USC University of Southern California

FIELD RESEARCH SAFETY PLAN

Office of Environmental Health & Safety

INSTRUCTIONS

A Field Research Safety Plan is a guide created by the research team that: (a) identifies and assesses hazards with field research, (b) establishes lines of communication, (c) describes emergency procedures, and (d) details required safety training for research staff. To create a Field Research Safety Plan specific to your research, follow the instructions below.

1. Complete this safety plan. Insert specifics for your site and operations.
2. Complete training for your site and operations (e.g., first aid, heat illness prevention, and task-specific training).
3. Obtain immunizations and prophylaxis for your destination, if applicable (schedule 8 weeks in advance).
4. Hold a pre-trip meeting with your group and/or supervisor to review your field safety plan, travel logistics, pack list (including first aid kit), personal safety and security concerns, and any remaining training needs.
5. If the research is overseas, visit USC's International Research web page for information.

BACKGROUND INFORMATION

Research Project or Course	
Research Team	
Date(s) of Travel	

SITE INFORMATION

Field Site Name	
Field Site Location	*Longitude:* *Latitude:*
Terrain/Environment	
Site Access	
Domestic/ International Activities[1]	
Environmental Hazards	
Security	
Drinking Water Availability	*Plumbed water* ☐ *Natural source and treatment methods (e.g., filtration, boiling, or chemical disinfection)* ☐ *Bottled water* ☐ *Water cooler with ice* ☐ *NOTE: Online Heat Illness Prevention training is available via Trojan Learn (search using the keyword "heat"; course length is 20 minutes).*
Access to Shade/ Shelter[2]	*Building structures* ☐ *Trees* ☐ *Temporary canopy/tarp* ☐ *Vehicle with A/C* ☐ *Other (describe)* ☐ *NOTE: If forecast exceeds 80°F, shade must be provided by natural or artificial means for rest breaks.*
High Heat Procedures[2]	*Required when temperatures are expected to exceed 95°F: If possible, limit strenuous tasks to morning or late afternoon hours. Rest breaks in shade must be provided at least 10 minutes every 2 hours (or more if needed). Effective means of communication, observation, and monitoring for signs of heat illness are required at all times. Pre-work safety discussion required. Direct supervision* ☐ *Buddy system* ☐ *Reliable cell phone or radio contact* ☐ *Other (describe)* ☐

[1] *Check with the Office of International Services regarding required approvals (e.g., visas, permits, and import/export controls). Contact the Office of Ethics and Compliance or Office of Research for further guidance.*

[2] *Review Heat Illness Prevention for Supervisors Fact Sheet and Heat Illness Prevention Fact Sheet on Pages 4 and 5, respectively.*

EMERGENCY SERVICES / CONTACT INFORMATION	
Local Contact	
University Contact	
Emergency Medical Services	
Nearest Emergency Medical Facility	
Mobile Phone Coverage	*List primary mobile phone number:* *Coverage is: Good* ☐ *Spotty* ☐ *Not Available* ☐ *Satellite phone/device:* *Device carried? Yes* ☐ *No* ☐
Nearby Facilities	
Side Trips	
PARTICIPANT INFORMATION	
Field Team/ Participants	*Name and phone of Primary Field Team Leader:* *Name and phone of Secondary Field Team Leader:* *Field Team/Participant list is attached as training documentation* ☐ *Other attachment (e.g., course roster)* ☐
Physical Demands	
Mental Demands	
First Aid Training & Supplies[3]	
Immunization or Medical Evaluation	

[3] *Review First Aid Kits Guide Sheet on Page 6.*

EQUIPMENT / TRANSPORTATION	
Research Tools	
Other Research Hazards[4]	
Personal Protective Equipment (PPE)	
Field Transportation and Insurance	
CAMPUS CONTACTS	
Department of Public Safety	*(213) 740-4321 UPC; (323) 442-1000 HSC* *https://dps.usc.edu*
EH&S	*(323) 442-2200 https://ehs.usc.edu; report injuries - injuryprevention@usc.edu*
Student Health Services	*(213) 740-9355* *https://studenthealth.usc.edu*
USC Travel Emergency Assistance	*(213) 740-8258, (800) 348-7454 Office of Ethics and Compliance* *213.354.5000, 215.942.8226, or phlopsmed@internationalsos.com* *International SOS is USC's contracted health and safety emergency provider for overseas programs.*

APPENDIX

- Heat Illness Prevention for Supervisors Fact Sheet
- Heat Illness Prevention Fact Sheet
- First Aid Kits Guide Sheet
- Common Disinfectants for the Laboratory
- General Guidelines for Fieldwork Involving Trapping and Handling Wild Rodents

[4] *Refer to General Guidelines for Fieldwork Involving Trapping and Handling Wild Rodents on page 7.*

FactSheet Heat Illness Prevention for Supervisors

Cal/OSHA's Heat Illness Prevention Regulation (CCR Title 8, §3395) states that as a supervisor, you are required to take certain steps to protect employees from heat illness, especially when they are working outside. Review the checklist outlined below.

