handlers. The second page of Form A is used to decline optional parts of the program.
 - ❑ **Form B – Confidential Personal Health History** – this optional form is for all animal handlers. When used, this form is sent directly to SHS (Unit 4011) attention: Animal Handler Review. The physicians will use the information from these forms as a basis for determining any necessary treatments and/or health counseling.
 - ❑ **Form C – Personal Profile for Non-University Affiliates** – This form is to be filled out by those non-affiliated personnel or visiting students who are named on research protocols. This form (if used) should be sent to EHS (Unit 4097).
 - ❑ **New student employees may be required to make an appointment and visit SHS prior to working with or around animals to receive counseling and testing as required by this Program.**
- Student employees, if you have not done so, review and fill out with your supervisor the Employee Safety Training Assessment. The form and instructions can be found at: <https://ehs.uconn.edu/esta>.

Note: If you are an existing student employee, medical surveillance services are available to you at no charge upon your request or acceptance.

- Inform your personal physician that you work with animals. Remind the physician of this fact when he or she is making a diagnosis of any illness. Immunocompromised individuals or those who are or may become pregnant should consult with a physician before working with animals.

INSTRUCTIONS FOR VISITORS WHO WILL HAVE ANIMAL CONTACT AND FOR OUTSIDE SERVICE PROVIDERS WITH ANIMAL CONTACT

Read this [Occupational Health and Safety Program for Animal Handlers](#). Seek clarification for any areas you do not understand. Additional health and safety-related information can be found at the EHS web page: www.ehs.uconn.edu. Do not hesitate to ask your PI, supervisor, or UConn representative sponsor or to call EHS if you have further questions. **Visitors will not be provided with pre-exposure immunizations or physicals but are advised that as part of this program it may be recommended that they have the immunizations or physician consults prior to initiating work with animals. This program can serve as a guide for such recommendations.** The cost of emergency care, medicines, diagnostic tests, and serology are the responsibility of the individual visitor or the individual vendor.

- Forms: (all can be found at the EHS web site under Biological Health and Safety <http://media.ehs.uconn.edu/Biological/AnimalHandlersPersonnelFormsFormsABCD.pdf>)
 - **Form C – Personal Profile for Non-University Affiliates** – This form is to be filled out by those nonaffiliated personnel who are named on research protocols or vendors who require access that could include animal contact. This form (if used) should be sent to EHS (Unit 4097).
- Inform your personal physician that you work with animals. Remind the physician of this fact when he or she is making a diagnosis of any illness. Immunocompromised individuals or those who are or may become pregnant should consult with a physician before working with animals.

INSTRUCTIONS FOR UNIVERSITY PERSONNEL OR SANCTIONED VISITORS WHO NEED ANIMAL AREA ACCESS BUT WILL HAVE NO DIRECT ANIMAL CONTACT

This form is to be used by University personnel (such as Facilities employees) or outside vendors who may be required to work in an animal area but will not be handling the animals. While the risk is minimized if not handling animals there are still potential hazards such as animal allergens to be made aware of. If you are aware of any personal health conditions such as allergies or asthma that could prohibit you from working in animal areas inform your supervisor. **Individuals with compromised immune systems and/or heart conditions should consult with a physician prior to working around animals, especially sheep.**

- **Form D – Animal Area Access for Non-Animal Users** - Use this form when university personnel or university sanctioned visitors/ vendors will be working in animal areas but anticipate no actual animal contact. They should be made aware of potential hazards involved in working within animal areas. Send form to EHS Unit 4097.

III. MEDICAL MONITORING & SCREENING PROGRAM

The University of Connecticut's Medical Monitoring & Screening Program includes comprehensive oversight for identified Animal Handlers, registered through Form A. The program is intended to comply with the recommendations made by the Institutional Animal Care and Use Committee (IACUC). These recommendations have been published in the Guide for the Care and Use of Laboratory Animals (National Research Council, National Academy Press: Washington, DC; 1996), and Occupational Health and Safety in the Care and Use of Research Animals (National Research Council, National Academy Press: Washington, DC; 1997).

Individuals covered by the program include faculty, staff, student employees working with animals, and in some cases, those handling animal tissues, body fluids, or wastes. Individuals involved in isolated, one-time animal contact will be informed of specific health precautions and appropriate inoculations or medical constraints. **Isolated one-time animal contact may not require participation in the medical monitoring program. The program requirements are based on the type and frequency of exposure to animals.** Employee identification and tracking will be managed by EHS.

Once an employee completes **Form B – Confidential Personal Health History** and submits it they become entered into the Medical Monitoring & Screening Program. This form can be found at <http://media.ehs.uconn.edu/Biological/AnimalHandlersPersonnelFormsFormsABCD.pdf>.

Individuals who use research animals and have submitted Form A shall be given access to this Program, other educational information, and they shall be offered access into the Medical Monitoring & Screening Program (Form B). The screening may include a comprehensive examination to make sure that the individual does not have any medical problems that would create a health risk when working with the animals. The screening will also provide baseline medical information to aid in the treatment of an animal exposure-associated injury or illness. It is especially recommended for individuals with high health risk animal exposure conditions.

High health risk includes exposure to pregnant sheep or goats especially in enclosed buildings, and unvaccinated carnivores (e.g., wildlife). The PI may identify other high health risk exposures. EHS should be contacted to determine the level of risk associated with the animal work in conjunction with the PI and appropriate medical staff.

Counseling on Occupational Reproductive Hazards is offered to individuals upon request.

All individuals are recommended to have a current tetanus immunization (within ten years from immunization or booster).

Program Exemptions: It has been determined that the observation of animals (e.g., observing a lab procedure or field studies with no direct handling of animals or tissues) does not present a workplace hazard; therefore, individuals who observe work with animals are exempt from medical monitoring unless work with the particular species includes work with biological or chemical toxins, zoonotic pathogens or human pathogens.

