

In this issue of the Environmental Health and Safety (EHS) Listserv – May 8, 2024

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1. Plant Research at UNL

Use of **genetically modified** plants in research in laboratories, greenhouses, growth chambers, or other contained facilities at UNL triggers the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines, <https://osp.od.nih.gov/policies/biosafety-and-biosecurity-policy#tab2/>) and requires review by the UNL Institutional Biosafety Committee (IBC). Transgenic plants that have been approved for field release or deregulated by USDA APHIS, when grown for research purposes in contained facilities, are still considered recombinant by NIH Guidelines definitions and need to be included in an IBC protocol. Additionally, research work with plant pathogens in contained facilities requires UNL IBC approval per UNL Biosafety Guidelines (https://ehs.unl.edu/documents/Biosafety_Guidelines.pdf). IBC protocol forms are submitted through the Institutional Biosafety Committee module of NuRamp (<https://nuramp.nebraska.edu/login>).

For additional information about how these Biosafety Guidelines may apply to your work please visit our website

<https://ehs.unl.edu/committees/ibc/about-ibc> to access the “Plant Research and UNL IBC Protocol Clarification” document. For questions and to further discuss your research please contact biosafety staff at 402.472.4925 or ibc@unl.edu.

2. UNL Institutional Biosafety Committee (IBC) Updates

In April, National Institutes of Health, Office of Science Policy (NIH OSP) released an amended version of the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines, <https://osp.od.nih.gov/policies/biosafety-and-biosecurity-policy#tab2/>).

Changes include the following:

- Addition of minimum containment requirements for work with gene drive modified organisms (GDMOs), considerations for risk assessment of the work, and IBC and BSO responsibilities. NIH OSP has provided a reference document “Biosafety Considerations for Contained Research Involving Gene Drive Modified Organisms” <https://osp.od.nih.gov/wp-content/uploads/2024/03/gdmo-reference.pdf> to assist institutions. This work will fall under the new Section III-D-8.
- “Gene drive” has been defined as a technology whereby a particular heritable element biases inheritance in its favor, resulting in the heritable element becoming more prevalent than predicted by Mendelian laws of inheritance in a population over successive generations.
- The term “helper viruses” has been replaced by “helper systems” in Sections III-D and III-E with the inclusion of examples of what material falls under this definition: helper viruses, packaging cell lines, transient transfection systems, and replicon systems. Many researchers at UNL utilize lentiviral or adenoviral vectors in their work and labs prepare infectious particles; so, the work falls under these guidelines.
- West Nile Virus (WNV) and Saint Louis Encephalitis Virus (SLEV) are being relisted as Risk Group 2 viruses in line with Biosafety in Microbiological and Biomedical Laboratory (BMBL), 6th Edition BSL-2 containment guidance.
- The language of III-F-1 (exempt experiment with synthetic nucleic acids) has been changed to be “are not designed to introduce a stable genetic modification” from “are not designed to integrate into DNA.” With this change, transfection of a ribonucleoprotein complex to genetically modify an organism or cell is no longer exempt work. Further, an organism created from this experiment is considered genetically modified or recombinant.

Please contact EHS biosafety staff for questions and/or assistance with an IBC protocol. 402.472.4925 or ibc@unl.edu

Resources

- Federal Register Notice/Vol. 89, No. 67/Friday, April 5, 2024, <https://www.govinfo.gov/content/pkg/FR-2024-04-05/pdf/2024-07082.pdf>
- NIH Guidelines, <https://osp.od.nih.gov/policies/biosafety-and-biosecurity-policy#tab2/>
- UNL IBC website <https://ehs.unl.edu/committees/ibc/about-ibc>
- UNL Biosafety Guidelines https://ehs.unl.edu/documents/Biosafety_Guidelines.pdf

3. National Motorcycle Safety Month & National Bike Safety Month

Situational preparedness is so important that this listserv provides resources to promote safe navigation of roadways, whatever the method of transportation.

Motorcyclists and bicyclists are more vulnerable to crashes than vehicles on the road. Per mile travelled, motorcyclists are 27 times more likely than people in passenger cars to die in a traffic crash. The number of bicycle incidents in the United States has increased 29% over a recent eight-year period.

With more riders on the roads as weather improves, the need for additional precautions arises. The National Highway Traffic Safety Administration (NHTSA) has designated May as Motorcycle Safety Awareness Month, and the League of American Bicyclists recognizes May as National Bicyclist Safety Month. The National Safety Council (NSC) supports both of these efforts.

Remember that both motorcycles and bicycles are relatively small, and thus drivers often do not see these modes of transportation. Some safety tips that apply to both motorcycle and bicycle riders are:

- Be sure your bicycle or motorcycle is “ride ready”. Check tire pressure, brakes, etc.
- Know and follow the rules of the road.
- Wear bright or reflective clothing that is durable with arms and legs covered, sturdy shoes or boots, and a helmet that conforms to the appropriate design standards.
- Assume you are invisible to other motorists and position yourself to be seen.
- Signal every turn or lane change.

- Drive defensively in the same direction as traffic. Pay special attention at intersections where half of all collisions occur. Always look out for cars turning or backing out of driveways.
- Don't weave in and out of lanes, or ride on the shoulder or between lanes.
- Watch for hazards like potholes, manhole covers, oil slicks, puddles, debris, railroad tracks and gravel.

The best way to reduce your odds of dying or being severely injured in a crash is to get educated:

- The Motorcycle Safety Foundation (<https://www.msf-usa.org/library.aspx#ridercourse-materials-link>) offers safety booklets, downloadable Rider Course handbooks, videos, quick tips, white papers and more. They can also help you find a motorcycle safety course near you.
- RideApart (<https://www.rideapart.com/features/254912/10-common-motorcycle-accidents-and-how-to-avoid-them/>) publishes a list of the 10 most common causes for motorcycle accidents and how to avoid them, complete with videos. Many of the tips at this site apply equally to bicyclists.
- UNL's Campus Recreation department provides resources including clinics related to safe bicycling, maintenance and more. Find a class here: <https://crec.unl.edu/activities/clinics>
- A core activity of the League of American Bicyclists is education. Find smart bicycling tips and videos at <https://bikeleague.org/ridesmart>

Get educated and ride safely so you do not become a statistic!

Resources

- CPSC (Consumer Product Safety Commission) Which Helmet for Which Activity? (reference chart on helmet standards) <https://www.cpsc.gov/safety-education/safety-guides/sports-fitness-and-recreation-bicycles/which-helmet-which-activity/>
- MAY IS BIKE MONTH, The League of American Bicyclists <https://bikeleague.org/bikemonth>
- Bike Safely and Enjoy Your Ride, NSC <https://www.nsc.org/home-safety/tools-resources/seasonal-safety/summer/bicycles>
- Motorcycle Roadway Safety, NSC <https://www.nsc.org/road-safety/safety-topics/motorcycle-safety>
- Bicycle Safety, NHTSA <https://www.nhtsa.gov/road-safety/bicycle-safety>
- Motorcycle Safety, NHTSA <https://www.nhtsa.gov/road-safety/motorcycle-safety>

- Walter, L. (2012, May 15). 6 Tips for Motorcycle Safety Awareness Month. Retrieved April 30, 2024, from <https://www.ehstoday.com/safety/article/21915121/6-tips-for-motorcycle-safety-awareness-month>

4. Avoid Heat Illness

The United States Occupational Health and Safety Administration (OSHA) and the National Weather Service team up to encourage everyone to recognize the warning signs for heat illness. Heat exhaustion and dehydration due to heat are some of the leading weather-related killers in the United States and result in dozens of fatalities and thousands of heat-related illnesses each year. On average, extreme heat has killed more people in the last ten years than any other weather phenomena.

We often associate heat-related illness with outdoor operations such as farm work, landscaping, and research “in the field.” However, EHS routinely reviews injury reports from employees working INSIDE an unconditioned building (e.g., warehouse, storeroom) or areas of a building prone to heat build-up (e.g., kitchens, laundry, autoclave rooms, etc.).

Working in the heat stresses the body and can lead to illness or even death in severe cases. Exposure to heat can also increase the risk of other injuries because of sweaty hands, fogged-up safety glasses, dizziness, and burns from hot surfaces. Most heat-related health problems can be prevented or the risk of developing them can be reduced.

Following are two main categories of risk factors the worker should evaluate when contemplating outdoor work:

- **Weather Conditions.** The risk of heat stress is relative to temperature, humidity, sunlight, and wind speed. High temperature, high humidity, direct sunlight and low wind speed make the worst combination. If possible, schedule strenuous work for the cooler parts of the day.
- **Personal Factors and Physical Demands.** The risk of heat stress increases with physical demands. For example, a worker who is walking is at higher risk than a worker who is riding in a vehicle. Older workers, obese workers, and persons taking certain types of medication, such as antihistamines, are at a greater risk for heat illness.

It may not always be possible to work only in cooler parts of the day. The risk of heat-related illness can be reduced by:

- **Acclimation.** Build up tolerance to heat by short exposures before undertaking longer periods of work in a hot environment.
- **Appropriate clothing.** Light, loose clothing and a hat are the recommended clothing of choices.
- **Hydration.** Drink 8-16 ounces of water before working in the heat. Drink 4-8 ounces of water or electrolytes every 15-20 minutes while working in the heat. AVOID alcohol, coffee, tea, or soda pop, which further dehydrate the body.
- **Adequate Rest Periods.** Work at a steady pace. Take breaks when your body signals you need one, preferably in shaded or cool areas.
- **Education.** Heat stress can manifest in a number of ways, all to be taken seriously, and some requiring medical assistance to avoid permanent aftereffects. Workers should know the signs and symptoms of these conditions so they can take proper action if they or their co-workers are affected.