CHECKLIST

1. Water Availability

- ☐ Plenty of fresh, pure, and suitably cool water is located as close as is practical to where the employees are working.
- ☐ A plan is in place to refill water coolers throughout the day.

2. Shade and Rest

- ☐ A shade structure is always available for employees to rest and cool down (regardless of the weather).
- ☐ The weather forecast is known and current weather is monitored.

3. Safety Training

- ☐ All employees are trained to recognize and prevent heat illness BEFORE they start working outdoors.
- ☐ All employees can identify symptoms of heat illness.
- ☐ A plan is in place to acclimate new employees.

4. Emergency Plan

- ☐ Everyone knows how to contact DPS.
- ☐ Employees can explain their location if they need to call DPS.
- ☐ Employees are trained to look out for each other.

5. Reminders - The employees are instructed to:

- ☐ Drink water frequently (at least every 15 minutes).
- ☐ Rest in the cool shade during breaks and as needed.

AS A SUPERVISOR, YOU MUST:

- Ensure the availability of water.
- Provide a ready shade structure.
- Train your employees.
- Have an emergency plan ready.
- Contact EH&S at (323) 442-2200 if you have any questions/concerns.
- For all emergencies: Contact DPS (213) 740-4321 UPC; (323) 442-1000 HSC; local emergency service provider; or 911.

ADDITIONAL INFORMATION

Heat Safety - Supervisor's Daily Checklist PDF:
http://www.99calor.org/_downloads/Employers_training_Kit/daily_checklist_english.pdf

http://www.99calor.org/_downloads/Employers_training_Kit/daily_checklist_spanish.pdf

Cal-OSHA Heat Illness Prevention:
http://www.dir.ca.gov/dosh/heatillnessinfo.html

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05/2020

FactSheet Heat Illness Prevention

Heat illness is a serious medical condition resulting in the body's inability to cope with a particular heat load. The health effects include heat cramps, heat exhaustion (excessive loss of water and salt), and heatstroke (the body is unable to control its temperature resulting in permanent disability or death).

Do you know the symptoms of heat illness?

Early Symptoms	Life-Threatening Symptoms
• Fatigue	• High body temperature
• Heavy sweating	• Red, hot, and dry skin
• Headache	• Confusion
• Cramps	• Convulsions
• Dizziness	• Fainting
• High pulse rate	
• Nausea or vomiting	

How does USC address heat illness?

USC educates employees and supervisors on heat illness through its Heat Illness Prevention Program. Departments must develop and implement a specific plan for their outdoor employees. USC EH&S is available to assist in this effort.

How can heat illness be prevented?

1. **Drink plenty of water.** Drink one quart of water over an hour during the work shift. Do not wait until you get thirsty. Do not drink alcohol, coffee, or soft drinks.
2. **Wear light-weight/loose-fitting clothing.** Include bandana; UV-absorbent sunglasses; and a wide-brimmed hat or cap. Use of personal protective equipment (e.g., air purifying respirators, heavy work suits, etc.) may increase your susceptibility to heat illness.
3. **Take frequent breaks.** Taking frequent breaks in the cool shade allows the body to recover from heat illness.
4. **Notify your Supervisor** of any personal risk factors (i.e., health, weight, age, etc.) that make you more susceptible to heat related illness.
5. **Be mindful of medication side effects.** Ask your health care provider or pharmacist if there are any adverse effects to being in the sun/heat while on prescription medication.

As an Employee, you must:

- Drink plenty of water.
- Take frequent breaks in cool shade.
- Wear light-colored/light-weight clothing.
- Wear sunscreen.
- Know the symptoms of Heat Illness.
- Contact DPS at (213) 740-4321 UPC (323) 442-1000 HSC; local emergency service provider; or 911.

Additional Information

Cal-OSHA Heat Illness Prevention 9-minute video:
https://www.youtube.com/watch?v=cR6FA5w8A1o (English);
https://www.youtube.com/watch?v=n7Wb1jmKA6I (Spanish)

Cal-OSHA Heat Illness Prevention eTool:
http://www.dir.ca.gov/dosh/etools/08-006/resources.htm

Cal-OSHA Heat Illness Prevention Standard (8CCR3395):
https://www.dir.ca.gov/title8/3395.html

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GuideSheet First Aid Kits

First-aid kits must be readily available for employees at every workplace and approved by a consulting physician[1]. There are two types: Class A (common injuries) and Class B (broad range of injuries). First aid kits are located in conspicuous areas of USC administrative offices, labs, and shop spaces.