**SUMMARY OF MEDICAL MONITORING & SCREENING PROGRAM FOR
INDIVIDUALS HAVING RECURRENT ANIMAL CONTACT**

Health Assessment		
Medical Procedures That May be Indicated	Exposure Condition	Frequency
Baseline Health Assessment Medical History Respirator Review General Physical Exam Blood Drawn for Hematology Tetanus Immunization Rabies Immunization TB Test	Individuals having high health risk animal contact. * Individuals working with higher risk pathogens. ** All others with recurrent animal contact should have a risk assessment done in conjunction with the PI and EHS.	At the discretion of the reviewing physician.
Follow-up Health Assessment	Based on unique animal contact situations or some health condition of the individual	Recommended by physician at time of baseline health assessment
Immunization/Tests		
Medical Procedure	Exposure Condition	Frequency
Tetanus Immunization	All individuals with animal contact	Recommended of all individuals - frequency based on current ACIP recommendation***
Rabies Immunization	All employees exposed to unvaccinated carnivores	Recommended of all individuals exposed to unvaccinated carnivores - frequency based on ACIP recommendation****
Rabies Serum Titer	All employees exposed to unvaccinated carnivores	Recommended of all individuals exposed to unvaccinated carnivores - frequency based on ACIP recommendation****
Q fever Serum Titer	Employees who have contact with pregnant sheep or goats	Recommended if illness occurs
TB Test	Employees exposed to livestock	Recommended if livestock positive

*High health risk animal contact situations include individuals working directly with pregnant sheep or goats especially in enclosed buildings, and unvaccinated carnivores. Principal Investigators may also identify high health risk animal contact. Employees having daily exposure to large numbers of animals may also be considered at high health risk.

** Determination would be made by EHS, PI and physician.

***The Public Health Service Advisory Committee on Immunization Practices (ACIP) recommends immunization against tetanus every 10 years. An immunization is also recommended if a particularly tetanus-prone injury occurs in an employee where more than five years has elapsed since the last immunization.

****ACIP recommends immunization against rabies and serology titer every two years, after primary immunization with three (3) IM doses of HDCV or PCECV (titer to confirm continued immune response, at least complete neutralization at 1:5 serum dilution by RFFIT or 0.5 IU/mL or higher).

IV. FIRST AID AND OCCUPATIONAL INJURY REPORTING PROCEDURE

The Public Health Service of the U.S. Department of Health and Human Services directs research and teaching institutions to develop programs that promote the health and safety of employees who have substantial animal contact. Any occupational injury or hazardous exposure must be reported at once to the immediate supervisor for instructions on procedures for obtaining medical treatment. Reporting all accidents to the supervisor is necessary and must be prompt and accurate in order to assure proper handling of all claims. When dealing with chemical-related injuries, refer to the SDS for first aid information. **For serious injuries, call 911.**

In order to institute the vitally important post-exposure cleansing and flushing, sinks and eyewash stations should be located close to where an exposure may reasonably be expected to occur. First aid supplies should be at the basic level to encourage reporting to a medical care provider. **Every person working with animals should be aware of the potential danger from animal bites. Although an animal scratch or bite might not seem serious, its occurrence must be reported to the supervisor so that proper measures may be taken.**

First Aid Instructions for Animal Handlers must be posted in all animal use areas. For all animal-related injuries and illnesses, animal handlers and their supervisors must follow the procedures noted on the instructions.

V. POSSIBLE ADVERSE HEALTH EFFECTS

ANIMAL ALLERGIES

Animal allergies are the most common adverse health effect from working with laboratory animals. Allergic reactions to animal hair, dander, and urine and saliva proteins are common and, therefore, one of the most important occupational problems occurring in workers exposed to animals. Animal allergies represent a hypersensitivity reaction upon exposure to a research or laboratory animal, its fur, dander, urine, saliva, or other body fluids or tissues. Symptoms range from mild (with little effect on the ability to work) to severely debilitating (preventing further work near the causative allergens). Death can result from severe allergic reactions. Signs of an allergy include:

- upper respiratory symptoms, e.g., sneezing and itchy or running nose and eyes
- lower respiratory symptoms, e.g., wheezing, shortness of breath, and asthma, or a feeling of chest tightness
- skin symptoms, e.g., the appearance of red, raised, itchy areas after contact with animals, their tissues, urine, saliva, skin flakes, or even dusts contaminated with their waste products.

Allergies to animals are particularly common in workers exposed to cats, rabbits, mice, rats, gerbils, and guinea pigs. There is still some controversy regarding exactly what substance causes the allergy in a given individual. Previously most allergies were thought to be caused by dander and debris from the skin and fur of an animal. More recent studies seem to suggest that exposure to animal urine, saliva, and fecal matter may be equally as important. Exposure to animal urine may occur either through direct urine contact with skin or, more commonly, by inhaling dust from the bottom of a cage that has been contaminated with urine or fecal material.

Various studies show that 10 to 44% of workers exposed to animals will develop allergy symptoms within three years. Everyone should exercise certain precautions to attempt to prevent animal allergies. These attempts should not be focused only on people with atopic history. Symptoms can develop anywhere from months to years after a person begins working with animals.

Anyone with significant symptoms related to animal exposure should obtain medical advice. By identifying susceptible individuals prior to their exposure, strict codes of good laboratory and research practice can be implemented to reduce their contact with allergens. Animal handlers with a history of asthma, chest tightness, wheezing, or shortness of breath should have a spirometry at the time of their medical evaluation. A radiographic evaluation of the chest may be necessary depending on the individual history and spirometry results.

Certain procedures should be routinely followed in order to prevent the development of an animal allergy:

1. Work with animals should be conducted in well-ventilated areas to dilute allergenic particles at the source; high levels of airborne allergens occur in animal rooms, even when animals are undisturbed.
2. Workers must always wear proper personal protective equipment (PPE), as determined through the Workplace Hazard Assessment (see page 6), to prevent direct exposure to the animals and their products. Do not wear PPE outside of the animal/lab area.
3. Cages should be changed frequently to reduce buildup of animal allergens in the environment.
4. Any method that will reduce allergen contact and/or reduce the opportunities for contaminated dusts to become aerosolized should be employed, e.g., dust-free bedding materials, or use of ventilated cage-dumping stations.
5. Educational programs and good laboratory practice for all staff members working with laboratory animals could significantly reduce the incidence and severity of an allergy.
6. All laboratories and/or facilities that have animals (mammals) must be posted with a sign on the entrance of the laboratory and/or facility that animals are present in the workplace ([Allergy Warning Sign](#)). (Barns and ACS facilities are exempt from this posting requirement).

