Plant Research and UNL Institutional Biosafety Committee (IBC)

ENVIRONMENTAL HEALTH AND SAFETY
University of Nebraska-Lincoln

IBC Guidance for Plant Research Personnel:

All recombinant/ genetically modified/ transgenic plants (including commercially available seed and plants) grown in UNL greenhouses, growth chambers, or laboratories are subject to the NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules (NIH Guidelines, https://osp.od.nih.gov/wp- content/uploads/NIH_Guidelines.pdf). This includes, but is not limited to, the following:

- Commercially available genetically modified (contains recombinant or synthetic nucleic acid that can replicate in a living cell, chemically or by other means synthesized or amplified that can base pair with naturally occurring nucleic acid molecules or molecules that result in replication of those just described) viable seeds or plants
    - Even if the transgenic/ genetically modified seed or plant is commercially purchased/ sold commercially
- Plants that were created via recombinant tools and retain stable genetic modifications from gene editing tools are still considered recombinant, even when editing transgenes have been segregated away from the modified allele.

Typically, the use of recombinant/ genetically modified/ transgenic plants in research falls under Section III-E and III-E- 2 of the NIH Guidelines. Experiments with plants that include recombinant and synthetic nucleic acid techniques and exotic infectious agents fall under III-D-5 and experiments with recombinant/ genetically modified/ transgenic plants that include insects/ animals fall under III-D-4.

NOTE: Research with plant pathogens is also subject to approval by the UNL IBC and requires an approved IBC protocol before work can begin. For more information refer to the UNL Biosafety Guidelines (https://ehs.unl.edu/sites/unl.edu.business-and-finance.university-operations.ehs/files/media/file/Biosafety%20Guidelines.pdf).

IBC protocols are submitted via the **Institutional Biosafety Committee** module of **NuRamp** (https://nuramp.nebraska.edu/login). Should you have questions while completing a form, please reach out via ibc@unl.edu or call 402.472.4925 and request to speak to biosafety staff.

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IBC New Protocol Form Summary:

A new protocol can be started from the Protocol page of the IBC module in NuRamp, select 'Add New IBC Protocol':

- Page 1, Section I, General information about the faculty member, personnel and protocol attributes.
    - Protocol attributes to be aware of and potentially check are #1 for recombinant material (plants, insects, or any other form), #2 for Gene-drive modified organisms/ plants, #4 for plant pathogen work, #5 for field release of transgenic plants and or any plant pathogen, including releases conducted under the USDA APHIS, #7 for genetically modified organisms (plants, insects, animals), and #13 if a USDA/ APHIS/ CDC/ Wildlife Services permit is required.
- Page 1, Section II, Research Description
    - Include enough detail to provide the IBC context for the research and materials listed in later sections.
- Page 2, Section III, Microorganisms
    - If you perform transformations with *Agrobacterium spp.*, include an entry for the Agro. Additionally, if you propagate plasmids in *E. coli*, include an entry for *E. coli* and provide the strains in use.
    - Click the 'Not Applicable' box if your work does not include plant pathogens/ microorganisms.
- Page 2, Section IV, Cell/Tissue Culture
    - Click 'Not Applicable' if no applicable cells or plant tissue samples are utilized in your research.
- Page 2, Section V, Research Organism
    - Create a separate entry for each species of recombinant plant strain that will be utilized.
        - Include separate entries for wild-type plants if they will be treated with or receive recombinant and/or synthetic nucleic acids.
    - Entries should include information about the genetic modification to the plant.
        - If the plant is genetically modified, please answer 'Yes' to question 6 and indicate whether it will be generated at the UNL Plant Transformation Core or received from a collaborator.
        - If the plant is treated with a pathogen or microbe, please answer 'Yes' to question 7.
- Page 3, Section VI, Recombinant and/or Synthetic Nucleic Acid Information

  - Add gene sequences and plasmid information if the manipulations are occurring in your laboratory.
  - If you are receiving transgenic plants and not further genetically modifying them, this section can be checked 'Not Applicable.'
- Page 4, Section VII, Toxin Information
  - Only list toxins that are isolated and/or used in treatments.
  - If working with a toxin producing organism, but the toxin is not isolated, no entry is needed and 'Not Applicable' should be selected.
- Page 4, Section VIII, Facilities
  - List your laboratory space and greenhouse(s) space/usage.
- Page 4, Section IX, Specialized Equipment Information
  - Specialized Equipment needed like special netting or bags.
- Page 5, Section X, Risk Assessment
  - Provide information relevant to your work.
  - Select containment level for each work location, laboratory, and greenhouse. For additional information, see the EHS SOP: Biosafety Containment Levels, https://ehs.unl.edu/sop/s-bio-containment_levels.pdf .
  - Disinfectants, see EHS SOP: Chemical Disinfectant for Biohazardous Materials https://ehs.unl.edu/sop/s-bio-disinfectants.pdf ,
  - Biological Decontamination and Disposal Methods, such as autoclaving; see EHS SOP: Disposing of Biohazardous Materials, Including Recombinant or Synthetic Nucleic Acids, https://ehs.unl.edu/sop/s-bio-dispose.pdf .
- Page 5, Section XI, Relevant attachments (biosafety manual, inventory, permits) can be included in this section.

For questions, please reach out to biosafety staff at ibc@unl.edu or by calling 402.472.4925.