The ANSI/ISEA Z308.1 standard specifies two types of first aid kits: ***Class A*** and ***Class B*** (see table).

- ***Class A*** - minimum supplies to treat common types of workplace injuries (e.g., minor cuts, abrasions, sprains, or burns). Examples: offices, research labs.
- ***Class B*** - supplies to treat a broader range of injuries that can occur in complex or high-risk work environments. Examples: field work, construction sites.

The contents of a first aid kit must be adequate and appropriate for all recognized workplace hazards. Where unique hazards are present, it is important that recognized treatment(s) for the hazards be added to the first aid kit. Some examples of areas or activities that require adding supplemental supplies to first aid kits:

- Use of phenol or hydrofluoric acid (HF)
- Food prep areas (e.g., kitchens) where burns and lacerations are highly likely
- Activities or research outdoors or in remote locations (e.g., Catalina, deserts, or oceans)
- Fuel stations or transportation yards
- Patrol cars (e.g., DPS), first responder vehicles, or other field vehicles

First Aid Supply	Class A	Class B
Adhesive Bandage 1 x 3 in.	16	50
Adhesive Tape 2.5 yd. (total)	1	2
Antibiotic Application 1/57 oz.	10	25
Antiseptic 1/57 oz.	10	50
Breathing Barrier	1	1
Burn Dressing (gel soaked) 4 x 4 in.	1	2
Burn Treatment 1/32 oz.	10	25
Cold Pack 4 x 5 in.	1	2
Eye Covering with means of attachment 2.9 sq. in.	2	2
Eye/Skin Wash	1 fl. oz. total	4 fl. oz. total
First Aid Guide	1	1
Hand Sanitizer 32 oz.	6	10
Medical Exam Gloves	2 pairs	4 pairs
Roller Bandage 2 in. x 4 yd.	1	2
Roller Bandage 4 in. x 4 yd.	-	1
Scissors	1	1
Splint 4 x 24 in.	-	1
Sterile pad 3 x 3 in.	2	4
Tourniquet 1 in, (width)	-	1
Trauma pad 5 x 9 in.	2	4
Triangular Bandage 40 x 40 x 56 in.	1	2

Reference: Cal-OSHA CCR Title 8, §1512. Emergency Medical Services https://www.dir.ca.gov/title8/1512.html

Resources

- ANSI/ISEA Z308.1-2015 Minimum Requirements for Workplace First Aid Kits and Supplies
- Honeywell® HF medical treatment document
- Calgonate® HF first aid instructions
- Hydrogen Fluoride Safety Fact Sheet
- HF Safety Data Sheet - SigmaAldrich
- Phenol Safety Fact Sheet
- Phenol Safety Data Sheet - SigmaAldrich

USC-approved Vendors

- VWR Class A first aid kits
- Grainger Class B first aid kits
- SOS Survival Products
- Cintas

Inspect first aid kits monthly to ensure completeness and usable condition of the supplies as required by the standard. Supplies that are expired must be replaced.

[1] Dr. Sarah Van Orman, Chief Health Officer of USC Student Health

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GuideSheet Common Disinfectants for the Laboratory

The table below depicts commonly used disinfectants in biomedical laboratories and summarizes the mode of action, hazards, benefits, and disadvantages of each.

Class of Disinfectants	Mode of Action	Advantages	Disadvantages	Hazards
Alcohols Examples • Ethyl alcohol (ethanol) • Isopropyl alcohol (isopropanol)	Damages cell membranes, denatures essential microbial proteins, and interferes with metabolism resulting in cell lysis. Mixtures of alcohols and water are more microbiocidally active than pure (absolute) alcohol, but microbiocidal activity decreases significantly if alcohol content falls below 50%.	• Does not leave any residue • Inexpensive	• Reduced activity against non-enveloped viruses • Evaporates before required contact time (requires prolonged contact time to be effective) • Not effective against spores • May harden rubber • Can dissolve certain glues	Flammable
Chlorine Compounds Examples • Household bleach (Chlorox) • Clidox-S	Available free chlorine acts as organic and fat solvent degrading fatty acids, transforming them into fatty acid salts and glycerol. They reduce the surface tension of the remaining solution and increase membrane permeability. Chlorine compounds affect surface antigen in enveloped viruses and DNA as well as structural alterations in non-enveloped viruses. Stability of available free chlorine depends on chlorine concentration, pH, presence of organic matter, and light.	• Inexpensive • Effective against enveloped and non-enveloped viruses • Wide bactericidal spectrum	• Must be made fresh to maintain available free chlorine at microbiocidally active levels • Corrodes metals • Activity significantly reduced by proteins (e.g. from serum) • Less bactericidal in more basic environment (elevated/increased/ higher pH) • Extended contact time required for tuberculocidal activity	May be incompatible with other disinfectants or chemicals > may cause development of chlorine vapor.