TETANUS (ALL PERSONNEL)

Tetanus is an acute bacterial disease induced by the exotoxin of the tetanus bacillus, which grows anaerobically at the site of an injury. The intestines of horses and other animals, including humans, can serve as reservoirs for the bacteria and/or their spores, which are ubiquitous in the environment and can contaminate wounds of all types. The Public Health Service Advisory Committee on Immunization Practices (ACIP) recommends immunization against tetanus every 10 years. An immunization is also recommended if a particularly tetanus-prone injury occurs in an employee where more than five years has elapsed since the last immunization. **Every employee should have up to date tetanus immunizations.**

ZOONOSIS

Zoonotic diseases are diseases that can be passed on from animals to humans. While many diseases are species specific, zoonotic diseases, caused by bacteria, viruses, or other microorganisms, can infect humans as well as animals.

Zoonotic diseases can be spread by many routes such as direct contact, indirect contact (contaminated water, bedding, lab benches, etc.) and vector transmission (insects). The pathogens can be ingested or inhaled or can infect through contact with mucous membranes or bites and scratches.

SUMMARY OF ZOONOTIC AGENTS

Disease Risks

1. In animal-associated research, there are several infectious disease concerns:
 - a) Animal to researcher/caretaker disease transmissions
 - b) Researcher/caretaker to animal disease transmissions
 - c) Animal to animal (between and among species) transmissions
 - d) Animal to debilitated, immunosuppressed, or pregnant human disease transmissions
 - e) Contaminated objects (animal housing, experimental probing equipment, etc.) to researcher/caretaker/animal transmissions
2. The University has a comprehensive program in place which, through processes for animal procurement, health monitoring, and selective use of quarantine, minimizes risk of human exposure to organisms of concern, including zoonotic agents. However, no program is 100% effective, and any personnel working with animals should be advised that they may be exposed to pathogens as part of their work. **The use of animals caught in the wild for research purposes is prohibited without approval from IACUC.**

3. Infectious disease risk may occur naturally (endemic diseases), accidentally (bites or scratches), from unknown exposure, or experimentally (as a part of the project or inadvertent contamination of other animals or people). Many bacteria, some parasites, fungi, and some viruses are not species specific, and may readily infect man and other animals. Infection resulting in disease depends on several factors, such as preexisting disease or immunologic state of the individual, the infecting agent's virulence and dose, or route of exposure. Some of the more common and/or serious infectious diseases (zoonoses) transmitted from animals used in research laboratories to man include:

RABIES (PERSONNEL EXPOSED TO UNVACCINATED CARNIVORES)

Rabies is a relatively rare and devastating viral disease that can result in severe neurologic problems and death. Most cases of rabies occur in wild animals although any mammal can contract the disease. The disease is virtually unheard of in common laboratory animals, though dogs and cats are the exception to this. At UConn, research cats are purpose-bred in barrier facilities. These animals are non-infectious for rabies as they have received rabies vaccine from the vendor. All bites of any type must be reported immediately to the supervisor.

Rabies is an endemic disease in Connecticut, especially in raccoons, skunks, foxes, and bats. It is not necessary to have a bite to develop the disease. Aerosols from urine, feces, and saliva can be infective. In fact, there was a case of rabies infection that occurred in a young girl due to a bat flying around in her bedroom with no recollection of actual contact made. Sporadic cases have been well documented in other species of wildlife, as well as domestic animals. Animals and animal tissues from field-collected animals should be handled with care. Precautions should take into account the facts that infected animals may shed the virus in the saliva before visible signs of illness appear, and that rabies virus can remain viable in frozen tissues for an extended period. **If University activities involve working with potential unvaccinated rabies vectors (including field work with wild animals or necropsy of potential rabies vectors), personnel must have the pre-exposure rabies series (as noted below) and have titer checks at least every 2 years for as long as they are working with those vectors. Personnel not wishing to be immunized cannot be forced to receive the shots but will not be allowed to work with rabies vectors.**

The primary immunization (pre-exposure) involves three doses of rabies vaccine at times 0, 7 and 21 or 28 days. Serology is recommended two years after the 3 dose pre-exposure series and every two years thereafter to confirm an adequate immune response for those considered at risk. At UConn we have an initial serology done 1-2 months after the pre-exposure series is complete to confirm an immune response. After an exposure to a rabid animal, two booster doses of the vaccine should always be given intramuscularly following the Centers for Disease Control and Prevention recommendations. Refer to the most recent version of the CDC's Human Rabies Prevention – United States, Recommendations of the Advisory Committee on Immunization Practices (ACIP).

Q FEVER (PERSONNEL EXPOSED TO PREGNANT SHEEP OR GOATS)

Q fever is a disease caused by a rickettsial bacterium called *Coxiella burnetii*. This can be acquired by exposure to placental membranes and fetuses from infected sheep or goats. There is an especially high concentration of these infected materials in animals at the time that the animals give birth, so particular care needs to be used in handling newborn animals, placental tissues, and other products of conception. This would include the placenta, amniotic fluid, blood, or soiled bedding. In addition, individuals who handle or provide routine care to young sheep or goats up to six months of age are at higher risk. This infection is extremely contagious and has been reported to be spread by the aerosol route. It can also be shed in urine, feces, milk, and can be carried in the wool. Contaminated clothing may also be a source of infection.

In most individuals, the disease manifests itself as an acute illness that could be mistaken for influenza, and includes high fevers up to 104°F or 105°F that are accompanied by general malaise, significant muscle aches and pains, and very frequently by a cough. Up to half of the individuals who develop this acute disease will have a pneumonia that can be seen on chest x-rays. A large number of people will also develop hepatitis. In most patients, the disease is self-limiting and will resolve on its own after ten days to two weeks. In older or ill individuals, this acute illness may take one to two months to resolve. Even though it will resolve on its own, it is generally better to treat the disease with tetracycline because this does reduce the duration of fever. **It is extremely important that any employee who works with sheep or goats, and who develops an influenza-type infection, mentions to their physician the possibility of Q-fever. It is something that would not routinely be thought of, and so the diagnosis is often missed.**

Rarely a person may develop a chronic infection with the Q fever organism. This happens in less than 1% of infected individuals, and manifests itself as endocarditis, which is an infection on the valves of the heart. This is

virtually always fatal when it does occur. 90% of the people who develop this have some previous problem with their heart valves; therefore, **people who have congenital heart disease, prior valvular heart disease, or who have a chronic immunocompromised state should not work with infected animals at the time of animal parturition.** It is best that these individuals not work with sheep, goats, and cattle at all. This can be determined on a case-by-case basis. Immunocompromised individuals are people who are immunocompromised because of certain chronic diseases such as HIV and people who are immunocompromised because of medications which they take.