OSHA in collaboration with the Centers for Disease Control and Prevention (CDC) and National Institute for Occupational Safety and Health (NIOSH) has developed a free smartphone **Heat Safety Tool** that calculates a heat index, identifies the associated risk level and provides reminders about protective measures that should be taken to protect workers from heat-related illness. The free app is available for either Android or iPhone.

Further recommendations from NIOSH for those working in hot environments include:

- Limit time in the heat and/or increase recovery time in a cool environment.
- Use a buddy system so workers can observe each other for signs of heat intolerance.
- Have adequate amounts of cool, potable water near the work area and encourage each other to drink frequently.

While we think of summer as the “hot” time of year outdoors, sometimes temperatures and humidity levels in the spring or fall can reach dangerous levels as well. In addition, certain indoor work areas may be “hot” year-around. Remember to practice heat safety wherever you are and with whatever tasks you are doing. Heat-related illness and death are preventable.

Resources

- VIDEO. 60-Second Video Message on Heat Illness Prevention. USDepartmentofLabor. Duration: 1:02 minutes.
https://www.youtube.com/watch?v=ipWmbc0d_Lc

- VIDEO. 7 Ways to Beat the Heat – Hot Weather Hazards – Preventing Illness & Deaths in Hot Environments. Safety Memos. Duration: 3:28 minutes.
<https://www.youtube.com/watch?v=WYnj1G94e6Y>
- Extreme Heat: Forecast and Safety
<https://www.weather.gov/rah/heat>
- OSHA Health and Safety Topics: Heat
<http://www.osha.gov/SLTC/heatstress/>
- OSHA-NIOSH Heat Safety Tool App
<https://www.cdc.gov/niosh/topics/heatstress/heatapp.html>
- OSHA Heat Illness Prevention <https://www.osha.gov/heat/>
- EHS **Heat Stress** SOP <https://ehs.unl.edu/sop/s-heatstress.pdf>
- National Institute for Health & Safety (NIOSH) Safety & Health Topics: *Heat Stress* <http://www.cdc.gov/niosh/topics/heatstress/>
- Heat Safety Tips and Resources
<https://www.weather.gov/safety/heat>

5. Get to Know New EHS Staff

We would like to introduce you to a couple EHS staff you may not have had the chance to meet yet:

- Hello, my name is Pat Neher. I am happy to be a part of EHS, working primarily with Operations Compliance as a Project Coordinator. My background includes a career in management at software product and services vendors, primarily in the financial services field. I graduated high school in Lincoln and attended UNL for a couple of years before moving to Austin, Texas for about 30 years for work. I eventually earned a degree in Psychology at St. Edward's University in Austin. When I'm not working, I enjoy spending time with my 16 (soon to be 17) grandnieces/nephews and traveling to visit friends I've met over the years through my former career in software management.
- Hello, my name is Stephanie Padilla. I'm a Registered Nurse of 26 years. After receiving my BSN from UNL, I spent the majority of those years on the Long-Term Acute Care Unit and the Cardiac Rehab Program for a Lincoln rehabilitation hospital. I've held certifications in Rehabilitation Nursing, Traumatic Brain Injury, and Wellness Coaching. I came to UNL in 2020, working at the Covid testing stations on campus. That led to an opportunity to work with the IACP where I conduct health/risk assessments for faculty, staff, and students that work with animals. Recently I joined EHS and am a team member for the Respiratory Protection and Hearing Conservation Programs.

6. Updated Training and Safe Operating Procedures

The following training has been updated to reflect autoclaving references and changes by NIH:

- **Autoclave Operation** <https://ehs.unl.edu/web-based-training#AUTOCLA>
- **Biosafety 100: Research Compliance** <https://ehs.unl.edu/web-based-training#BioRC>
- **Biosafety 101** <https://ehs.unl.edu/web-based-training#Bio101>
- **Biosafety 201** <https://ehs.unl.edu/web-based-training#Bio201>

The following SOPs have been updated to change autoclaving references, and selected other information:

- **Autoclave Operation and Use** <https://ehs.unl.edu/sop/s-bio-autoclavesafety.pdf>
- **Biological Decontamination of Laboratory Equipment** https://ehs.unl.edu/sop/s-bio-decontamination_lab equip.pdf
- **Biosafety Training** <https://ehs.unl.edu/sop/s-bio-training.pdf>
- **Disposing of Biohazardous Materials, Including Recombinant or Synthetic Nucleic Acids** <https://ehs.unl.edu/sop/s-bio-dispose.pdf>
- **Guidance for Collection and Storage of Human Samples** https://ehs.unl.edu/sop/s-bio-guidance_collection_storage_human_samples.pdf
- **Lentiviral Vectors** https://ehs.unl.edu/sop/s-lentiviral_vectors.pdf
- **Mammalian Cell and Tissue Culture Biosafety** https://ehs.unl.edu/sop/s-bio-cell_tissue_cultures.pdf
- **Preparing a Laboratory Biosafety Manual** https://ehs.unl.edu/sop/s-bio-preparing_biosafety_manual.pdf

ADOPT SAFETY AS YOUR ATTITUDE – DON'T LEARN BY ACCIDENT!

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