Table continues on next page.

USC Environmental Health & Safety

University Park Campus
3434 South Grand Ave, CAL 120
Los Angeles, CA 90089-2815

Health Sciences Campus
2001 N Soto St, SBA 329
Los Angeles, CA 90032

323.442.2200
biosafety@usc.edu
http://ehs.usc.edu

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Class of Disinfectants	Mode of Action	Advantages	Disadvantages	Hazards
Quaternary Ammonium Compounds (Quats) Examples • Lysol • Quatricide • Vindicator+	Affects proteins.	• Mainly effective against gram positive bacteria • Best use as addition to water baths and incubators (no halide or phenolic residue)	Not effective against spores.	Nontoxic, if handled and used according to the manufacturer's directions.
Phenolics Examples • Hil-Phene • Carbolic Soap	Causes proteolysis.	Active against vegetative bacteria and enveloped viruses.	Not effective against spores.	• Able to penetrate skin and latex gloves • Irritant
Iodophors Example • Wescodyne	Penetrates cell wall of microorganism and disrupts protein and nucleic acid structure and synthesis.	• Broad range activity including enveloped viruses, bacteria, fungi • Quick acting antimicrobial • Not affected by hard water	• Variable activity against non-enveloped viruses, *Mycobacterium tuberculosis*, and spores • Corrodes metals and stains surfaces	• Skin and eye irritant • Corrosive • Toxic
Accelerated Hydrogen Peroxide Examples • Accel Wipes • Oxivir®Tb • Sporocide Plus™	Hydrogen peroxide generates free hydroxyl radicals, which attack membrane lipids, essential cell components, and cause DNA strand breakage.	Effective against enveloped and non-enveloped viruses, gram positive, gram negative bacteria and fungi, and bacterial spores (*Clostridium difficile*).	Contact times for tuberculocidal activity may vary and need to be verified on SDS or product label information.	Safe to handle when following manufacturer's directions.
Peroxygen Compounds Example • Virkon S	Oxidation of proteins and other components of cell protoplasm leads to inhibition of enzyme systems and loss of cell wall integrity.	Effective against enveloped and non-enveloped viruses, gram positive, gram negative bacteria and fungi, and bacterial spores (*Bacillus subtilis*).	Mixed reports on activity against *Mycobacterium tuberculosis*.	Powder form is skin, eye, and inhalation irritant, corrosive, and toxic (solution containing Virkon S at a concentration of 1-2% only poses minimal hazards).

References
Biosafety in Microbiological and Biomedical Laboratories. Centers for Disease Control and Prevention/National Insitutues of Health, 5th Ed. U.S. Department of Health and Human Services. Washington, DC: 2009
Block, S. Disinfection, Sterilization, and Preservation, 4th Ed. Philadelphia: Lea and Febiger, 1991
McDonnell, G. Antisepsis, Disinfection, and Sterilization: Types, Action and Resistance. Washington, DC: ASM Press, 2007 New Hampshire Department of Education. EPA Registered Hard Surface Disinfectants Comparison Chart. https://www.education.nh.gov/instruction/school_health/documents/disinfectants.pdf.
U.S. Department of Health, Education, and Welfare. NIH Laboratory Safety Monograph: A Supplement to the NIH Guidelines for Recombinant DNA Research. National Institutes of Health, 1978.

GENERAL GUIDELINES FOR FIELDWORK INVOLVING TRAPPING AND HANDLING WILD RODENTS OR OTHER ANIMALS

Field-trapped rodents or their parasites are important sources of zoonotic diseases including rabies, plague, hantavirus pulmonary syndrome (HPS), tularemia, and lymphocytic choriomeningitis. The risk factors for infection are dependent on the rodent species being trapped, the geographical location, and prevalence of the disease, handling practices, and the health status of the field worker.

Guidelines outlined below must be followed by field personnel in order to avoid becoming infected with a zoonotic disease when trapping and releasing, sampling, transporting, or performing necropsy on potentially infected wild rodents.