In order to limit the spread of Q fever, there are a number of procedures that should be followed. Unless a lab or animal care facility can certify that only *Coxiella* negative animals are used, laboratories using sheep or goats, and animal care areas housing these animals, should be strictly off limits to anyone who does not have a specific need to be there. Gloves should always be used in handling the placentas and newborns of these animals. It is important that animals be transported carefully to avoid infecting others besides laboratory personnel. Potentially contaminated surfaces should be decontaminated with appropriate disinfectant such as dilute solutions of chlorine bleach, MichroChem – Plus (recommended), or Virkon S. These organisms are quite resistant to destruction and many ordinary methods of disinfecting will not be adequate. It is extremely important that laboratory doors be kept closed when experiments are in progress. Employees working with potentially infected tissue need to wear protective clothing that is not worn outside the area.

There is no effective vaccine available in the U.S. to protect humans from Q- fever. Serum tests may be done for females of childbearing age if they have been exposed to Q fever.

SALMONELLOSIS (ALL SPECIES)

Salmonellosis is an infection with the bacteria *Salmonella*. Most people infected with *Salmonella* develop diarrhea, fever, and abdominal cramps within 12-72 hours of infection. The illness usually lasts 4 to 7 days and most recover without treatment. However, for some individuals diarrhea can be more severe and hospitalization is necessary.

Salmonella lives in the intestinal tracts of most animals. *Salmonella* are usually transmitted to humans by eating contaminated foods, however, in research and animal care settings it is most often associated with improper hand hygiene after handling animals, eating before washing hands or eating within the animal facility.

Healthy individuals are less likely to become sick from *Salmonella*. The elderly, infants, and those with impaired immune systems are more likely to have severe illness. Protect yourself by wearing gloves if appropriate when handling animals and always follow proper hand washing practices after handling animals.

ZOONOSIS BY SPECIES

For a list of zoonotic diseases by animal species refer to [Summary of Zoonotic Agents \(By Research Animal\)](https://ehs.uconn.edu/biological-health-and-safety/) found at: <https://ehs.uconn.edu/biological-health-and-safety/>

OTHER ZOONOTIC CONCERNS

There are a number of animal pathogens that although they do not get passed to humans directly via animal contact, they are passed on by common vectors such as ticks or mosquitoes and are thus of zoonotic concern. Some examples are:

- Eastern, Western, and Venezuelan Equine Encephalitis – common hosts are horses, spread by mosquito bites.
- West Nile Encephalitis – common hosts are birds but can infect humans, horses, cats, and domestic rabbits among others. Spread by mosquito bites.
- Lyme Disease – common disease reservoir is wild rodents. Can infect horses, humans, and other mammals, spread by tick bites.
- Ehrlichiosis – bacterial pathogens of the genus *Ehrlichia* transmitted by ticks. Have been found to infect humans, dogs, cattle, sheep, goats, and horses.
- Babesiosis – another tickborne disease caused by a microscopic parasite that infects red blood cells.

Bloodborne Pathogens: Investigators who use human cells in animals would be included under the OSHA Bloodborne Pathogens Standard. Further information about bloodborne pathogens can be obtained through EHS. Bloodborne Pathogen training sessions are offered monthly by EHS for anyone who works with bloodborne pathogens or those who could be exposed to bloodborne pathogens such as some animal care workers.

VI. PERSONAL HYGIENE AND PROTECTION

SMOKING, EATING, DRINKING, AND COSMETICS APPLICATION

Smoking, eating, drinking, applying cosmetics, installing contact lenses and similar procedures, or evidence of, are prohibited within an animal facility or animal study area, except in designated areas that are free of contaminated materials. Food and drink must be stored in a separate refrigerator maintained for this purpose only, and located outside of the area where animals are used or housed. Under **NO** circumstances shall food or drink be stored in a refrigerator or freezer containing animals, animal specimens, animal medicines, culture plates, etc.

PERSONAL PROTECTIVE EQUIPMENT/CLOTHING FOR ANIMAL RESEARCHERS AND HANDLERS

The preferred method of reducing or eliminating occupational hazards is through engineering controls (such as ventilation or physical barriers) or administrative controls (such as job rotation or time exposure limitation). Whenever engineering or administrative controls cannot adequately mitigate hazards or are not feasible, personal protective equipment /clothing (PPE) must be provided to employees by the supervising section or department, e.g., ACS for ACS staff, College of Agriculture for Farm Department workers, etc. In accordance with [1910 Subpart I - Personal Protective Equipment](#) of the Occupational Health and Safety Administration (OSHA) regulations, a **Workplace Hazard Assessment must be performed by the PI prior to assigning PPE to employees, and supervisors must certify in writing that such assessments have been made. Workplace Hazard Assessment Forms and instructions can be found at EHS Forms page under General Health and Safety: <https://ehs.uconn.edu/workplace-hazard-assessment-wha/>.** Supervisors must enforce the wearing of required PPE, and must ensure that employees are trained in the proper use and limitations of PPE.

1. Disposable gloves are useful to prevent the transmission of diseases between animal rooms and to limit the possibility of disease transmission between animals and humans. They are also useful to limit staff exposure to contact allergens and may also be required when working with hazardous chemicals as stated in a product's SDS. Disposable gloves must be available to caretakers and research personnel who have contact with animals, animal tissues, soiled animal cages, or hazardous chemicals during their duties. Proper selection is critical and should be based on the hazard involved. Contact EHS for assistance with proper glove selection. Disposable gloves must be discarded when they are visibly soiled, torn, punctured, or otherwise damaged such that their ability to act as a barrier is compromised. Prior to leaving an animal room or anteroom, personnel must discard their gloves and wash their hands thoroughly. Some personnel may develop contact dermatitis allergy to latex or to absorbent material used to lubricate the glove. **To reduce the risk of a latex sensitization reaction occurring, the use of non-latex gloves (such as nitrile) is strongly recommended for all personnel.**
2. Protective eyewear must be worn by employees who handle or are exposed to corrosive or otherwise dangerous liquids, mists, or vapors. Chemical splash goggles or other devices that completely shield the eyes must be provided by the department. When face shields are required, goggles or safety spectacles must also be worn beneath the face shield. Contact EHS for assistance in the selection of proper safety eyewear.
3. Uniforms and laboratory coats should be laundered so that clean protective clothing is worn daily. Disposable protective items, such as gloves, masks, and head and foot covers, and gowns or other body cover, must be provided when use of these items is required as determined through the Workplace Hazard Assessment. Protective clothing may not be taken away from the work site. Protective clothing used with radioactive material or is known to be contaminated with radioactive material shall not be laundered and must be disposed of by the authorized laboratory worker in the appropriate EHS Radiation Safety provided radioactive waste container.
4. Upon arrival at the animal study site, and depending on the work to be done, animal care personnel should change out of street clothing and into clean uniforms, or laboratory coats should be worn over street clothes when animals are handled. Uniforms must be changed whenever they become soiled. At the end of the workday, uniforms should be placed in a hamper or disposable laundry bag designated for soiled clothing.

This will help prevent contamination of street clothes. Laboratory clothes should be left in the lab and must **NOT** be worn while eating or in public eating areas.

5. Special Circumstances: Special equipment and clothing may be required when personnel are engaged in studies that involve hazardous biological, chemical, or radiological materials. The specific measures needed must be appropriate for the agents used, as determined by the PI and ACS in consultation with EHS.
6. A respirator, which includes an N-95 mask, may be worn voluntarily as described in UConn's Respirator Program found at: <https://ehs.uconn.edu/occupational-health-and-safety/>. When use of a respirator is mandated under the program, medical approvals for respirator use will be required and masks will be fit tested. Mandated circumstances include: exposure to OSHA-recognized airborne hazards, exposure to workplace allergens for those with medically documented allergies, or when otherwise required by a supervisor/PI.
7. Employees who are at risk of crushing foot injuries from heavy objects must wear impact-resistant footwear.
8. The noise level in animal facility areas may reach potentially damaging levels, particularly in cage washing areas and certain animal housing rooms. Hearing protection may be necessary whenever noise levels exceed those permissible by OSHA, or whenever requested by an employee. EHS should be consulted to conduct a sound survey to determine if employees are overexposed. These employees will be entered into the University's Hearing Conservation Program (<https://ehs.uconn.edu/occupational-health-and-safety/>), and will be required to wear hearing protection and undergo annual training and audiometric testing.

PROTECTIVE MEASURES FOR ANIMAL RESEARCHERS AND HANDLERS

1. **Hand Washing** - Careful hand washing must be done after handling animals and prior to leaving the laboratory for any reason. Wash your hands for 15-30 seconds with a mild soap and water. One of the most effective disease preventative methods available when treating any injury that breaks the skin is *immediate* and *thorough washing* of the injury with soap and warm water. See [First Aid Procedures](#) for more details about treating injuries.
2. Certain infections are transmitted from animals to humans primarily by the animals' feces or urine contaminating our hands, which then may contaminate items put into our mouths. An example of an organism utilizing this mode of transmission is Salmonella. Every precaution should be taken to avoid this mode of transmission by vigilance and careful personal hygiene. Additional health problems may be encountered when these organisms are carried home and children/infants are exposed. Personnel should be trained to avoid hand contact with their eyes, face, mouth, or other body surfaces with contaminated gloves or hands. Care is needed to prevent contamination of doorknobs, faucet handles, paper towel dispensers, telephones, computer keyboards, drawer pulls, refuse container lids, and similar objects by personnel with contaminated gloves.
3. All work surfaces should be decontaminated daily as specified by protocol or Standard Operating Procedures (SOP), and after any animal use or spill of animal-related material.
4. All contaminated or infectious substances should be handled in such a manner as to minimize the formation of aerosols.
5. Mechanical pipetting aids must be used. **Mouth pipetting is prohibited**, unless a written justification for doing so has been approved by the Institutional Biological Safety Officer. Any such approval would require the use of an in-line mechanical means of preventing exposure.
6. Contaminated materials that cannot be decontaminated in the laboratory/facility itself must be placed in containers that are both leak-proof and durable before they are removed from the laboratory/facility. Specific procedures from EHS should be in place for the disposal of these materials.
7. Use of a bedding change station or biocontainment cabinet to change bedding: A device that draws aerosols away from the caretaker (such as an air filtered change station) should be used when soiled, contaminated bedding is removed from animal cages. In addition, the caretaker must always wear proper personal protective equipment and clothing, as determined through the Workplace Hazard Assessment (see your supervisor) to prevent direct exposure to the animal products when removing soiled bedding from cages.

Ordinarily soiled bedding should be removed from cages in the cage washroom, rather than in the animal rooms.

8. Back injuries are a common hazard for animal facility employees because of lifting requirements. Employees should always practice safe lifting techniques. Whenever feasible, lifting chores should be mechanized by using hydraulic or other lifting techniques to preclude personnel back injuries. When manual lifting must be done, proper lifting techniques should be employed. Upon request, EHS provides training on back injury prevention and lifting techniques. Back braces may be made available to employees who perform lifting tasks; however, as with all other PPE, employees must be trained in their proper use and limitations. Tasks should be made as ergonomically efficient as possible with special consideration given to repetitive movements such as pipetting or standing and/or sitting for long periods of time. EHS can assist with ergonomic assessments.
9. Whenever water or moisture is present, walking surfaces may become slippery due to spilled water or slime/algae growth, and result in slips and falls. Slip-resistant footwear and floor mats, grit-containing floor surfacing materials, and thorough floor cleaning can help prevent a loss of footing. Floor clutter and equipment interfering with unimpeded walking or uneven walking surfaces can cause trips and falls, so good housekeeping practices and maintaining even walking surfaces is important. Contact EHS for more info on this. **Whenever electricity is used in a wet or moist environment, it is mandatory that a ground fault circuit interrupter (GFCI) be used.** GFCIs detect leakage of stray current and open (trip) the circuit at a detected leakage level low enough to help prevent human injury and heart fibrillations; thus, GFCIs are people-protectors while circuit breakers are more equipment protectors.
10. There are numerous requirements for handling large animals. Investigators contemplating their use should contact ACS (860-486-3736) or EHS (860-486-3613) for an update on disease risks before ordering animals.
11. No animals may be kept overnight outside of the designated animal housing rooms. Exceptions may be granted to this rule only by the IACUC.

Additional specific precautions are necessary when handling biohazardous agents. Guidelines for their use should be obtained from EHS. **All investigators using biological agents (animals, microorganisms, human materials, biological toxins, plants, invertebrates, recombinant or synthetic nucleic acids) must have an approved Institutional Biosafety Committee (IBC) registration. Failure to have an approved IBC registration may delay the IACUC protocol review process.**

VII. PROCEDURES FOR RESEARCHERS AND ANIMAL CARE STAFF UTILIZING HAZARDOUS AGENTS

GENERAL PROCEDURES FOR WORKING WITH HAZARDOUS AGENTS

1. Warning signs and safety protocol for animal rooms that contain hazardous agents (biological, chemical or radioactive, x-ray, or laser hazards): A complete copy of the safety protocol for the hazardous agents found in an animal room should be made available to all who enter the animal room. The safety protocol should contain all relevant information necessary to identify the personnel, procedures, safety precautions, waste disposal, carcass disposal, and related information about the hazardous study.

In addition, the following information must be posted on the animal room door, cubicle, unit, or other area dividers:
 - a. Large biohazard, chemical hazard, or radioactive material, x-ray, or laser hazard sign, as appropriate, and a limited access warning sign (only hazard signs approved by EHS may be posted);
 - b. Name and telephone number of individual to contact in event of an emergency involving the agent;
 - c. Name of the hazardous agent(s) or hazard class; and
 - d. Dress code and any personal protective equipment required for entrance into the room.
2. Animals receiving hazardous agents should be housed separately from other animals to prevent cross contamination and simplify the isolation of contaminated wastes. The use of negative-pressure ventilated racks, laminar flow units, and other similar HEPA-filtered devices are helpful in isolating small animals exposed to hazardous agents. Properly managed cubicles are suitable for confining experiments with

hazardous agents to small areas. Only authorized personnel who have met the prerequisite training requirements are allowed in these controlled areas.

3. The name of the hazardous agent or hazard class should appear on the cage cards of animals treated with the agent.
4. **Special Considerations:** Immunologically compromised rodents such as the nude mouse and SCID mouse, that receive human xenografts, body fluids, blood, cells, or human infectious agents and related materials, present a potentially unique and poorly understood (zoonosis) risk. These rodents may develop persistent infections while remaining otherwise healthy. For this reason, such animals injected with these materials must be handled with caution, following Biosafety Level 2 or 3 practices in accordance with the recommendation of the Biosafety Officer.
5. **Standard Precautions:** Standard Precautions (SP) is an approach to infection control in which all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens. Intended primarily for personnel working directly with human blood components, other body fluids and excreta, and unfixed tissues, SP is relevant to all personnel working with potentially infectious materials in animal studies when animals may harbor human materials. Personnel working with animals treated with such materials must receive annual Bloodborne Pathogens training to comply with the OSHA Bloodborne Pathogen Standard.

PROCEDURES FOR ANIMAL RESEARCHERS AND HANDLERS

1. **Adequate animal restraint:** The chance of accidental needle sticks is reduced if animals are anesthetized or chemically restrained before being injected with hazardous agents. Manually restrained, non-anesthetized animals are often capable of jarring needles and redirecting their path, or by struggling and causing spills.
2. **Prevention of aerosol formation:** Whenever possible, hazardous agents should be prepared or purchased in rubber-topped vials so that the aerosols associated with open tube manipulations can be minimized. Solutions containing hazardous agents should never be expressed through a needle into disposal containers or disinfectant pans because of the aerosols produced; rather, the syringe with solution should be discarded directly into an appropriate puncture-proof sharps container. When infectious agents are used, the sharps container should be sterilized in a steam autoclave before contacting EHS for proper disposal.
3. **Use of hoods or safety cabinets:** Hazardous agents should be injected or otherwise administered within an appropriate biosafety cabinet or chemical fume hood. When technical considerations make such a practice impossible, exceptions must be justified and approved by EHS.
4. **Work in pairs when manipulating animals:** The fewer manipulations that a single individual must perform when handling hazardous agents, the better. Should an accident occur, it is much safer to have a second person available to assist in decontamination procedures and to audit the accident. People working alone are often reluctant to acknowledge mistakes or accidents. This strategy should be utilized wherever it is prudent to do so.
5. **Reduce distractions:** When hazardous agents are being manipulated in an animal facility, distractions should be minimized. Research personnel should contact animal care staff to schedule a time for animal manipulations so that routine cleaning and husbandry procedures can still be performed. Loud noises should be minimized.
6. **Cleaning, feeding, and watering animals treated with hazardous agents:** If both treated and untreated animals are housed in the same room, the untreated animals should be cleaned, fed, and watered first to reduce the possibility of accidental contamination of untreated animals. Rooms housing treated animals should be cleaned last and animals in these rooms fed, watered, and manipulated after these procedures have been completed in other rooms. Upon completion of a study involving use of infectious or other hazardous material, the room housing animals exposed to such agents should be decontaminated before introduction of new animals. The EHS Biosafety Officer should be consulted to determine the best method to decontaminate the room. This will vary with the hazardous agent in use and cannot be generalized. It is important that personnel performing the decontamination be informed about their task, and provided the protective clothing indicated by the Biosafety Officer.
 - a. During experiments involving radioactive material, the authorized research laboratory personnel are primarily responsible for the radioactive animals and the associated equipment used for the experiments. Animal Care staff must follow the procedures specified in the Radiation Safety

training for ancillary personnel. If animal rooms or equipment are designated for a radioactive material experiment, the EHS Radiation Safety Officer must be contacted at the conclusion of the experiment to free release them for unrestricted use. No equipment should be removed from the designated room until it is formally released by Radiation Safety staff.

7. Use of a bedding change station or biosafety cabinet to change bedding: A device that draws aerosols away from the caretaker (such as an air filtered change station) should be used when soiled, contaminated bedding is removed from animal cages. In addition, the caretaker must always wear proper personal protective equipment and clothing, as determined through the Workplace Hazard Assessment (<https://ehs.uconn.edu/workplace-hazard-assessment-wha/>), to prevent direct exposure to the animal products when removing soiled bedding from cages. Ordinarily soiled bedding should be removed from cages in the cage washroom, rather than in the animal rooms.
 - a. Animal Care staff shall not handle or dispose of bedding used for radioactive material experiments with animals; this will be the responsibility of the authorized laboratory worker.

BIOLOGICAL AGENTS AND CONTAINMENT

The CDC/NIH handbook, Biosafety in Microbiological and Biomedical Laboratories (BMBL), describes the **minimum** containment requirements that are to be followed when microbial agents are used in the laboratory and in the animal facility. A Biological Safety Manual has been prepared to address containment practices and policies specific to UConn. The determination of the appropriate containment level for biological agents used in animal research is the responsibility of the IBC and the Biological Safety Section of EHS. You can download the BMBL at <http://www.cdc.gov/biosafety/publications/> and the Biological Safety Manual at <https://ehs.uconn.edu/biological-health-and-safety/>.

RADIOACTIVE MATERIALS

The safety principles for working with radioactive materials are similar to those for other hazardous agents with some important additions:

1. The UConn Radiation Safety Committee and EHS Radiation Safety Officer (RSO) must review and approve a specific radionuclide protocol authorization for a potential Licensed Investigator (LI) in advance of work with licensed unsealed or sealed radioactive material. The protocol includes specific radionuclides that will be used and the amounts and specific radiation safety procedures to be followed when using radionuclides in animals. This is in addition to the required IACUC protocol.
2. Personnel working with licensed sealed or unsealed radioactive material must work under an authorized LIs protocol and complete the pre-requisite EHS Radiation Safety user training. Personnel are also required to receive and document laboratory-based training from their LI.
3. Personnel who do not use radioactive material but must enter a radioactive material controlled area are required to complete either the pre-requisite Radiation Safety initial non-user training and receive and document laboratory-based training conducted by the LI or the Radiation Safety training for ancillary personnel, as applicable.
4. All radioactive material acquisition, use, and disposition of radioactive waste must be in accordance with the Nuclear Regulatory Commission (NRC) regulations, UConn's NRC license conditions, the University's Radiation Safety Manual, and the LIs protocol authorization.

The use of the UConn sealed gamma source for animal research irradiations by research personnel requires in-person user training specific to the irradiator and successful completion of an irradiator user exam. Users must be escorted by a member of the Radiation Safety staff at all times for the in-person training and during irradiations. Contact the RSO for more detailed information and requirements if use for research purposes is required.

DIAGNOSTIC OR ANALYTICAL X-RAYS

1. Personnel planning to use diagnostic or analytical x-ray equipment must complete the pre-requisite EHS Analytical X-Ray Safety initial training and receive and document formal laboratory-based training from their x-ray equipment supervisor.
2. Use of the UConn IVIS SpectrumCT x-ray imaging system for animals requires compliance with the

IACUC Standard Operating Procedure SOP-03-2016 procedure for use of the imaging system. Any other proposed x-ray imaging system will require a similar SOP to be developed and approved in advance by the IACUC and Radiation Safety.

3. Personnel who do not use the x-ray equipment but must enter an x-ray equipment area are required to receive and document a laboratory-based training conducted by the LI or the Radiation Safety training for ancillary personnel, as applicable.

LASERS

1. The UConn EHS Laser Safety Officer (LSO) must review and approve a specific Laser Standard Operating Procedure (SOP) for a Class 3B or Class 4 laser in advance of proposed work with the laser. The SOP includes requirements for safety controls, proper protective eyewear, and signage. This is in addition to the required IACUC protocol.
2. Personnel working with a Class 3B or Class 4 laser must complete the pre-requisite EHS Laser Safety user training. Personnel are also required to receive formal laboratory-based training from their Primary Laser Researcher (PLR).
3. Personnel who do not use Class 3B or Class 4 lasers but must enter the posted laser laboratory area required to receive laboratory-based training conducted by the PLR or the Radiation Safety training for ancillary personnel, as applicable.

WORK WITH ANESTHETIC GASES

Anesthetic gases/vapors such as nitrous oxide and isoflurane are commonly used in laboratory animal research protocols. Researcher exposure occurs primarily through inhalation of waste anesthetic gases unintentionally released into the laboratory environment. Consult the appropriate SDS for specific hazards. Possible health effects of overexposure to anesthetic gas may include, but are not limited to:

- **Acute effects:** Drowsiness, irritability, depression, headaches, dizziness, nausea, and problems with coordination, audiovisual ability, and judgment.
- **Chronic effects:** Liver and kidney disease, adverse reproductive effects and cancer.

Virtually all anesthetic gases carry some degree of health risk to animal workers. Provisions should be made to protect workers by the use of gas scavenging devices or, where appropriate, ventilated hoods or other systems that prevent exposure to the worker. An anesthetic gas SOP (ACS SOP 5016) is available for all animal users and can be found here: <http://oac.uconn.edu/sops.html>. Access to this web site is controlled by ACS.

HAZARDOUS CHEMICALS

The cornerstone for any lab safety program is the Chemical Hygiene Plan, as required by the OSHA regulation, *Occupational Exposure to Hazardous Chemicals in Laboratories* (29CFR 1910.1450). It is important to make the distinction between laboratories and non-laboratory facilities which may involve chemical usage. University researchers working in laboratories are referred to the University's Chemical Hygiene Plan at <https://ehs.uconn.edu/chemical-health-and-safety/>. For non-laboratory areas, refer to the University's Hazard Communication Program at <https://ehs.uconn.edu/occupational-health-and-safety/> which complies with OSHA's regulation, *Hazard Communication* (29CFR 1910.1200). In the case of animal care facilities, PIs, in conjunction with the EHS Chemical Hygiene Officer, need to assess the potential risks to animal handlers from hazardous agents in terms of dose, duration and frequency of exposure. Also, the potential routes of exposure must be taken into account. Engineering controls such as local exhaust in cage cleaning activities minimize any risk due to inhalation of an agent excreted into the bedding. Absorption of potential agents via skin contact can be minimized by personal protective equipment including gloves, lab coats and/or aprons, foot protection, etc., as determined through the Workplace Hazard Assessment (<https://ehs.uconn.edu/workplace-hazard-assessment-wha/>). This would apply as well to activities where a puncture wound could lead to a route of entry of an agent. Lastly, ingestion can be controlled administratively by forbidding any food or drink in animal care facilities, which could lead to contamination and subsequent ingestion.

For some chemical hazards, the risk may be mitigated by special housing requirements or following established SOPs for their use. The IACUC in conjunction with the EHS Chemical Hygiene Officer will direct PIs to those resources as necessary.

When a PI assesses risk to chemicals of known toxicity, he/she should refer to toxicity data found in Safety Data Sheets (SDSs), LD50 data, and NFPA hazard ratings, as well as peer reviewed journal articles. The PI should consult with the University Chemical Hygiene Officer in EHS for further assessment. Based on this structured approach to risk assessment, the PI's can develop a SOP for their experiments. As referenced in the book *Occupational Health & Safety in the Care & Use of Research Animals*, under the section entitled "Protocols Involving Chemicals of Unknown Hazard," these models require a collaborative planning process, leading to accepted safety procedures which minimize exposure of the animal care staff and other animal workers to hazardous chemicals present in animal tissues, animal secretions, soiled bedding, and elsewhere in the animal environment. The key elements to safety when working with hazardous agents include trained, knowledgeable personnel to perform the study, and prior review and approval of the proposed use of hazardous agents by qualified personnel. A second objective is to make a hazard determination on any waste generated to see if it meets the EPA definition of "hazardous waste." Contact EHS Hazardous Waste Specialist to make this determination.

Prior to animal research involving hazardous chemicals, principal investigators and lab personnel must complete and document having taken Initial Laboratory Safety & Chemical Waste Management, take the yearly retraining as necessary, and comply with all applicable [guidelines](#) in the UConn *Chemical Hygiene Plan*, *Chemical Waste Disposal Manual* and *Controlled Substance Policy*. Hazard notifications must be posted outside animal cages or rooms during experiments by the principal investigator or other authorized lab personnel to ensure Animal Care staff are made aware of any hazards.

SAFETY DATA SHEETS (SDS)

Although all chemicals and drugs are potentially dangerous, special concern is necessary when working with known carcinogens, mutagens, immunosuppressive agents, toxic drugs, potent steroids, agents of unknown pharmacological activity, and other chemicals classified as hazardous waste by the EPA. All chemical agents purchased commercially must have a Safety Data Sheet (SDS, formerly known as MSDS) that accompanies the shipment of the chemical. The animal facility must maintain a file of SDSs, and a copy of SDSs should be readily accessible to all users. For non-laboratory areas, refer to the University's Hazard Communication Program at <https://ehs.uconn.edu/occupational-health-and-safety/>. SDS resources may be found on-line at <https://ehs.uconn.edu/chemical-health-and-safety/safety-data-sheets/>.

WASTE DISPOSAL

Regulated waste management resources can be found at <http://ehs.uconn.edu/Regulated%20Waste%20Management/>

1. Bedding contaminated with hazardous agents may present one of the most difficult management problems. Contamination with infectious agents may require that bedding be sterilized before being transported to the cage washroom for dumping. If soiled bedding containing hazardous material cannot be rendered harmless prior to transporting to the cage washroom, it may be necessary to bag, or double bag the bedding prior to disposal. Cage bedding should never be flushed down floor drains. Regardless of the nature of the waste, the methods of disposal should be determined by EHS, and must meet NRC, EPA, DEEP, DPH, OSHA and CDC requirements.
2. Contaminated carcass disposal is often similar to disposal methods for other contaminated materials, but must reflect the nature of the hazardous agent in use. Upon completion of the necessary work with the carcass, it must be bagged, labeled, and disposed in accordance with accepted practice approved by EHS. Holding, when necessary, should be accomplished in a refrigerator or freezer reserved for carcass disposal.
3. Disposal containers can be obtained through EHS. To determine the appropriate container for the waste generated, or to request containers call 860-486-3613. Separate waste containers designated for authorized radioactive material experiments will be provided to the authorized research laboratory personnel by EHS Radiation Safety.

VIII. OTHER CONSIDERATIONS

NEEDLE AND SYRINGE DISPOSAL

The disposal of needles (medical sharps) with or without attached syringes is regulated by the state Department of Energy and Environmental Protection (DEEP). Needles shall **not** be recapped, unless a written justification for recapping has been approved by the Biological Safety Section of EHS. Dispose of needles, syringes, and other sharps by dropping them into approved puncture-proof containers, which must be located in every room where sharps are used. Never fill sharps above the fill line found on the sharps container. EHS provides sharps containers, call 860-486-3613. Order your sharps containers and view the different types of containers available at the EHS web site: <http://www.ehs.uconn.edu/Regulated%20Waste%20Management/> or can be accessed via the main EHS page: <http://www.ehs.uconn.edu/>.

TRANSPORTATION OF ANIMALS THROUGH NON-LABORATORY AREAS

Transporting animals into or through areas used by non-laboratory workers or visitors is to be avoided. When essential to do so, all reasonable means of minimizing health risks to others should be observed including but not limited to ensuring adequate animal restraint, use of proper enclosure to prevent animal escape and spillage of soiled bedding.

When possible, carts should be used to transport small to medium sized cages, and cages should be covered during transport to prevent animals being visualized inside the cages. Cages or other transport containers should be covered by a filter top during transit, and by a secondary cover that is opaque. This helps to calm the animals, and to limit allergen exposure from the cage to personnel indirectly exposed to the animals during transit.

IX. ADDITIONAL INFORMATION

Additional information may be obtained from the sources listed below:

Questions regarding this Animal Handlers Program should be directed to EHS at 860-486-3613.

Questions regarding risks and precautions to be followed should be directed to EHS at 860-486-3613.

Questions regarding a specific situation should be directed to the PI or area supervisor.

Questions regarding the Medical Monitoring & Screening Program and medical advice pertaining to animal contact should be directed to EHS for referral to SHS or OEM.

Links:

Summary of Zoonotic Agents (By Research Animal):

<http://media.ehs.uconn.edu/Biological/SummaryOfZoonoticAgents.pdf>

IACUC Animal Welfare Training: <https://research.uconn.edu/iacuc/iacuc-training/>

IACUC Policy # SI-04-2010: Students Registered in Classes or Programs Described in Protocols:

<http://research.uconn.edu/iacuc/iacuc-policies/>

CDC/NIH handbook, Biosafety in Microbiological and Biomedical Laboratories (BMBL):

<http://www.cdc.gov/biosafety/publications/>