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Environmental Health and Safety Document# PLN01 Animal Research Health and Safety Plan

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Stacy Volnick
VICE PRESIDENT OF ADMINSTRATIVE AFFAIRS

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POLICY MAINTENANCE SECTION

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FLORIDA ATLANTIC
UNIVERSITY

ENVIRONMENTAL HEALTH AND SAFETY

Animal Research Health and Safety Plan (ARHASP)

Florida Atlantic University
Office of Environmental Health and Safety
April 2021

PREFACE

FAU's Office of Environmental Health and Safety (EH&S) has developed this Animal Research Health and Safety Plan aimed at making certain that the health and safety of faculty, staff, and students whose activities involve the use of animals is maintained and addressed appropriately. The *Plan* details the program for occupational safety and health regarding animal use on our campus. They are modeled after the guidelines set forth in the *Guide for the Care and Use of Laboratory Animals* (Institute of Laboratory Animal Resources, National Research Council, 2011) and the *Occupational safety and health in the Care and Use of Research Animals* guidebook (Institute of Laboratory Animal Resources, National Research Council, 2003).

The program is administrated under FAU's Office of EH&S. Questions about the Occupational safety and health Program can be directed to the University EH&S Office at 561-297-3129 or ehs@fau.edu.

The Plan can also be found at: <http://www.fau.edu/ehs/safety/medicalmonitoringprogram/>

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SECTION I: OUTLINE OF THE FAU HEALTH AND SAFETY PLAN FOR ANIMAL RESEARCH

Part A: Program Goals & Responsibilities

The overall goal of an occupational safety and health program is to prevent occupational injury, illness and exposure.

The scope of this document applies to all animal-related research, training and testing under IACUC auspices.

FAU's Office of Environmental Health and Safety, and individual investigators and supervisors will:

- 1.) Provide those individuals, who have contact with animals, appropriate guidelines for occupational safety and health in the care and use of animals that outline general health and safety issues associated with working with animals
- 2.) Provide those individuals, who have contact with animals, the required occupational safety and health training program
- 3.) Provide those individuals who have contact with animals a hazard and risk assessment; and
- 4.) Make available to those individuals, who have contact with animals, any necessary medical evaluations, vaccinations, or immunizations (e.g., tetanus, rabies, etc.)

Part B: Occupational Safety and Health Program at FAU

Administration: The animal occupational safety and health program is administrated and enforced under The Office of Environmental Health and Safety.

The Office of Environmental Health and Safety is delegated oversight and authority for this program by University Policy on Environmental Health and Safety, [Policy 4.1.2.](#)

Many different campus offices and entities work together to create an encompassing and effective program of occupational safety and health in the care and use of animals at FAU.

Offices, committees, personnel, and their functions, include:

The IACUC Office

- Processes IACUC protocols and records
- Serves as a contact place and information center for Principal Investigators (PIs), personnel, and various collaborating offices about the IACUC
- Maintains a copy of emergency contact list for animal facilities
- Maintains status of personnel cleared to work in animal laboratories

The IACUC

- Helps to identify potential medical risks, animal housing facility designs, physical hazards, etc., during protocol review
- Refers investigators to other committees (IBC, IRB, etc.)
- Mandates appropriate training for investigators and their personnel
- Involves the Director of the Office of Environmental Health and Safety as an ex-officio member of the IACUC
- Assists in the evaluation of the OSH Program

Comparative Medicine, Attending Veterinarian

- Aids PIs in the formulation of their research projects, helping to identify potential risks and hazards
- In collaboration with Environmental Health and Safety to suggest alternatives to hazardous procedures, where possible.
- Refers PIs to other committees for protocol review
- Provide specialized training to animal researchers as directed by IACUC or as requested by the PIs
- Maintains a copy of emergency contact list for animal facilities

The Office of EH&S

- Administer policy regarding animal research health and safety.
- Provide a Laboratory Safety Officer for FAU.
- Provide environmental, health, and safety training programs for all personnel covered under this plan.
- Assess department, laboratory, and personnel adherence to the requirements of this plan.
- Enforce compliance with all environmental, health and safety policies, plans, manuals, and procedures.

Campus Police

- Respond to emergency situations and work with the Office of Environmental Health and Safety on emergency procedures
- Maintain a copy of emergency contact list for animal facilities

Designated Health Care Provider

- Provides evaluation of health assessments
- Provide medical exams and immunizations to high-risk and other designated personnel
- Help to identify further risks for personnel based on medical history or conditions (e.g., pregnant women, pre-existing allergies)

The designated medical providers (DMP) for FAU's Animal Research - Occupational Health Program is **Concentra.**

Occupational Health Clinic Location

- Boca – Concentra, 141 NW 20th St C9, Boca Raton, FL 33431

Note: The authorized clinics for management of workplace injuries are listed separately under Section 4.

FAU Facilities Management

- Repairs and maintains facility equipment and machinery
- Oversees campus custodial activities

Individual Campus Departments

- Provide fiscal support to laboratories and Principle Investigators, where appropriate.
- Ensure execution of preventive and corrective actions in research laboratories/studies.

Principal Investigators

- Review and update the functional and environmental demands/requirements associated with the work to be performed for each position, class or project
- Identify and require personnel who have **contact with animals** to participate in the Occupational Health and Safety for Animal Research Program.
- Complete the Hazard and Risk Assessment for high risk positions/substantial animal contact
- Pay for equipment purchases and/or repairs
- Purchase personal protective equipment (PPE) and enforce its use
- Implement all precautions or preventive measures outlined by the medical provider
- Design protocols involving animals
- Work with Comparative Medicine, Attending Veterinarian, IACUC, IRB, IBC, and EH&S to identify potential problems and risks to personnel
- Maintains risk and hazard evaluation information current in the EH&S BioRAFT Platform.
- Provide each individual, who has contact with animals, hands-on-training associated with the hazards and risks in the laboratory.
- Requires all laboratory workers with exposure to research animals to participate fully in the medical monitoring program

Staff, Students

- Responsible for personal hygiene and safety
- Comply with recommended and required rules and guidelines for occupational safety and health in animal care and use
- Attend and participate in training programs

Part C: Principal Elements of an Animal Care & Use OSH Program

The following elements and examples are essential components of an effective animal-use occupational safety and health program:

Personnel Training

- Training for specific protocol and department Safe Operating Procedures is the sole responsibility of the Department, PI and Supervisor

- Training will provide personnel with clear definitions and descriptions of their duties and the hazards associated with those duties (such as zoonosis, chemical hazards, physical hazards like radiation and allergies, handling waste materials)
- Training will provide personnel with information about levels of risk associated with working with animals and personal health conditions (e.g., special precautions to avoid hazards for pregnant women or persons with chronic diseases, etc.)
- Make certain that personnel are proficient in implementing safety precautions

Hazard Assessment (BioRAFT Platform and Hazard Assessment)

- Identifies hazardous biological, chemical, or physical agents
- Identifies potential hazards that are inherent to animal work, such as animal bites, chemical cleaning agents, allergens, or zoonosis
- Assesses extent and level of participation in occupational safety and health training program on the hazards posed by the animals and materials used; the exposure intensity, duration, or frequency; the susceptibility of the personnel; and the history of occupational illness or injury in the particular workplace

Personal Hygiene

- Set high standards for personnel cleanliness and hygiene
- Require suitable clothing, gloves, masks, head covers, coats, coveralls, shoe covers, etc.
- Require handwashing and changing clothes where necessary

Laboratory Safety

- Make certain that all laboratory personnel, including service and custodial staff and visitors, understand the chemical and biological dangers associated with the lab or facility
- Affix biohazard signs on doors outside laboratories where biohazardous material is handled or stored (available from the EH&S Office). The protocol to be followed in case of a spill of the biohazardous materials should be posted in a visible location in the laboratory or facility
- Restrict laboratory or facility access and keep doors locked when unattended
- Keep the facility clean and free of clutter. Make certain that emergency safety devices (fire extinguishers, eye washes, etc.) are easily accessible and in working order
- Make certain that all personnel, students and visitors wear protective clothing such as lab coats, gloves and safety glasses. Remove lab coats or gowns before leaving the laboratory or facility
- Do not eat, drink, smoke, store food and food utensils, apply cosmetics or lip balm, or insert or remove contact lenses while in the facility or laboratory
- Restrain long hair. Avoid wearing loose clothing or jewelry, shorts, open-toed shoes or sandals.
- Carry out procedures so as to minimize risks of splashes, spills, and generation of aerosols
- Pipetting by mouth is not allowed
- Use hypodermic needles only when absolutely necessary. Do not bend, break, shear or recap used needles. Use the appropriate sharps containers for disposal
- Wash hands after handling infectious material and before leaving the laboratory
- Decontaminate all contaminated materials before disposal or reuse
- Decontaminate laboratory surfaces following any spill of biohazardous materials, when appropriate and at the end of each workday.
- Report all spills, accidents, and incidents immediately (as required by the EH&S 24-hour reporting requirement)

For a full list of all laboratory safety requirements, reference the [FAU Laboratory Safety Manual](#)

Facilities, Procedures, and Monitoring

- Maintain cleanliness of facilities and supplies
- Consider ergonomics and request for assessments
- Inspect, maintain, and repair equipment
- Dispose of contaminated bedding properly

Animal Experimentation involving Hazards

- PI's, departments and supervisors must maintain up-to-date written policies governing experimentation with hazardous biological, chemical, physical agents
- Individuals must use recommended practices and procedures, and facility requirements for working with hazardous biological agents and materials
- Individuals must use special facilities and safety equipment as recommended
- Individuals must dispose of hazardous or contaminated waste properly

Personal Protection

- Obtain required clothing, shoes, shoe covers, gloves, arm protectors, masks, face shields, safety glasses/goggles, hearing protection, respirators, etc. from your supervisors

Medical Evaluation and Preventive Medicine for Personnel:

- Comply with required medical evaluations for high risk positions and those with contact with animals
- Comply with DMP-recommended immunizations, and vaccinations for particular individuals
- Inform personnel how to report accidents, injuries, illnesses, exposures and property damage

SECTION II: HAZARDS AND RISKS

Part A: Defining Hazard and Risk

What is a hazard?

A hazard is the inherent danger involved in working with a particular animal, material, equipment, process, procedure or system.

What is risk?

Risk is a measure of the likelihood of a consequence from working with a certain hazard.

What are the hazards involved in working with animals and animal projects?

There are many hazards involved in working with animals. These hazards range from minor to very serious, and can include things like allergies, bites, zoonotic diseases, working with hazardous chemicals or radiation, and handling contaminated waste. Information follows in this document that describes many of the potential hazards individually.

What are the risks involved in working with animals?

The risks involved range from a low to high potential of injury or illness from the identified hazards.

What can be done to avoid hazards and reduce risk?

The primary way to avoid problems in work with animals is to know what the hazards are and what precautions to take in order to avoid them.

Part B: Animal Workplace Hazards & Risks

1. Types of Hazards

The following chart outlines some, but not all categories and types of potential hazards that may be present in work with animals.

Example: Types of Hazards that May be Present during Work on Animal Protocols.

Types	Examples
Physical Hazards	Bites, sprains, scratches, sharps, lasers, machinery, slips, falls
Chemical Hazards	Burns, skin irritations, inhalation, ingestion
Zoonosis	Human diseases acquired from animals
Allergens	Allergies to rodents, cats, dogs (urine, contaminated litter, dander, hair)
Ergonomics	Heavy lifting, repetitive motion, body mechanics, posture
Infectious Agents	Bacteria, fungi, parasites, protozoa, rickettsia, viruses, bloodborne pathogens

Types	Examples
Field Work	Fieldwork represents a different set of hazards but also includes many of the traditional laboratory hazards as well.

Reference **APPENDIX C** for detailed hazard tables for Chemical, Zoonoses, and Non-Animal hazards.

Reference **APPENDIX D** for detailed hazard tables for fieldwork.

3. Animal-related Risk Levels

This model animal risk assessment summary is for risk ranks of animal-related activities for immunocompetent adult humans. Risk ranks are based on both the likelihood of an incident and the seriousness of the possible abnormal condition. Risk levels for experimental agents are not included in the chart and use of experimental hazardous agents requires review and approval of the appropriate safety committee.

Risk of	Bite wound (a)	Scratch wound (a)	Microbial flora exposure (b)	Allergy development
Chick embryo	1	1	2	1
Birds	2	2	2	3
Fish	1	1	2	1
Reptiles	3	1	2	1
Amphibians	1	2	2	1
Mouse	2	2	1	3
Rat	3	2	1	3
Hamster	3	2	1	2
Guinea Pig	2	2	1	3
Rabbit	2	3	1	3
Cat	3	3	3	3
Dog	3	2	2	2
Sheep, Goat	1	2	3	2
Pig	2	1	3	2
Wild mammals & birds	4 (if handled)	4 (if handled)	3	2
Cattle	1	1	3	2
Bison	1	1	3	2
Horse	1	1	1	1

Key:

1 = No known risk

2 = Minor risk

3 = Moderate risk

4 = Significant risk

- (a) = Potential microbial contamination and physical trauma are both included. Tetanus prophylaxis is recommended for all staff members.
- (b) = Risk of inhalant, ocular, or oral exposure to microbial or parasitic agents from animals acquired through institutionally approved vendors.

4. Zoonosis Risks and Preventative Measures

A disease transmitted from animals to humans are called zoonosis. In many cases the animals show few, if any, signs of illness. A bacterium in the normal flora of a healthy animal may cause a serious disorder in a person exposed to it. While the animals have developed “resistance” to these microorganisms, humans with no previous exposure to the agent lack this protective immunity. Therefore, one should always be aware of possible consequences when working with each type of animal and then take precautions to minimize the risk of infection.

Zoonoses can be acquired through various routes of infection, including contact with animal products, the animal itself, or a byproduct of the animal. The routes of infection include ingestion, inhalation, and penetration of broken or unbroken skin, wound penetration, and contact with the mucous membranes of the eyes, nose, and mouth via the following:

- Animal bites and scratches;
- Contact with animal tissues and cultures, body fluids, and excreta;
- Inanimate objects that are contaminated by the animal or animal contact; and
- Exposure to aerosols produced resulting from activities such as cleaning cages.

Individuals whose work involves substantial exposure to or handling of animals and animal tissues, body fluids, and cell cultures must be aware of the possibility of the illnesses that may be transmitted by contact with animals. In the zoonosis training module, at-risk individuals are informed of laboratory-acquired zoonoses, causative microorganisms, animals most commonly in contact with humans, appropriate animal handling procedures, personal hygiene, and protective equipment specific to the animal type and use.

All known human exposure to a zoonotic disease is considered an incident and must be immediately reported by the individual to their supervisor or principal investigator for appropriate medical treatment and investigation. An FAU Incident Report must also be filed immediately or within 24 hours to EH&S (APPENDIX A).

If a zoonotic disease is suspected in an animal, the principal investigator or supervisor and the FAU Attending Veterinarian shall be notified immediately for appropriate action.

The **APPENDIX C** includes a table with some of the common zoonoses which may be present in the laboratory setting.

5. Allergens Risks and Protective Measures

Allergens. Approximately 20% of people who work with animals have animal allergies. Animal allergies may be present before an individual begins formal work with animals, or the allergy may

develop during the course of the individual’s work with animals. Animal hair, fur, skin, dander, urine, saliva, scratches, etc., can cause or aggravate allergies to animals.

The following table includes some of the common allergens found in animal research.

Animal	Source	Symptoms	Protective Measures (if allergic) *
Mouse**	Hair, dander, urine Serum	Sneezing, congestion, coughing, hives, swelling, watering eyes, itchy eyes and difficulty breathing.	Protective clothing, including protective gloves to avoid nails breaking the skin. Use of a N95 respirator mask. For allergies that produce hives or difficulty breathing, avoid work in Laboratories with these animals. Use dump station for bedding disposal. Utilize cage changing stations, individually ventilated cage racks, and biological safety cabinets, where feasible.
Rat**	Hair, dander, urine, and saliva Serum	Sneezing, congestion, coughing, hives, swelling, watering eyes, itchy eyes and difficulty breathing.	Protective clothing, including protective gloves to avoid nails breaking the skin. Use of a N95 respirator mask. For allergies that produce hives or difficulty breathing, avoid work in laboratories with these animals. Use dump station for bedding disposal. Utilize cage changing stations, individually ventilated cage racks, and biological safety cabinets, where feasible.
Bird**	Skin, feathers, cage bedding and droppings	Runny nose, watery eyes, stuffy nose, itchy throat, and sneezing.	Protective clothing, including protective gloves to avoid nails breaking the skin. Use of a N95 respirator mask. For allergies that produce hives or difficulty breathing, avoid work in laboratories with these animals. Use care and respiratory protection when cleaning bottom of cage.
Latex or latex containing items	Gloves, vaccine vials, tape, stethoscope, blood pressure cuffs, IV tubing, syringes, and other similar materials.	Nasal, eye, or sinus irritation. Hives or rash. Difficulty breathing. Coughing or wheezing. Nausea, vomiting, or diarrhea.	Notify supervisor of any known allergy to latex before performing work and avoid potential latex sources unless specifically aware those materials do not contain latex.

*Any use of respiratory protection will be conducted under consultation with EHS and the DMP.

** Additional precautions include handwashing protocols, filtered ventilation, and optimal air changes and space pressurization.

6. Risk Factors to Individual Personnel

Examples of Risk Factors to Individual Personnel.

Personnel type	Risk(s)	Caused by
Women of childbearing age, individuals with chronic or pre-existing conditions	Threat to fetus, worsening of pre-existing condition; further illness or complications	Exposure to cat feces (toxoplasmosis), Isoflurane, exposure to animal skin, dander, fur, urine, etc.

Please refer to **Appendices C and E** for additional information on risks and preventive measures.

7. Fieldwork

Researchers performing fieldwork must complete Appendix D, Field Health and Safety Plan Form and submit to EH&S for review and approval. The form will be used by the researcher to train field personnel regarding the hazards and controls associated with the fieldwork being performed.

Appendix E provides detailed information on the potential hazards present in fieldwork conditions.

Part C: Levels of Risk and Participation in the Animal Research Program

1. Risk Communication

PI's, departments, supervisors and employees must consider the hazards and risks involved with each task or project conducted in their lab or facility.

PI's, departments and supervisors must complete **Appendix A – Workplace Hazard Assessment for Personnel with Animal Contact** and discuss the potential hazards and risks associated with the animal work tasks that will be performed. This risk communication addresses broad issues and questions like:

- 1) What are the potential work-related animal, non-animal, and individual hazards and risks involved with the work you will be performing or supervising?
- 2) What preventive measures or actions are available (e.g., training courses, medical examinations, immunizations or vaccinations, personal protective equipment, avoiding contact with certain species) that could reduce, avoid, or eliminate identified hazards and risks?

The PI will provide a copy of the completed hazard assessment to the employee and also maintain it on file within the department for review during inspections.

2. Health Assessments/Examinations:

As part of the hazard and risk assessment, individuals should carefully consider the information provided as they complete the **medical monitoring request forms in BioRAFT**. These forms are intended to provide the Medical Provider with information on the health hazards, demands and risks involved with the work that will be performed. A Designated Medical Provider (DMP) will complete an examination of the employee to determine potential risks for work in the laboratory and with animals and recommend appropriate vaccinations. Cost of the evaluation, exams, vaccinations, immunizations, or other recommended medical procedures will be paid by FAU at no cost to the employee.

Vaccinations may be recommended based on consultation between the Medical Provider and the Employee. Individuals may participate voluntarily.

- 1.) **Tetanus immunization:** Boosters are suggested every 10 years. The history of immunization will be determined at the time of the initial assessment. Additional immunizations will be administered as needed.
- 2.) **Rabies immunization:** Pre-exposure immunizations with follow-up antibody titers every two years; repeat immunizations are required as follows if personnel:
 - A. Work directly with the rabies virus
 - B. Are exposed to animals or animal parts with potential of containing the rabies virus
 - C. Are responsible for the control of wild animals on campus
- 3.) **Other:** Based on the health and hazard assessment, the consulting physician will advise the employee of the need for other or additional immunizations (such as tuberculosis or hepatitis).
- 4.) **Allergies:** Allergies should be identified on the medical monitoring form in BioRAFT. Individuals with *pre-existing* allergic tendencies will be encouraged by the DMP to seek help from their private physician.
- 5.) **Special Precautions for Women of Childbearing Age:** Female caretakers, especially those known to be pregnant, should not be exposed to pregnant sheep, cattle, goats, and cat feces (possibility of toxoplasmosis infection). Working with hazardous drugs, agents or toxic chemicals during pregnancy is also strongly discouraged. Personal protective equipment (PPE) should be worn at all times and additional precautions observed for pregnant women, as outlined by the principal investigator, supervisor or physician prior to the start of work with animals. Communicate your work conditions to your medical provider.

3. Medical Provider Reports

Following the medical exam, the health care provider will provide a copy of the Medical Provider Health Assessment Report (Laboratory Clearance Status Report) to FAU.

- 1.) No existing health condition has been identified that could alter the employee's exposure-risk profile. **OR**
- 2.) A health condition exists that affects the employee's exposure-risk profile, but the risk can be minimized (and will provide example precautions or preventive measures – e.g., vaccinations; wearing gloves, masks, etc.; avoiding contact with certain species – that would minimize or eliminate the hazards and risks). **OR**
- 3.) A health condition exists that affects the employee's exposure-risk profile that cannot be eliminated or minimized.

All medical records are confidential. They will be maintained by the Designated Medical Provider and will be shared only with the patient/individual. The Laboratory Clearance Status Report will provide only recommendations regarding clearance to work in a laboratory and any special precautions or restrictions that are recommended by the DMP. No medical information will be provided on the clearance document.

If a health condition exists, or there is a change in one’s health that could alter the individual’s exposure-risk profile, the individual will inform their supervisor of the medical provider’s recommendations for eliminating the risk.

4. Levels of Risk & Participation

Occupational Health Program Participation Based on Risk/ Rank of Animal-Related Activity.

Risk Category	Worker Types	Exceptions
Level 1 (no known Risk)	<ul style="list-style-type: none"> • Work requiring infrequent and limited access to animal laboratory facilities for inspections, etc. • Field work involving non-contact with animals 	Access animal laboratory facilities a maximum of 2 times per year and only under escort.
Level 2 (minor risk)	<ul style="list-style-type: none"> • Indirect contact with laboratory animals <ul style="list-style-type: none"> ○ Maintenance workers ○ Vendors* ○ Workers in nearby areas ○ Others may apply 	Access animal laboratory facilities >2 times per year; may be unescorted.
Level 3 (moderate risk)	<ul style="list-style-type: none"> • Comparative Medicine • Animal Care Staff • Direct contact with Laboratory Animals and captive wildlife species. • Work in a laboratory with animal model utilization. 	None
Level 4 (significant risk)	<ul style="list-style-type: none"> • Direct contact with animals in the field 	If the field work involves contact with only domesticated animals.

* Vendors will be advised regarding potential hazards with indirect contact with animals; would not fall under fiscal responsibility of the FAU program; an employer program would be required, where applicable.

Occupational Health Program Participation Based on Direct/Indirect Contact with Animals

Risk Category	FAU Animal Training Program Section 3	Risk Communication with Supervisor/PI	Training in animal handling & protective measures	Medical evaluation & surveillance recommended	Immunizations or Vaccinations
Level 1 (no known Risk)	Optional	Optional	Optional	Optional	Optional*

Risk Category	FAU Animal Training Program Section 3	Risk Communication with Supervisor/PI	Training in animal handling & protective measures	Medical evaluation & surveillance recommended	Immunizations or Vaccinations
Level 2 (minor risk)	Awareness	Yes	No	Yes	Recommended*
Level 3 (moderate risk)	Working Safely with Animals	Yes	Yes	Yes	Recommended*
Level 4 (significant risk)	Field Animal Research Safety	Yes	Yes	Yes	Recommended*

Risk Category	FAU Training Program Section 3	Risk Communication with Supervisor/PI	Training in animal handling & protective measures	Medical evaluation & surveillance recommended	Immunizations or Vaccinations
Indirect Contact Less than 3x per year.	No	No	No	No	No
Indirect Contact 3 or more times per year.	Yes	Yes	No	Yes	Recommended*
Direct Contact	Yes	Yes	Yes	Yes	Recommended*

* Recommended vaccines are based on consultation with medical provider.

Part D: Avoiding Hazards & Risks: Prevention & Control Strategies

1. Exposure Control & Prevention

Exposure Control Methods: (Includes some, but not all, strategies for avoiding, reducing, or eliminating exposure to hazards and risks).

Hazard or Risk Types	Prevention Strategy Examples
Engineering Controls	Practice product substitution; use barriers; allow for adequate filtration and ventilation; maintain proper temperature and humidity controls; regularly check fire extinguishers, alarms, sprinklers
Work Practice Controls	Alter animal handling and transport to reduce exposure; pay attention to personal hygiene, housekeeping, and waste management practices; be informed of and practice Safe (or Standard) Operating Procedures (SOPs)
Personal Protective Equipment (PPE)	Wear gloves, uniforms, gowns, aprons, hard hats, safety glasses, steel-toed boots, respirators, etc.
Training & Education (<i>also see below</i>)	Participate in university and departmental specific training program; follow SOPs (Mandatory Baseline Safety Training and Supervisor Safety Training).

Hazard or Risk Types	Prevention Strategy Examples
Equipment Maintenance & Operation	Follow SOPs; be trained in the proper use of equipment and machinery; regularly check machine performance (report any problems or needed repairs to supervisor immediately), maintain preventive maintenance, ensure calibrations and maintain in working order per manufacturer specs.
Animal Source	Purchase animals from reputable vendors; avoid contact with wild animals or animals of unknown origin; take necessary precautions (PPE, proper animal handling instruction) when it's necessary to work with high-risk species
Animal Housing, Caging, Bedding	Follow SOPs; wear gloves, protective clothing, use proper posture and body mechanics (lifting, pushing, pulling, etc.).
Hazardous Material Use	Follow SOPs; attend university training in lab and chemical safety
Waste Disposal	Follow university policies and procedures for hazardous waste removal (must dispose of the waste properly through EH&S)
Animal Transportation	Avoid transport animals through common, non-animal corridors or facilities (may expose non-animal personnel); use proper techniques and appropriate transport containers through IACUC-approved transportation routes.
Emergency Procedures	Know the contact people for each facility; be sure emergency phone numbers are posted in animal facilities; be familiar with standard emergency procedures like evacuation routes and emergency exits, what to do in the event of a chemical spill, which medical providers to go to in medical emergencies, and how to report injuries to the EH&S and HR.
Zoonosis	Obtain appropriate immunizations or vaccinations; wear gloves and protective clothing when handling species with zoonotic disease potential; participate in medical consultations and surveillance; avoid high-risk animals and situations
Animal Handling	Learn proper handling techniques; wear protective gloves, clothing, respirators, etc.
Good Housekeeping	Maintain a clean and organized work area that is free from clutter
Personal Hygiene & Safety <i>(also see below)</i>	Wash hands; wear PPE, as necessary
Women of Childbearing Age	Avoid all exposure to possible toxoplasmosis infection and/or do not have contact with cat feces; Avoid contact with hazardous chemicals – especially during the first trimester; wear PPE

Hazard or Risk Types	Prevention Strategy Examples
Medical Assessments & Immunizations/Vaccinations	Receive the recommended immunizations to prevent disease transmission; Learn strategies (such as wearing a mask) that would reduce or eliminate exposure to health-altering situations (like allergies)

2. Information on Education & Training

The extent of an individual’s personal involvement in the program will be determined by the assessment of the potential risks to the individual’s position at the University.

Departments, supervisors and principal investigators will be responsible to provide training for the students and employees working under their supervision. The training will be specific to the species and procedures to be used.

PIs will be responsible for maintaining records of risk communications (Laboratory-specific Training.) Training requirements use a calendar year requirement and documentation must consist of the following information: date of training, topics covered, name of the person providing the training, and the participants acknowledgement of attendance. Records should be maintained for duration of employment or duties in the laboratory, unless otherwise specified. Mandatory Animal Research Training conducted in Skillsoft or Citi, will be maintained within those systems.

Employees and supervisors/PIs are responsible for maintaining all training current.

3. FAU Training Program

The key element to a successful accident prevention program and in any occupational health and safety program is effective job orientation and safety and health training. FAU’s addresses the basic safety training and continuing education of the job elements, on-the-job safety, general health, and the prevention of injury and illness (Baseline Safety Training).

The program requires departments to complete on-the-job orientation and initial training for new, transferred and reassigned employees to different positions, along with periodic regular training on at least an **annual** basis for all employees.

Required training for all animal research workers will consist of the following:

- Laboratory Safety (Annual)
- Fire Safety and Prevention (Annual)
- Portable Fire Extinguisher Training (Annual)
- Hazard Communication (Initial only)
- Hazardous Material Handling and Storage (Initial only)
- Hazardous Waste Generator (Initial only)
- Working Safely with Animals (Initial only)

Situational required training could consist of the following:

- Animal Field Research Safety Overview (Initial only)

- Respiratory Protection (Annual)
- Radiation Safety (Annual)
- Laser Safety (Initial Only)
- Non-Ionizing Radiation (Initial Only)
- Bloodborne Pathogens (Annual)
- Biosafety Hazardous Waste Handling and Disposal (Initial Only)
- Visit the EH&S Website for more information on available training based on work to be performed.

Additional training will be conducted as follows:

- Whenever employees change positions or begin a new position for which training has not been previously received
- Whenever new species, substances, processes, procedures or equipment are added or changed that may present a new or previously unrecognized hazard
- Whenever an incident/accident investigation recognizes a training need

List of Current FAU IACUC Training Modules

Working with vertebrate and cephalopod species in research, teaching or testing activities requires oversight by the IACUC. Completion of required IACUC training is mandatory prior to working with animals.

IACUC training includes the following components and is species dependent.

- CITI online training
- Didactic session regarding the Ethical use of animals in research
- Didactic/hands on training sessions (animal model dependent)
- Enrollment in FAU's Occupational Health Program

For more information, please refer to the IACUC website ([Animal Research Mandatory Training](#)) or contact the IACUC office ([Dana Mulvaney](#) or [Kristen Ware](#)).

4. Emergency Procedures & Reporting Incidents, Injuries, or Illnesses

Emergencies

Dial 911 in the event of fires, medical emergencies, or other serious threats. University police may also be contacted at 561-297-3500 for non-emergencies. Follow the procedures outlined by your department in the event of emergencies.

If the emergency or problem involves the animals, refer to the emergency contact placards posted in the animal facility for the names and phone numbers of the appropriate contact person(s) for that facility. The FAU Attending Veterinarian can also be contacted in the event of animal emergencies.

Reporting Workplace Incidents, Injuries, Illnesses, or Near Misses

To promote a safe work environment, all work related near misses, incidents, injuries, illnesses and exposures will be *reported immediately or within 24 hours by the employee to their immediate supervisor or next person in charge at the time of injury, and EH&S.*

When a work-related incident/injury/illness/exposure occurs, **whether medical attention is needed or not**, the following steps must be followed:

1. Assess the injury. Is medical treatment needed, or is first aid adequate? If it is an emergency, call 911.
2. If non-emergency medical care during regular business hours is required, seek treatment at FAU’s Medical Provider. If it is after hours or if you are out of town, seek medical attention at the nearest medical facility.
3. For employees, supervisors will contact the FAU Workers’ Compensation Carrier, Amerisys, at 1-800-455-2079 to report the injury. It is the responsibility of the injured worker to communicate with Amerisys (workers comp provider) and his or her Supervisor, so as to keep them informed of any referrals, restrictions and medical visits.
4. Complete the FAU **incident report** for every incident and email to ehs@fau.edu **within 24 hours**. It is a requirement that incident reports be completed and submitted to the EH&S (for all injuries).
5. The Supervisor is required to assess the event/incident for immediate hazards and investigate. The Supervisor must identify and document corrective actions to prevent similar incidents from occurring again.
6. The injured individual is required to follow all medical restrictions, 24 hours a day, 7 days a week.

Event	Immediate Action	Contact	Send to	Notify
Student Injury or exposure	<p>Assess injury and determine if it requires emergency medical attention or follow up with a physician.</p> <p>If the injury/exposure is animal related, prepare a copy of this plan to send with the person</p>	<p>911 (if an emergency)</p> <p>Student Health Services (if medical care beyond first aid is necessary during working hours)</p> <p>Boca: 561-297-3512 Broward: 954-236-1556 Jupiter: 561-799-8678 HBOI – 772-871-5900</p>	<p>Student Health (if not sent by ambulance)</p> <p>Nearest Hospital (if medical care is needed after hours)</p>	<p>Submit Appendix B Incident Report Form to EH&S at ehs@fau.edu</p>
Employee or Volunteer Injury or exposure	<p>Assess injury and determine if it requires emergency medical attention or follow up with a physician.</p> <p>If the injury/exposure is animal related, prepare a copy of this plan to send with the person</p>	<p>911 (if an emergency)</p> <p>Occupational Clinic (during working hours) or nearest hospital</p> <p>Boca - US Healthworks/ Concentra: 561-368-6920</p> <p>Jupiter - Jupiter Medical Center Urgent Care: 561-263-7010</p> <p>HBOI - Lawnwood Regional Medical Center 772-461-4000</p> <p>Davie/Dania - Concentra: 954-941-6301</p>	<p>Concentra (during working hours)</p> <p>Nearest Hospital Emergency Room (after hours)</p>	<p>Submit Appendix B Incident Report Form to EH&S at ehs@fau.edu</p>

The **FAU Incident Report Form** is located in **APPENDIX B** of this document.

5. Animal Care after Human Injury

Special procedures may be required to identify the risk of human exposure to diseases for a particular animal. All samples, animals, or equipment involved in a human injury shall be preserved and have special identification to aid in further testing and/or procedures. The principal investigator or supervisor and the FAU Attending Veterinarian should be notified immediately for appropriate care of the animal, investigation of the incident, and corrective action. If the animal is used for teaching or research, medical information and care required shall be relayed to all participants.

Part E: Students in Classes, Volunteers and Ancillary Personnel

1. Students in Classes

As part of the health and safety plan for teaching, the instructor will write a hazard and risk assessment; train students on the risks associated with the class and discuss prevention techniques.

1. The Hazard and Risk Assessment will include a brief description of the class, the species of animals involved, and a description of student contact with the animals.
2. If a course is determined to be High Risk, the instructor will discuss with the class the potential hazards, zoonosis and the student's options for individual medical assessment.
 - a) High Risk – High probability of an adverse health effect, for example, students working with wild-caught mammals, or involved with lambing.
 - b) Low Risk – Low to moderate probability of adverse health effects.
3. Each principal investigator or instructor will provide students with contact to animals with the following information:
 - a) The availability of, and the option to request medical evaluation and treatment from Student Health Services (SHS). The student will provide SHS with a copy of the hazard and risk assessment during the medical evaluation.
 - b) Educational material regarding general information, potential hazards, universal precautions and personal hygiene
 - c) Other potential health and safety hazards

2. Volunteers, Guests, Visiting Researchers/Scholars

1. This includes individuals **NOT** listed on an Animal Care and Use Protocol and who are **not** FAU employees or students but **do have indirect contact** with animals used in research or teaching.
2. The Principal investigator or Facility Manager will provide each individual with information pertinent to the species/protocol on which they are working and document that the information has been provided.
3. Each principal investigator or instructor will provide those with contact to animals with the following information:
 - a) The availability of, and the option to request medical evaluation and treatment from their personal provider at their expense

- b) Educational material regarding general information, potential hazards, universal precautions and personal hygiene
- c) Other potential health and safety hazards

3. Ancillary Personnel

1. Ancillary personnel are those employees who **do not** have direct/substantial animal contact in their daily job functions, but who may need to enter an animal area in the course of performing their duties.
2. Ancillary personnel will be provided, by their supervisor or designee, information based on their need for entry into animal care facilities.
 - a) The availability of, and the option to request medical evaluation and treatment of a medical condition
 - b) Educational material regarding general information, potential hazards, universal precautions and personal hygiene
 - c) Other potential health and safety hazards

SECTION III: PROGRAM PROCESS

Step 1: Faculty, staff, principal investigators and students involved in the use of animals must complete the appropriate training indicated in Part D.3 of this document.

Step 2: Departments, supervisors, and principal investigators identify and require personnel who have **contact** with animals to participate in the Occupational Health Program. This is done primarily through review of the functional demands and environmental factors associated with the work to be performed (position description, class or project).

Step 3: The supervisor/department/PI assists the worker with completion of the animal contact form in BioRAFT.

Step 4: After completion and submittal of the Animal Contact request form in BioRAFT

- The enrollee will contact Concentra to set up an appointment.
- Enrollees must participate in the medical examination.
- If the Medical Provider recommends vaccinations only, individual may determine if the vaccine is desired or decline the vaccine.
- The Medical Provider will provide the status of the evaluation in BioRAFT.
- The FAU Laboratory Safety Officer will forward any precautions or preventive measures to the supervisor/department/PI (if applicable).
- Supervisor/department/PI will implement any and all precautions or preventive measure outlined by the Medical Provider.
- Employee is required to comply with precautions or preventive measures outlined by the Medical Provider. Employees failing to adhere to restrictions outlined by the Medical Provider will be prohibited from working in associated animal research environment.

Step 5: EH&S will maintain a database for all individuals. Re-evaluation are required annually or if the nature of the hazards (respirators, substantial risk areas, etc.) changes or and when there are changes in work assignments (change in species, contact level, etc.). These hazards and risks will be determined by the supervisor, principal investigator, faculty, etc.

Step 6: Complete all University required training prior to beginning work and annually thereafter.

SECTION IV: PROGRAM EVALUATION AND MAINTENANCE

The quality and effectiveness of an institution's occupational health and safety program can be sustained only through periodic evaluations of the program and a commitment to respond to changing circumstances.

Evaluation of program efficacy can be gained through a multitude of data points including incident reports, near miss investigations, IACUC and Biosafety compliance reports, and interviews with workers in the programs.

In order to ensure compliance and maintain the level of care consistent with higher education facilities throughout Florida, the following Audit Schedule is required at FAU.

- Compliance Inspection: EH&S or Designee Annually and as needed
- Animal Care Inspection and Program Review: IACUC Semi-annually

Laboratories are responsible for ensuring correction of any deficiencies cited.

This plan will be reviewed bi-annually by EH&S and IACUC to maintain safety information that is relevant and effective. Necessary updates regarding new protocols, animals, and hazards will be integrated into this document and published as needed.

APPENDIX A – HAZARD ASSESSMENT FORM

Workplace Hazard Assessment for Personnel with Animal Contact

Instructions: The PI or Supervisor of the worker will complete this table for the hazards the employee may encounter while working with animals and include strategies to mitigate those hazards. Pages three and four can be used as a guide. Multiple forms may be used, as needed, to include all work areas and job functions within the department. This form will be provided to and discussed with the employee and a copy maintained in the department for review during inspections. This form will be updated when there are hazards added to the laboratory or field environment.

Department:	Work Location(s):	PI or Supervisor:
Colleges:	Job Titles:	Employee:

Hazards Present	Check All That Apply	Description of Hazard (Work Performed?) Put N/A if it doesn't Apply	Hazard Mitigation Strategies		
			PPE	Hand-on Training	Other Controls
1. Allergens, dust or animal-based	<input type="checkbox"/>				
List all species of animals involved in the work:					
2. Biologically infectious materials	<input type="checkbox"/>				
3. Bites/Scratches	<input type="checkbox"/>				
4. Chemicals	<input type="checkbox"/>				
List all chemicals involved in the work or attach chemical inventory:					
5. Compressed gases	<input type="checkbox"/>				
6. Crush, Kicks, Step on	<input type="checkbox"/>				

Hazards Present	Check All That Apply	Description of Hazard (Work Performed?) Put N/A if it doesn't Apply	Hazard Mitigation Strategies		
			PPE	Hand-on Training	Other Controls
7. Electricity	<input type="checkbox"/>				
8. Ergonomic hazard	<input type="checkbox"/>				
9. Heat	<input type="checkbox"/>				
10. Horns/ Goring	<input type="checkbox"/>				
11. Machinery	<input type="checkbox"/>				
12. Noise	<input type="checkbox"/>				
13. Radiation, UV, Lasers	<input type="checkbox"/>				

List all Radioactive materials and sources:

14. Sharps, needle sticks	<input type="checkbox"/>				
15. Zoonotic agents	<input type="checkbox"/>				
16. Miscellaneous	<input type="checkbox"/>				

Assessment Completed by: _____ Signature: _____ Date: _____

Employee Briefed: _____ Signature: _____ Date: _____

Signature of PI: _____ Date: _____

Hazard Assessment Questionnaire

Check All That Apply	Questions	Hazards to Consider ^A
	Do you have contact with any of the following animals:	
<input type="checkbox"/>	Chickens or other poultry?	1, 12, 15
<input type="checkbox"/>	Cats or dogs?	1, 3, 12, 15
<input type="checkbox"/>	Exotics or wildlife?	1, 3, 12, 15
<input type="checkbox"/>	Insects?	1, 3
<input type="checkbox"/>	Large livestock (horses, cattle)?	1, 6, 8, 10, 15
<input type="checkbox"/>	Mice, rats or other rodents?	1, 3, 15
<input type="checkbox"/>	Pigs?	3, 8, 12, 15
<input type="checkbox"/>	Sheep/goats?	1, 8, 10, 15
<input type="checkbox"/>	Fish?	1, 3, 15
<input type="checkbox"/>	Birds?	1, 3, 15
<input type="checkbox"/>	Do you work with animals in a confinement environment?	1, 9
<input type="checkbox"/>	Do you work with animals in the wild?	3, 15
<input type="checkbox"/>	Do you do general husbandry for animals (feeding, cleaning, etc.)?	1, 8,
<input type="checkbox"/>	Do you change bedding/substrate/water of animals?	1, 3, 8
<input type="checkbox"/>	Do you move or transport animals?	8, 11
<input type="checkbox"/>	Do you do routine medical care on animals (inoculation, drawing blood, administering medication)?	4, 14
<input type="checkbox"/>	Do you perform surgeries or stand in close proximity while surgeries are occurring?	5, 14
	Do you perform euthanasia using any of the following?	
<input type="checkbox"/>	Inhalant agents (carbon dioxide, isoflurane, carbon monoxide, nitrogen)	5

Hazard Assessment Questionnaire

Check All That Apply	Questions	Hazards to Consider ^A
<input type="checkbox"/>	Noninhalant chemical agents	4
<input type="checkbox"/>	Cervical dislocation	3
<input type="checkbox"/>	Decapitation	3, 11
<input type="checkbox"/>	Electrocution	7
<input type="checkbox"/>	Penetrating captive bolt or Gunshot	8
<input type="checkbox"/>	Do you perform necropsies on animals?	8, 11, 14
<input type="checkbox"/>	Do you lift or move things weighing over 50 lbs.?	8
<input type="checkbox"/>	Do you perform repetitive tasks?	8
<input type="checkbox"/>	Do you work around machinery (tractors, cage washer, etc.)	11, 12
<input type="checkbox"/>	Do you work in areas with low light or no light?	8
<input type="checkbox"/>	Do you work in areas that are extremely hot or extremely cold?	9
<input type="checkbox"/>	Do you use sharps (needles, knives, etc.)?	14
<input type="checkbox"/>	Do you work in areas where there is a high likelihood of slips or trips?	8
<input type="checkbox"/>	Do you work with infectious biological agents?	2
<input type="checkbox"/>	Do you work with or are you potentially exposed to human blood or mammalian cells?	2
<input type="checkbox"/>	Do you work with chemicals?	4
<input type="checkbox"/>	Do you work with radiation or radiation producing devices such as lasers or UV?	13
<input type="checkbox"/>	Do you need to perform scientific diving and/or operate a scientific boat?	16

Check any of the questions that apply to the duties that you will be performing while doing your job.

^A The numbers in this column, correspond to the hazards listed in the “Hazards Table” on page 4

This table contains common hazards you may encounter while performing your job duties. The Mitigation Strategies can be used to complete “Your Hazards Table” on the Page 1. The suggested strategies are only suggestions and other mitigation strategies may be employed.

#	Potential Hazard	Controls	Additional Controls
1	Allergens, dust	FAU required PPE ^b , Training	Review and bookmark the FAU Animal Research Health and Safety Plan
2	Biologically infectious materials	FAU required PPE ^b , Training	Review and bookmark the FAU Biological Safety Manual .
3	Bites/scratches	FAU required PPE ^b , Training	Muzzle or other control mechanisms
4	Chemicals	FAU required PPE ^b , Training	Review chemical inventory and the safety data sheets for chemicals used
5	Compressed gases		Review and bookmark the FAU Laboratory Safety Manual
6	Crush, kicks, step on	FAU required PPE ^b , Training	Squeeze shoots or other controls when handling large animals
7	Electricity	On the job training	Review and bookmark the FAU Laboratory Safety Manual
8	Ergonomic hazard	Special evaluation by EH&S	Ergonomic monitoring by EH&S
9	Heat	On the job training	Review and bookmark the FAU Laboratory Safety Manual
10	Horns	On the job training	Review and bookmark the FAU Animal Research Health and Safety Plan
11	Machinery	FAU required PPE ^b , Training	Review the user manual for the equipment.
12	Hazardous Noise	Hearing protection	Request hazardous noise evaluation from EH&S
13	Radiation, UV, lasers	FAU required PPE ^b	Review and bookmark the FAU Radiation Safety Manual
14	Sharps, needle sticks	FAU required PPE ^b , Training	Review and bookmark the FAU Bloodborne Pathogens Exposure Control Plan .
15	Zoonotic agents	FAU required PPE ^b , Training	Review and bookmark the FAU Animal Research Health and Safety Plan
16	Diving and/or Boating Safety	FAU required training	Review the Diving and Boating Safety Programs and associated documents.

^a The numbers in this column correspond to the numbers in column 3 of the “Hazard Assessment Questionnaire”.

^b According to FAU policy, the minimum PPE that is required while working with laboratory hazards is lab coats or clothing protection, safety glasses or goggles, gloves, and closed toe and closed heel shoes. Additional protective equipment may be required based on the work performed and must be noted in the laboratory or field Standard Operating Procedures.

APPENDIX B – FAU INCIDENT REPORT

FAU INCIDENT REPORT

Name on Injured Employee:	Z #:
Department Name:	Date of Accident:
Office Location:	Time of Accident:
Office Phone #:	Place of Accident:

Employee s Description of Accident (Include Cause of Injury): 	
Part of Body Affected:	Injury/Illness that Occurred:
Injured Employee s Signature:	

Supervisor s Name:	Supervisor s Signature:
Agree with Description of Accident? <input type="radio"/> Yes <input type="radio"/> No	Office Phone #:
	Office Location (Bldg. # & Room #):

Keep a copy in your office, and send e-copy to: ehs@fau.edu and emprels@fau.edu

APPENDIX C – REFERENCE TABLES

Zoonosis Table

Research Animal **	Pathogen	Specific Zoonosis*	Hazards	Protective Measures
Feline (Sample)	Helminth Infections	Toxoplasmosis	Route of entry: oral. Can cause illness similar to the flu. Young, old and immunosuppressed susceptible to serious illness. Teratogenic.	Gloves, good hand hygiene. Pregnant women should not handle cat litter.
Bird	Bacterial Diseases	Psittacosis - Chlamydia psittacis	Route of entry: Inhalation Breathing in dust that is contaminated with bird droppings. May cause Blood tinged sputum, dry cough headache, joint aches shortness of breath	Gloves, gowns, respiratory protection, engineering controls, good hand hygiene.
Bird	Fungal Diseases	Histoplasmosis - Histoplasma capsulatum	Route of entry: Inhalation Breathing in dust that is contaminated with bird droppings. May cause fever and chills, cough, chest pain, mouth sores.	Gloves, gowns, respiratory protection, engineering controls, good hand hygiene.
Dolphin	Fungal Diseases	Lacazia loboi	Route of entry: Broken Skin. May cause skin lesions and tingling sensation	Gloves and good hand hygiene.
Fish	Bacterial Diseases	Mycobacterium species -M. marinum, M. fortuitum and M. chelonae	Route of entry: Skin -Direct contact with infected fish or contaminated water, may cause skin rash or boils	Gloves, good hand hygiene when handling fish and cleaning aquarium
Fish	Bacterial Diseases	Vibrio species - V. parahaemolyticus	Route of entry: Skin and Ingestion -Direct contact with infected fish or contaminated water. May cause watery diarrhea, vomiting and fever.	Gloves, good hand hygiene when handling fish and or contaminated water
Lion Fish	Toxin	Ciguatera Toxin	Route of entry: Skin puncture and ingestion - may experience nausea, vomiting, and neurologic symptoms (reverse hot and cold)	Cut resistant gloves and good hand hygiene.
Non-human Primate	Viral Diseases	Herpes B Virus	Route of entry: Eyes nose and mouth, can be fatal causing acute ascending myelitis.	Gloves, gown, surgical mask, face shield or safety

Research Animal **	Pathogen	Specific Zoonosis*	Hazards	Protective Measures
				glasses, gown, booties and bonnet
Non-human Primate	Bacterial Diseases	Mycobacteria tuberculosis	Route of entry: Inhalation - may cause chest pain, coughing, malaise, night sweats	Lab coat, gloves, respiratory protection, TB tine and chest x-ray
Polar Bear	Bacterial Diseases	Coxiella burnetii	Route of entry: Inhalation-breathing in dust that has been contaminated by infected birth products, feces, and urine. May cause flu-like symptoms or still births	Gloves, respiratory protection and good hand hygiene.
Rodents	Bacterial Diseases	Rat Bite Fever - Streptobacillus moniliformis	Route of entry: Skin- Bite or Scratch from rodent, Ingestion - Contaminated food water bedding may cause chills fever, joint pain, or swelling rash	Gloves, gowns, surgical mask, good hand hygiene. Engineering Controls for bedding
Wild Rodents	Viral Diseases	Hantavirus	Route of entry: Inhalation Breathing in dust that is contaminated with rodent urine or droppings. May cause fatigue, fever, and body aches. Could be life threatening with hantavirus hemorrhagic fever.	Gloves, gowns, respiratory protection, good hand hygiene.
Sea Lion	Bacterial Diseases	Leptospirosis	Route of entry: Skin and mucous membranes. May cause high fever, muscle aches, jaundice, abdominal pain	Gloves, eye protection and good hand hygiene
Shark	Toxin	Cyanobacterial toxin	Route of entry: Ingestion of shark fin -may experience nausea, vomiting, and neurologic symptoms	Gloves and good hand hygiene.
Sting Ray	Venom	Neurotoxin	Route of entry: Body Puncture - may cause vomiting, fever, tremors, paralysis, death may even occur.	Cut resistant gloves and good hand hygiene.

Research Animal **	Pathogen	Specific Zoonosis*	Hazards	Protective Measures
Turtle, Tortoise, Toad, and Salamander	Bacterial Diseases	Salmonella	Route of entry: Skin and Ingestion -Direct contact with infected turtle. May cause diarrhea (sometimes bloody), abdominal cramps, vomiting, fever, muscle pain. Young, old and immunosuppressed susceptible to serious illness.	Gloves, good hand hygiene when handling turtles. Cover open wounds with a waterproof dressing.
Frog	Bacterial Diseases	Mycobacteriosis, Chlamydiosis, Salmonellosis. Also, other organisms found in tank water.	Route of entry: Skin and Ingestion -Direct contact with infected frog or tank water.	Gloves, good hand hygiene when handling frogs or tank contents. Cover open wounds with a waterproof dressing.
Turtle	Rickettsial Diseases - Ticks Diseases Ticks	Rocky Mountain spotted fever; ehrlichiosis; Lyme disease, and STARI (southern tick-associated rash illness). ehrlichiosis; Lyme disease, and STARI (southern tick associated rash illness).	Route of entry: Skin, bite from tick. May cause headache, fever, stupor, skin rash/bullseye, muscle aches	Gloves, good hand hygiene when handling turtles, white clothing long pants
Whale	Bacterial Diseases	Brucellosis	Route of entry: Skin, Ingestion and Inhalation. May cause fever, sweats, headaches, back pains, and weakness	Gloves, mask or respirator protection and good hand hygiene.

* Note that most laboratory animals are obtained through controlled procurement chains to be free of the common zoonoses listed herein, unless specifically designated to host a pathogen or pathogens. While laboratory animals certified “pathogen free” are indeed considered to be safe, they may still host bacterium or other unknown constituents.

**Hazards and precautions extend not only to the adults and young of the species, but also the eggs, fur, feathers, feces and body fluids.

Chemical Hazard Table

Hazardous Substance	Common Name	Use	Route of Entry	Hazards	Protective Measures
3,3'-Diaminobenzidine	DAB	Research use; tissue staining	Inhalation, oral, skin and eye.	May cause damage to the following organs: kidneys, lungs, bladder, upper respiratory tract, skin, central nervous system.	Use in fume hood or in well ventilated areas with proper PPE - nitrile gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Acetone	Acetone	Solvent; used for cleaning purposes in labs.	Inhalation, oral, skin and eye.	Eye, skin, and respiratory system irritant. May impact multiple body organs.	Use in well ventilated areas with appropriate PPE - gloves, eye protection and lab coat.
Alpha-bungarotoxin	α -BTX	Research use only	Inhalation, oral, and skin	Neurotoxin	Use in fume hood or in well ventilated area with PPE - eyeglasses, lab coat, gloves and respirator if necessary.
Buprenorphine	Buprenex, Butrans, Probuphine, and Belbuca, Butrans, Probuphine, and Belbuca	It is used to treat opioid addiction or acute pain.	Inhalation, oral, skin and eye.	Toxic if swallowed. Eye, skin, and respiratory system hazard. Suspected teratogen.	Nitrile gloves and safety glasses.
Cadmium		Manufacturing and in research such as in lasers and semiconductors	Inhalation, oral, skin.	May cause cancer and genetic defects, harmful if swallowed, skin and respiratory irritant, teratogen.	Use in fume hood. If local exhaust is unavailable and the exposure limit is exceeded, use appropriate respirator, gloves, eye protection, and long-sleeved clothing.
Chlorohexidine diacetate hydrate	Chlorohexidine	Cationic broadspectrum antimicrobial agent	Inhalation, oral, eye, and skin	Irritant - eye, skin, and respiratory system.	Wear protective gloves/protective clothing/eye protection/face protection.

Hazardous Substance	Common Name	Use	Route of Entry	Hazards	Protective Measures
Diethyl Ether	Ether	Solvent	Inhalation, oral, skin and eye.	Extremely flammable; Harmful if swallowed, Eye, skin and respiratory system irritant.	Use in fume hood or in well ventilated areas with proper PPE - gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Dual Quat 256	Dual-Quat and Quat	Disinfectant	Inhalation, oral, skin and eye.	Harmful if swallowed or inhaled. Eye and skin irritant.	Use in well ventilated areas with appropriate PPE - gloves, eye protection and lab coat.
Ethidium Bromide	EtBr	Research - fluorescent tag, staining	Inhalation	Toxic if inhaled. Suspected of causing genetic defects	Use in fume hood or in well ventilated areas with proper PPE - gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Ethyleneimine	Ethyleneimine, Aziridine	Used in DNA research and manufacturing.	Inhalation, oral, skin and eye.	Irritant - eyes, skin, nose, throat; nausea, vomiting; headache, dizziness; pulmonary edema; liver, kidney damage; eye burns; skin sensitization; potential occupational carcinogen	Use in fume hood or in well ventilated areas with proper PPE - nitrile gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hazardous Substance	Common Name	Use	Route of Entry	Hazards	Protective Measures
Ethylene oxide	Oxirane	Disinfectant	Inhalation, oral, skin and eye.	At room temperature it is a flammable, carcinogenic, mutagenic, irritating, and anesthetic gas.	Use in fume hood or in well ventilated areas with proper PPE - nitrile gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Formaldehyde	Formalin	As a preservative and antibacterial agent. It is also used in the manufacture of building materials, etc.	Inhalation, eyes, skin, and oral.	Inhalation toxin; may cause burns to skin and eyes, may cause cancer and damage to organs, may cause genetic defects.	Use in fume hood. If local exhaust is unavailable and the exposure limit is exceeded, use appropriate respirator, gloves and protective clothing.
Formamide	Methanamide	Bio reagent and in manufacturing	Inhalation, oral, skin and eye.	May cause cancer, teratogen, eye and skin irritant; Chronic exposure may cause damage to multiple organs.	Use in fume hood or in well ventilated areas with proper PPE - gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Glacial Acetic Acid	Acetic Acid or ethanoic acid	Research - chemical reagent	Inhalation, oral, skin and eye.	Causes severe eye, skin, digestive and respiratory tract burns. Respiratory effects may be delayed.	Use in well ventilated areas with appropriate PPE - gloves, eye protection and lab coat.

Hazardous Substance	Common Name	Use	Route of Entry	Hazards	Protective Measures
Hydrochloric Acid	Hydrochloric acid or Muriatic Acid	Research - reactions, etc.	Inhalation, oral, skin and eye.	May cause severe burns to skin, eyes, respiratory system, and digestive tract. May be fatal if inhaled.	Use in fume hood or in well ventilated areas with proper PPE - gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.
Isoflurane	Forane, Forene, etc.,	General anesthetic	Respiratory system	Eye and skin irritant. May cause drowsiness or dizziness, headache and nausea. May affect the central nervous system (CNS). Some studies suggest that overexposure may result in adverse reproductive effects.	Use appropriate PPE (nitrile gloves, lab coat, safety glasses or goggles if necessary). Use in fume hoods. If a local exhaust ventilation system is not available, use in a well-ventilated area and with a scavenging system. Leak checks must be routinely performed on scavenging systems.
Ketamine	Ketalar	Anesthetic	Inhalation, oral, skin and eye.	Eye, skin, and respiratory system irritant.	Use in a well-ventilated area with eye protection and gloves.
Methanol	Methyl alcohol	Solvent, fuel, antifreeze, etc.	Inhalation, oral, skin and eye.	May cause blindness if swallowed. May cause significant harm if inhaled. Skin and eye irritant.	Use in fume hood or in well ventilated areas with proper PPE - gloves, eye protection, lab coat, and approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hazardous Substance	Common Name	Use	Route of Entry	Hazards	Protective Measures
Reserpine	Raudixin, Serpalan, Serpasil Raudixin, Serpalan, Serpasil	Antipsychotic, and antihypertensive drug	Inhalation, oral and skin.	harmful if swallowed, inhaled or in contact with skin. Suspected carcinogen and teratogen.	Use in well ventilated areas with appropriate PPE - gloves, eye protection and lab coat.
Sodium Hypochlorite	Bleach	Disinfectant	Inhalation, oral, eye, and skin	Irritant - eye, skin, and respiratory system.	Use in fume hood or in well ventilated area with PPE - eyeglasses, lab coat, gloves and respirator if necessary.
Tricaine Methanesulfonate	Pharmaceutical Grade MS-222 , Tricaine-S, Tricaine Mesylate	Anesthesia and euthanasia of fish, amphibians, and other aquatic coldblooded animals.	Respirable , skin, eyes.	Skin irritation, eye irritation, respiratory toxicity, aquatic toxicity.	Use in well ventilated area, weigh and measure under a fume hood. Avoid contact with mucous membranes. PPE includes nitrile gloves, lab coat and safety glasses.
Trichloromethane	Chloroform	Solvent, reagent	Inhalation, oral, skin and eye.	Carcinogen; teratogen; may impact multiple body organs. Eye and skin irritant.	Use in a well-ventilated area with eye protection and gloves.
Tris(1-Aziridiny)Phosphine Sulfide	Tris(1-Aziridiny)Phosphine Sulfide , Thiotepa	Insect sterilant, and cancer medication	Inhalation, oral, and skin	Carcinogen, teratogen, skin and eye irritant. Chronic exposure may lead to bone marrow damage.	Use in a fume hood or with respiratory protection. Use gloves, eye protection, and lab coat.
Tris(2,3-dibromopropyl) phosphate	Tris(2,3dibromopropyl) phosphate	Research use, and flame retardant	Skin, oral, and inhalation	May cause cancer, harmful if swallowed, skin irritant, toxic to aquatic life.	Wear protective gloves/protective clothing/eye protection/face protection. Proper ventilation or local exhaust should be considered.

Hazardous Substance	Common Name	Use	Route of Entry	Hazards	Protective Measures
Xylazine	Rompun, Anased, Sedazine, Chanazine, Anased, Sedazine, Chanazine	Anesthetic	Inhalation, oral, skin and eye.	Toxic if swallowed. Eye, skin, and respiratory system irritant.	Use process enclosures or in well ventilated areas with appropriate PPE - gloves and eye protection.

Non-Animal Laboratory Hazards

Item	Examples	Potential Risk
Latex	Gloves, masks	Allergies
Freund's complete adjuvant		Can cause sensitization to TB
Steam/hot water	Used extensively for sanitation and sterilization	Can cause severe thermal burns
Chemicals	Detergents, acidic de-scaling agents, alcohol, cleaning products, flammables	Can cause chemical burns or toxicity
Pharmaceuticals	Anesthetics, antibiotics, analgesics, tranquilizing agents, test drugs	Can be toxic
Heavy items	Lifting feed bags, caging, animals	Can cause lifting injuries
Wet floors	Mopping floors and cleaning labs or animal housing facilities	Slipping and falling
Carcinogens, mutagens, teratogens, and other hazardous test substances	Cancer-causing agents, spills	Agents can cause genetic mutation; disruption of normal cellular development in an embryo or fetus
Biological toxins	Poisons and venoms	Agents capable of causing illness and/or death
Ultraviolet (UV) light	Germicidal lamps, outdoor work	Can damage eyes and skin
Sharps	Needles, scalpels, broken glass	May produce physical damage
Infectious agents	<i>E. coli</i> , <i>Salmonella</i> , parasites, Hanta virus, rabies	Risk of infection and illness
Husbandry	Cleaning bedding, cages	Exposure to contaminated bedding, waste
Flammable materials	Chemicals, bedding, paper towels and gowns	Burns, property damage
Pressure vessels	Compressed-gas cylinders, high pressure washing equipment	Risk of explosion and personal injury
Lasers	Lasers	Eye damage due to viewing; burns
Electricity	Electrical hazards are present wherever electric current is present; absence of plate on wall socket; frayed or exposed wires	Electric shocks, burns
Ionizing radiation	Using radioisotopes in research animals, X rays, gamma rays	Exposure to radiation
Noise	Working in a loud environment with machinery and animal noise	Hearing damage, loss of concentration, distraction
Machinery	Excessive noise; dangerous equipment	Hearing damage; injury
Ergonomic hazards	Heavy and repeated lifting (of cages, large animals), pinch points	Risk of injury

APPENDIX D – FIELD HEALTH AND SAFETY PLAN FORM

FAU Field Research Health and Safety Plan

Complete this form and submit to the EH&S Laboratory Safety Officer prior to work on the associated project in the field. Utilize Appendix E of Animal Research Health and Safety Plan for evaluation of hazards to complete this form. Contact Josanne Hollingsworth-Maida, LSO at EH&S for consultation on completion of this HASP as needed.

SECTION 1 – Information on Principle Investigator and Research Team

Name of PI	PI Cell #:	Fieldwork Location(s):
Names of Employees/Students participating in Fieldwork:	Project Name:	Associated IACUC Protocols and IBC Registrations for the work:

SECTION 2 – Information on Field Work and Intentional Hazards Expected

Description of Field Work:
Description of Intentional Animal Encounters, if any:
Description of Intention Hazardous Encounters, if any:

SECTION 3 – Potential Hazards and Control Measures

Potential Hazard	Control Measure or NA
Off road vehicles	

Potential Hazard	Control Measure or NA
Water Hazards	
Boating	
Diving	
Fall Hazards	
Underground Hazards	
Uneven Terrain	
Dangerous Tools, Equipment, Weapons	
Use of Hazardous Chemicals	
Aircraft	
Wilderness	
Parasites and Disease Hazards	
Other Potential Physical Hazards	
Research Overseas	
Special Considerations for Host Country	

SECTION 4 – Training and Authorizations

Item	Detail or NA
Members of the Fieldwork Team Trained in Working Safely with Animals and Animal Fieldwork Safety through EH&S.	
Members of the Fieldwork Team Trained in First Aid/CPR	
Members of the Fieldwork Team authorized to operate boats, if any.	
Members of the Fieldwork Team authorized for scientific diving, if any.	

SECTION 4 – Emergency Action Plan

Item	Detail
Closest Emergency Medical Care to Fieldwork Site(s)	
Cell coverage available at the fieldwork location or satellite phone will be used (list all applicable)	

Signature of PI: _____

APPENDIX E – FIELDWORK HAZARD TABLES

General Fieldwork Hazard Table

Hazard	Location	Cause	Symptoms	First Aid	Prevention
Vehicle Accidents	Worldwide	<ul style="list-style-type: none"> -Fatigue -Impaired driving -Driver error -Roadway factors -Vehicle factors 	<ul style="list-style-type: none"> -Various trauma injuries 	<ul style="list-style-type: none"> -Call 911 -Secure the scene -Do not move victim -Check airways, breathing and circulation -Treat specific injury 	<ul style="list-style-type: none"> -Obey traffic laws -Wear your seatbelt -Don't drive impaired -Don't speed or drive recklessly -Don't use a 12 or 15 passenger van
Slips, trips and falls	Worldwide	<ul style="list-style-type: none"> -Loose, irregular or slippery surface -Wrong footwear -Poor lighting -Obstruction -Improper (or lack of) use of ladders -Inattention or distraction 	<ul style="list-style-type: none"> -Strains, fractures, bruises and contusions (head, wrist, elbow, shoulder, back, hip, knee, ankle) 		<ul style="list-style-type: none"> -Proper "housekeeping" -Wear proper footwear -Adequate lighting -Don't carry oversized objects -Use ladders properly
Dehydration	Worldwide	<ul style="list-style-type: none"> -Not enough water intake 	<ul style="list-style-type: none"> -Increased thirst -Dry mouth -Flushed face -Dizziness -Headache -Weakness -Muscle cramps -Dark urine 	<ul style="list-style-type: none"> -Drink plenty of fluids -Take frequent rest breaks -Minimize caffeinated beverage intake 	<ul style="list-style-type: none"> -Drink plenty of water (at least 2 quarts per day), more if working strenuously or in a warm climate
Impure Water	Worldwide	<ul style="list-style-type: none"> -Harmful organisms and pathogens living in water sources 	<ul style="list-style-type: none"> -Gastrointestinal illness -Flu-like symptoms 	<ul style="list-style-type: none"> -Drink clear liquids (uncontaminated) -Slowly introduce mild foods, e.g., rice, toast, crackers, bananas, or 	<ul style="list-style-type: none"> -Carry your own water -Treat water before use with tablets, purifiers, or by boiling for > 3 minutes -Use
Sunburn	Worldwide	<ul style="list-style-type: none"> -Excessive exposure to the sun 	<ul style="list-style-type: none"> -Irritated skin, pink or red in color 	<ul style="list-style-type: none"> -Apply cool water, aloe or other cooling lotion to affected area 	<ul style="list-style-type: none"> -Wear long sleeved clothing and a hat -Apply SPF ≥30 sunblock
Heat Exhaustion	Worldwide – hot climates	<ul style="list-style-type: none"> -Prolonged physical exertion in a hot environment 	<ul style="list-style-type: none"> -Fatigue -Excessive thirst -Heavy sweating -Cool, clammy skin 	<ul style="list-style-type: none"> -Cool the victim, treat for shock, and slowly give water or electrolyte replacer 	<ul style="list-style-type: none"> -Acclimate to heat gradually -Drink plenty of liquids -Take frequent rest breaks
Heat Stroke	Worldwide – hot climates	<ul style="list-style-type: none"> -Prolonged physical exertion in a hot environment 	<ul style="list-style-type: none"> -Exhaustion -Light-headedness -Bright red warm skin 	<ul style="list-style-type: none"> -Cool the victim at once, replenish fluids, and seek medical attention immediately 	<ul style="list-style-type: none"> -Acclimate to heat gradually -Drink plenty of liquids -Take frequent rest breaks

Hazard	Location	Cause	Symptoms	First Aid	Prevention
Frostbite	Worldwide – cold climates	Exposure to cold temperatures	-Waxy, whitish numb skin -Swelling, itching, burning, and deep pain as the skin	Slowly warm the affected areas (do NOT rub area) and seek medical attention immediately	-Dress in layers -Cover your extremities with warm clothing, e.g., hats, facemask, gloves, socks, and shoes
Hypothermia	Worldwide – cold climates	Prolonged exposure to cold temperatures	-Shivering -Numbness -Slurred speech -Excessive fatigue	Remove cold wet clothes, put on dry clothes or use a blanket or skin-to-skin contact, drink warm liquids, seek medical	-Dress in layers -Wear appropriate clothing -Avoid getting damp from perspiration
Carbon Monoxide	Worldwide	Running a vehicle or burning a fuel stove in an enclosed space	-Severe headaches -Disorientation -Agitation -Lethargy -Stupor	Remove the victim to fresh air immediately and perform CPR if needed	-Keep areas adequately ventilated when burning fuel -Ensure that vehicle tailpipe is not covered by snow
Extreme Weather	Worldwide	Snow squalls, blizzards, heavy rains, lightning, tornadoes, hurricanes	Severe weather can result in physical injury and/or death	Seek shelter immediately	-Be aware of special weather concerns -Bring appropriate equipment to deal with severe weather
High Altitude Illness	Worldwide – high altitudes	Decreased oxygen intake and increased breathing rate	-Headache -Nausea -Weakness	Use supplemental oxygen and decrease altitude	-Allow your body to acclimatize by gaining elevation slowly
Hunting Season	United States	Local hunting seasons and regulations vary	-A hunting accident may result in serious injury or death	Seek medical attention for serious injuries or wounds	-Wear appropriately colored safety clothing -Avoid animal like behavior (e.g. hiding in thickets)
Poison Plants	North America	Exposure to poison ivy, poison oak, or poison sumac plants	-Itchy rash -Red, swollen skin	Apply a wet compress with baking soda or vinegar or use a topical ointment. Avoid scratching the rash.	-Avoid contact with poison plants -Use pre-exposure lotion -Wash clothes and skin with soap and water after exposure
Violence caused by political unrest or military conflict	International	N/A	N/A	N/A	Leave the area as soon as it is safe to do so. Be aware of current travel advisories.
Theft	International	N/A	N/A	N/A	Report theft immediately to local authorities. Keep Wallet in front pocket at all times. Carry shoulder bag diagonally and keep bag in front under arm.

Animals and Other Indigenous Species Table

Type	Location	Most Dangerous Species	What to do if encountered	First Aid	Prevention
Mosquitoes	Worldwide – especially wet areas conducive to breeding	Refer to Section V: Diseases		Use topical ointment to relieve itching	-Use insect repellent -Don't leave standing pools of water -Use bed nets
Rodents	Worldwide		Don't touch a rodent, dead or alive	Clean wounds thoroughly if bitten or scratched	-Keep areas clean to avoid attracting rodents -Store food in sealed containers
Conenose "Kissing" Bugs	North and South America	May cause allergies in some people. In Latin America they sometimes carry a protozoan, <i>Trypanosoma cruzi</i> , which causes Chagas' disease Refer to Section V: Diseases		Use topical ointments to sooth itching. Seek medical attention immediately in case of anaphylactic shock.	-Use caution when working near nests and wood rat dens -Use extra caution when working near rock shelters
Sharks	Worldwide – Oceans – U.S., Africa, Central and South America, Australia, Pacific Islands	Great White, Bull, Tiger, Oceanic Whitetip	Call for help, swim towards safety, punch or kick the shark if necessary	Seek medical attention for serious injuries or wounds	-Never swim alone -Don't wear sparkling jewelry -Don't enter the water when bleeding
Crocodiles and Alligators	Worldwide – tropics and subtropics – North America, Australia, Africa, Eastern China	American Alligator (North America), Estuarine Crocodile (Australia), Nile Crocodile (Africa)	Do not provoke an alligator or crocodile	Seek medical attention for serious injuries or wounds	-Avoid waters known to be home to crocodiles or alligators -Keep at least 30 feet away from any crocodile or alligator
Mountain Lions	North, Central, and South America	All	-Do not run, back away slowly, do not corner it - Do not play dead, look it in the eyes -Make yourself look larger (arms overhead), do not bend down -Use a loud voice -Throw sticks or rocks -Fight back, poke it in the eye with your thumb -Protect your neck and head	Seek medical attention immediately for serious injuries or wounds	-Do not leave children or pets unattended -Do not feed deer -Avoid hiking, biking, jogging alone or other outdoor activities when mountain lions are most
Other Large Land Dwellers	Africa, Asia	Hippos, African Elephant, Rhinos, and Buffalo (Africa); Asian Elephants and Bengal Tigers (Southeast Asia); Siberian Tigers (North and East Asia)	-Do not startle	Seek medical attention immediately for serious injuries or wounds	-Stay inside the vehicle if travelling near large animals -Do not camp near areas frequented by large animals -Keep a look out in open spaces -Do not provoke

Type	Location	Most Dangerous Species	What to do if encountered	First Aid	Prevention
Water Dwellers	Worldwide (especially Australia)	Blue Ringed Octopus, Box Jellyfish, and Irukandji Jellyfish (Australia); Stonefish (worldwide)	Never touch an unidentified octopus or jellyfish	-Jellyfish/ Octopus sting use vinegar on wound -Stonefish sting rinse with warm water -Seek medical attention	-Avoid going in waters known to be inhabited by jellyfish and octopus -Wear sandal in the water to avoid stepping on a stonefish
Bears	Worldwide (Arctic, North America, South America, Asia)	Black Bear (North America), Grizzly Bear (Alaska, Western Canada, Pacific Northwest), Polar Bear (Arctic), Polar Bears (Greenland and North Russia), Spectacled Bears (North and West South America), Asiatic Black Bears (South and East Asia)	-Do not run -Move slowly and speak in a low soft voice -If attacked, lay in the fetal position and protect head -Play dead	Seek medical attention immediately for serious injuries or wounds	-Keep food out of sleeping areas -Never approach a bear (or bear cub) -Wear a bell or other noisemaker -Stay away from the bear's food supply
Lions	Africa and Asia	All	-Do not startle -Do not run -Do not look it in the eye -Make yourself look larger	Seek medical attention immediately for serious injuries or wounds	-Stay inside the vehicle if travelling near lions -Do not camp in areas frequented by lions -Do not sleep outside -Do not provoke
Snakes	Worldwide, North America, Mexico	Rattlesnakes, Cottonmouths, Coral Snakes, Moccasins, and Copperheads Russel's Viper, Indian Cobra (India); Tiger, Black, Brown, Sea Snakes (Australia); Egyptian Cobra, Puff Adder, Saw Scaled Viper (Africa); Fer-de-lance (Central and South America)	-Do not pick up, disturb, or corner it -Move away from the snake -Avoid locations where snakes may be	-Let the wound bleed freely for 30 seconds -Apply a cold pack -Keep area immobilized at heart level -Seek medical attention immediately (alert ahead if possible)	-Walk in open areas -Wear heavy boots -Use a stick to disturb the brush in front of you
Spiders	Worldwide North America	Funnel Web and Redback Spiders (Australia); Brazilian Wandering Spider, Brown Recluse, and Tarantula (South America) Black Widow and Brown Recluse	-Do not pick up or disturb a spider -Avoid locations where spiders may be such as dark places	-Clean wound -Apply a cold pack -Keep area immobilized at heart level -Seek medical attention immediately (alert ahead if possible)	-Use care around rock piles, logs, bark, gardens, outdoor privies, old buildings -Wear gloves when working outside -Shake out clothing and bedding before use
Scorpions	North America – especially Arizona, Southeast California, Utah and Mexico Worldwide (especially North Africa, The Middle East, South America, and India)	All	-Do not pick up or disturb a scorpion -Avoid locations where scorpions may be - Keep area immobilized at heart level - If needed use painkiller or	-Clean wound -Apply a cold pack	-Shake out clothing and bedding before use -Avoid lumber piles and old tree stumps -Wear gloves when working outside

Type	Location	Most Dangerous Species	What to do if encountered	First Aid	Prevention
			antihistamine -Seek medical attention if no signs of improvement		
Bees, Wasps, etc.	North America	Bees, wasps, hornets, and yellowjackets, Africanized Killer Bees (Southeast United States)	-Avoid wearing bright colors, flower prints and perfume -Move slowly or stand still (don't swat at insects)	-Remove the stinger -Apply a cold pack -Keep area immobilized at heart level - If needed use painkiller or antihistamine	-Bring medication if you have an allergy (the sting may be fatal) -Keep scented foods, drinks and meats covered -Wear shoes outside
Fleas and Ticks	North America	Refer to Section V: Diseases	-Avoid shrubbery -Stay on widest part of path	-Remove the flea or tick with tissue or tweezers -Clean wound with antiseptic -Pay attention for signs of illness (see Section V: Diseases) and seek medical attention if needed	-Wear long clothing with tightly woven material -Wear insect repellent -Tuck pants into boots -Drag cloth across campsite to check for fleas/ticks -Protect pets

Diseases Table

Type	Location	Exposure Route	Symptoms	First Aid	Prevention
Campylobacteriosis	Worldwide	Foodborne – poultry products, unpasteurized milk or water contaminated with <i>Campylobacter</i>	-Diarrhea - Gastrointestinal symptoms -Fever	-Drink plenty of fluids -Seek medical attention if symptoms persist	-Always cook food thoroughly -Never drink water from an impure source -Do not drink unpasteurized milk -Wash hands with soap and water frequently
Cholera	Africa, Asia, Latin America	Foodborne – food and water contaminated with <i>Vibrio cholerae</i>	-Diarrhea - Gastrointestinal symptoms	-Drink plenty of fluids -Seek medical attention if symptoms persist	-Always cook food thoroughly -Never drink water from an impure source -Wash hands with soap and water frequently
<i>E. coli</i> O157:H7 and Shiga toxin-producing <i>E. coli</i> Gastroenteritis	Worldwide	Foodborne – beef, unpasteurized milk, unwashed raw vegetables, water	-Diarrhea - Gastrointestinal symptoms	-Drink plenty of fluids -Seek medical attention if symptoms persist	-Always cook food thoroughly -Wash vegetables before consuming -Never drink water from an impure source

Type	Location	Exposure Route	Symptoms	First Aid	Prevention
Hepatitis A (Vaccine Available)	Worldwide (under-developed countries)	Foodborne – water, shellfish, unwashed raw vegetables contaminated with Hepatitis A virus	-Diarrhea - Gastrointestinal symptoms	-Drink plenty of fluids (bottled or purified water – not local water) -Seek medical attention if symptoms persist	-Obtain a vaccine -Always cook food thoroughly -Wash vegetables before consuming -Never drink water from an impure source -Wash hands with soap and water frequently
Histoplasmosis	Worldwide (especially Miss. and Ohio River Valleys)	Inhalation of fungus <i>Histoplasma capsulatum</i> from soil contaminated with bat or bird	-Mild flu-like -Rarely can be acute pulmonary histoplasmosis	-See a doctor if you suspect histoplasmosis -Typically clears up in 3 weeks	-Use caution when disturbing dry soils or working near bat or bird droppings -Personal protective equipment may be needed
Human Immunodeficiency virus/ Acquired Immune Deficiency Syndrome (HIV/AIDS)	Worldwide	-Being exposed to blood or body fluids infected with HIV -Having sex or sharing needles with someone infected with HIV	-May have flu-like symptoms 14-60 days post infection -Attacks the immune system, may eventually result in opportunistic infections or cancers	-None - Blood test for diagnosis -Treatment with antiretroviral drugs for long	-Follow Bloodborne Pathogen training when handling any unfixed human blood or tissue -Do not engaging in risky activities
Seasonal Flu	Worldwide Note: As of 2008, Pandemic Strains of Influenza (not seasonal) have been reported in Africa, Asia, Europe, Near East and occur primarily in birds	-Inhalation of influenza virus -Contact with birds infected with influenza	-Fever (usually high) -Headache -Extreme tiredness -Dry cough -Sore throat -Runny or stuffy nose -Muscle aches -Stomach symptoms (nausea, vomiting, diarrhea) more commonly in children	-Flu antiviral drugs can treat the flu or prevent infection -Your health care professional will decide whether you should take antiviral drugs -Antiviral drugs should be started within 48 hours of getting sick -Antiviral drugs are 70% to 90% effective in preventing infection	-Annual flu vaccination -Cover your nose and mouth with a tissue or your elbow when you cough or sneeze -Wash hands with soap and water frequently -If you are not near water, use an alcohol-based hand cleaner -Try not to touch your eyes, nose, or mouth. -Stay away from people who are sick -If you get the flu, stay home from work or school
Leptospirosis	Worldwide	Ingestion, swimming, or other activities in water contaminated with <i>Leptospira</i>	-Flu-like -Occasionally more serious symptoms	-See a doctor if you suspect leptospirosis	-Use care when working in the water, especially after a flooding event -Avoid entering the water with open wounds
Norovirus “Norwalk-like viruses” (NLV) Gastroenteritis	Worldwide	Foodborne - food, water, surfaces or objects contaminated with Norovirus -Direct contact	Nausea, vomiting, diarrhea, stomach cramping -Some people also have a low-grade fever, chills, headache, muscle aches, malaise	Stay hydrated	-Wash hands with soap and water frequently -Wash fruits/vegetables, and steam oysters -Clean and disinfect contaminated surfaces immediately after illness using a bleach-based cleaner -Remove and wash contaminated

Type	Location	Exposure Route	Symptoms	First Aid	Prevention
Plague	Worldwide	Flea-borne - from rodents infected with <i>Yersinia pestis</i> to humans -Direct contact with infected tissues or fluids from sick or dead animals	-Flu-like -Non-specific -Swollen and painful lymph nodes (bubonic)	See a doctor if you suspect plague	-Use care when working in areas where plague is found -Use caution when working with wild rodents
Rabies (Vaccine Available)	Worldwide	-Infection from bite of an animal (e.g., raccoons, skunks, bats, foxes, coyotes, dogs, cats) infected with <i>Lyssavirus</i>	-Fatal (within days of the onset of symptoms) without immediate treatment -Early symptoms: fever,	Disinfect and wash the wound. See a doctor IMMEDIATELY if potentially exposed to a rabies-carrying species (e.g.,	-Obtain a vaccine if you will be working with bats or carnivores -Use extreme caution handling these animals -Vaccinate pets
Salmonellosis	Worldwide	Foodborne – beef, poultry, milk, eggs, unwashed raw vegetables contaminated with salmonella bacteria	-Diarrhea -Gastrointestinal symptoms	-Drink plenty of fluids -Seek medical attention if symptoms persist	-Always cook food thoroughly -Wash vegetables before consuming -Wash hands with soap and water frequently
Typhoid Fever (Vaccine Available)	Worldwide	Foodborne – food and water	-Diarrhea -Gastrointestinal symptoms	-Drink plenty of fluids -Seek medical attention if symptoms persist	-Obtain a vaccine -Always cook food thoroughly -Never drink water from an impure source -Wash hands with soap and water frequently
Tetanus (Vaccine Available)	Worldwide	A wound that is infected with <i>Clostridium tetani</i> ; tetanus toxin is produced by the bacteria and attacks nerves	-Early symptoms: lockjaw, stiffness in the neck and abdomen, difficulty swallowing -Later symptoms: muscle spasms, seizures, nervous system disorders	-See a doctor for any wound contaminated with dirt, feces, soil, or saliva; for puncture wounds; and for wounds resulting from crushing, burns, and frostbite	-Obtain a vaccine for tetanus every 10 years or immediately following a suspect wound or injury -Once the disease starts it must run its course
Typhus Fever	Worldwide	Infection from bite of lice, fleas, ticks, or mites infected with <i>Rickettsiae</i> species	-Headache -Fever -Rash	-See a doctor if you suspect Typhus Fever -Treatable with antibiotics	-Use insect repellent -Wear long sleeve shirts -Tuck pants into boots

Type	Location	Exposure Route	Symptoms	First Aid	Prevention
Coccidiomycosis "Valley Fever"	North and South America semi-arid regions	<i>Coccidioides</i> species fungus is inhaled when soil is disturbed	-None in most people ~60% -Flu-like (fever, cough, rash, headache, muscle aches) -Occasionally, chronic pulmonary infection or widespread disseminated infection (skin lesions, central nervous system infection, and bone and joint infection)	-See a doctor if you suspect Valley Fever	-Wet soil before digging - If you are immunocompromised, wear a mask when digging -Stay inside during dust storms in areas where <i>Coccidioides</i> fungus is present -Keep doors and windows tightly closed
St. Louis Encephalitis	North and South America	-Mosquito-borne - infection from bite of a mosquito infected with <i>St. Louis Encephalitis virus</i>	-Mild - fever and headache -Severe - headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and rarely death	Seek medical attention immediately if you suspect encephalitis	-Use insect repellent -Many mosquitoes are most active at dusk and dawn, consider staying indoors during these hours -Wear long sleeves and pants -Avoid areas of standing water where mosquitoes breed
Lyme Disease	United States, Europe and Asia	Infection through the bite of a tick infected with <i>Borrelia burgdorferi</i> (U.S.) <i>Borrelia afzelii</i> or <i>Borrelia garinii</i> (Europe)	-Spreading rash ("bullseye") -Early symptoms: flu-like -Later symptoms: arthritis and neurologic problems	See a doctor if you suspect Lyme Disease	-Avoid tick infested areas -Wear long sleeves and pants -Use insect repellent -Check clothing and hair for ticks and remove any ticks
Rocky Mountain Spotted Fever	United States, southern Canada, Mexico, and Central America	Infection through the bite of an infected tick - <i>Rickettsia rickettsii</i>	-Sudden onset of fever -Headache -Muscle pain -Spotty rash	See a doctor if you suspect Rocky Mountain Spotted Fever	-Avoid tick infested areas -Wear long pants, shirts -Use a repellent -Check clothing and hair for ticks and remove any ticks

Type	Location	Exposure Route	Symptoms	First Aid	Prevention
Hantavirus Pulmonary Syndrome (HPS) – Sin Nombre Virus	North America	Inhalation of dusts or aerosols from the infected rodent's feces, urine, or saliva -Vector: Deer mouse (<i>peromyscus maniculatus</i>)	-(Early, 1-5 weeks) fatigue, fever, muscle aches, chills, headaches, dizziness, sometimes abdominal problems -(Late, 4-10 days after early) coughing, shortness of breath	Seek medical attention IMMEDIATELY if you suspect HPS. The likelihood of survival is greatly increased with early diagnosis and treatment	-Avoid contact with rodents, especially their feces -See section on dealing with rodent infested areas
Arenavirus (White Water Arroyo)	North America	Inhalation of dusts or aerosols from the infected rodent's feces, urine, or saliva -Vector: Woodrats (<i>Neotoma fuscipes</i>) and other <i>Neotoma</i> species	-Fever -Headache -Muscle aches -Severe respiratory distress (occasionally)	Seek medical attention IMMEDIATELY if you suspect WWA. The likelihood of survival is greatly increased with early diagnosis and treatment	-Avoid contact with rodents, especially their feces -See section on dealing with rodent infested areas
West Nile Virus	North America	-Mosquito-borne - Infection from the bite of a mosquito infected with West Nile Virus -Handling infected birds	-None in most people ~80% -Mild - fever, headache, body aches, nausea, vomiting, and sometimes swollen glands or a rash on the chest, stomach and back; -Severe - high fever, neck stiffness, stupor, muscle weakness, disorientation, coma, tremors, convulsions, vision loss, numbness.	See a doctor if you suspect that severe symptoms are due to West Nile Virus	-Use insect repellent -Many mosquitoes are most active at dusk and dawn, consider staying indoors during these hours -Wear long sleeves and pants -Avoid areas of standing water where mosquitoes breed -Don't handle dead birds with your bare hands
Dengue Fever	Africa, Southeast Asia, China, India, Middle East, South and Central America, Australia and the Pacific Islands	-Mosquito-borne - Infection from the bite of a mosquito infected with 1 of 4 dengue viruses	-Flu-like -Sudden, high fever -Severe headache -Pain behind eyes -Nausea/vomiting -Rash	-See a doctor if you suspect Dengue Fever -Takes up to 1 month to recover	-Wear long sleeves and pants -Use insect repellent -Use a mosquito net

Type	Location	Exposure Route	Symptoms	First Aid	Prevention
Malaria (Preventable with Drugs)	Central and South America, Hispaniola, Africa, India, South Asia, Southeast Asia, the Middle East, and Oceania	-Mosquito-borne - Infection from the bite of an infective female Anopheles mosquito -Blood transfusion -Contaminated needles/syringes	-May take 10 days to 1 year for symptoms to appear -Flu-like, fever, sweats, chills, headache, malaise, muscle aches, nausea, vomiting, jaundice -Untreated may cause severe complications including death	-See a doctor IMMEDIATELY if you have traveled in a malaria-risk area and suspect malaria	-Use a mosquito net -Use insect repellent -Take Antimalarial drugs (visit your health care provider 4-6 weeks before travel) -Wear long sleeves and pants
Severe Acute Respiratory Syndrome (SARS)	Occurred in 2003 in North America, South America, Europe, and Asia	-Close person-to- person contact -Inhalation of respiratory droplets produced when an infected person coughs or sneezes -Touching surface or object contaminated with infectious droplets and then touch mouth, nose, or eye(s)	-Begins with a high fever (>100.4°F [38.0°C]) -Headache -Malaise -Some have mild respiratory symptoms at the outset -10- 20% have diarrhea -After 2 to 7 days may develop a dry cough -Most develop pneumonia		-Wash your hands with soap and water frequently or an alcohol-based hand rub -Travelers to China should avoid live food markets and contact with civets and other wildlife (no evidence that direct contact with civets has led to cases of SARS, similar viruses have been found in these animals)
Yellow Fever (Vaccine Available)	South America and Africa	-Mosquito-borne - Infection from the bite of a mosquito infected with Yellow fever virus	-Flu-like -Jaundice -Can be fatal	See a doctor if you suspect Yellow Fever	-Visit doctor at least 10 days before travel for vaccine -Wear long sleeve shirts and pants -Use insect repellent -Use a mosquito net
Hantavirus (Sin Nombre Virus) and Arenavirus (White Water Arroyo)	Central and South America and Asia	-Inhalation of dusts or aerosols from the infected rodent's feces, urine, or saliva -Vector: Rodents; especially Neotoma and Peromyscus species	-Fever -Headache -Muscle aches -Severe respiratory distress (occasionally)	Seek medical attention IMMEDIATELY if you suspect hanta or arenavirus. The likelihood of survival is greatly increased with early diagnosis and treatment	-Avoid contact with rodents, especially their feces -See section on proper rodent handling for cleaning a rodent infested area

Type	Location	Exposure Route	Symptoms	First Aid	Prevention
Schistoso- miasis, (or bilharzias)	Brazil, Egypt, sub- Saharan Africa, southern China, the Philippines, and Southeast Asia	Transmitted by swimming in contaminated fresh water	-Can be asymptomatic -(Acute: 2-3 weeks) Fever, weight loss, weakness, cough, headaches, abdominal, joint and muscle pain, diarrhea, nausea -(Chronic) disease in lungs, liver, intestines, bladder	See a doctor if you suspect schistomiasis	-Avoid fresh-water wading or swimming in endemic regions -Heat bath water over 50°C for at least 5 minutes before use