PERSONAL PROTECTIVE EQUIPMENT	
Respiratory Protection	*1. Consult with EH&S to determine if respiratory protection will be required. If required, see (a) and (b) below:* *a. Respirators may be negative pressure type such as N-95, N-99, or N-100, or powered-air-purifying respirator (PAPR)* *b. Personnel planning to use N95 or other tight-fitting (negative pressure) respirators must first enroll in the respiratory protection program through USC Environmental Health & Safety (EH&S).*
Facial Protection	*Wear a face shield, or goggles to prevent accidental splashes or sprays of rodent urine, blood, or saliva.*
Gloves	*1. Double gloves must be worn when handling specimens (e.g., feces, body fluids, swabs, and/or aspirates) during field necropsy). NOTE: Ensure that PPE material selected is not harmful to the species being worked with.* *2. Gloves must be changed when contaminated and between handling individual rodents or rodent groups. Place soiled/ contaminated gloves in a plastic bag.* *3. Thick gloves, leather gloves, or gloves with chainmail must be worn when checking or retrieving traps, handling wild rodents during observations, or mark-release studies.* *4. Dispose of soiled PPE (e.g., biohazard, hazardous chemical, or radioactive contamination) per Biosafety Manual, Chemical Hygiene Plan, or Radiation Safety Manual guidelines.*
Other Protective Outerwear	*1. Appropriate PPE such as disposable gowns, coveralls, long pants, long-sleeved shirts, disposable sleeve covers, safety shoes or boots should be worn when handling rodents and traps. Conduct a risk assessment to determine appropriate PPE or contact EH&S for assistance.* *2. After doffing a disposable gown, carefully turn it inside out and place it in a plastic bag.* *3. PPE and boots/shoes worn when handling wild rodents must be doffed before entering a USC animal facility.* *4. Dispose of soiled PPE (e.g., biohazard, hazardous chemical, or radioactive contamination) per Biosafety Manual, Chemical Hygiene Plan, or Radiation Safety Manual guidelines.*
PERSONAL HYGIENE	
Hand Hygiene	*1. Perform hand hygiene after contact with rodents, blood and other body fluids, environmental surfaces, handling specimens, after cleaning traps, removing gloves, and before eating and drinking.* *2. Wipe soiled hands with bleach-wipes to remove dirt before washing hands or using a sanitizer.* *3. Wash hands thoroughly with soap and water.* *4. Alcohol-based disinfectants are acceptable if water is unavailable.* *5. Avoid contact of mucous membranes (eyes, nose, mouth) with aerosols, contaminated hands or materials.*
FIELD WORK	
Basics	*1. For anesthesia, injectables or a mobile anesthetic device such as the Somnosuite with an attached induction chamber which uses air for gas delivery, are recommended.* *2. Weather permitting, field sample processing should be performed outdoors because of greater ventilation.* *3. Perform work in the field with the wind to the back and traps or trapped animals located downwind.* *4. If indoors, adequate ventilation of the area to the outside should be provided.* *5. Report any injuries to USC EH&S and complete the required injury form.*
Trap cleaning	*1. Traps used to capture rodents must be disinfected prior to re-use in the field* *2. Remove any organic materials with a moist paper towel to avoid aerosolization.* *3. Disinfect traps by submerging them in 10% bleach for 20-30 minutes. Rinse thoroughly with water; air dry in sun.* *4. If traps cannot be disinfected in the field, place them in a sealed transport container (e.g., a plastic bag) for transport to an appropriate location for disinfection.*
Disinfection/ Waste Disposal	*1. A disinfection kit containing disinfectant (see Common Disinfectants for the Laboratory above), brush, soap, paper towels, and water must be available.* *2. Tables, other work surfaces, and chairs must be of a non-porous material that can be easily cleaned or disinfected.* *3. Trap bedding, bait, and feces must be carefully removed to avoid dust and aerosols, placed in a plastic bag for transport (consider secondary containment with labeling), and properly disposed of as biohazardous waste.*
Animal Transport	*1. An approved IACUC protocol and DAR approval for transporting animals in personal vehicles is required before transporting any live or dead wild rodent specimens or tissues.* *2. Avoid contamination of the vehicle passenger seats during transport and follow DAR policy.* *3. Use the appropriate PPE to transfer the trapped rodents to micro-isolator.*

TRAINING AND DOCUMENTATION

The undersigned acknowledge by their signature that they have read, understood, have access to, and agree to abide by this Field Safety Plan.

Name	Emergency Phone No.	Signature	Date

FIELD SAFETY PLAN REVIEW/REVISION

Date prepared: By:

Date revised: By: