

# POTENTIALLY HAZARDOUS BIOLOGICAL AGENTS AND HAZARDOUS MATERIALS

Potentially Hazardous Biological Agents (PHBAs) include microorganisms (including bacteria, viruses, viroids, prions, rickettsia, fungi and parasites) and recombinant DNA technologies. Hazardous Materials include Hazardous chemicals, devices and radiation.

1. Research involving PHBAs is permitted when conducted at a RRI or a certified BSL-2 laboratory at a high school. Research must be closely supervised and should follow all Institutional Biosafety Committee (IBC) requirements.
  - a. Experimentation involving the culturing of potentially hazardous biological agents, even BSL-1 organisms, is prohibited in a home environment.
  - b. Research with unknown microorganisms can be treated as a BSL-1 study under the following conditions, if not stored in a home environment as of June 2020:
    - i. If experimentation occurred in the home environment prior to 2020, this research is eligible for STS as long as all conditions of rule 1b are met. Student must provide documentation to demonstrate the dates of experimentation.
    - ii. Organism is cultured in a plastic petri dish (or other standard non-breakable container) and sealed.
    - iii. Experiment involves only procedures in which the petri dish remains sealed throughout the experiment (e.g., counting presence of organisms or colonies).
    - iv. The sealed petri dish is disposed of via autoclaving or disinfection under the supervision of the mentor/supervising scientist/PI.
    - v. If a culture container with unknown microorganisms is opened for any purpose, (except for disinfection for disposal), it must be treated as a BSL-2 study and involve BSL-2 laboratory precautions.
2. Research involving Hazardous Materials is permitted when the research meets the following requirements:
  - a. Student researcher has completed a risk assessment process, and a supervising adult can verify that student identified potential risks prior to experimentation, and followed proper safety precautions and disposal methods.
  - b. Project remains within local, state and federal laws.
3. Risk Assessment
  - a. Students who worked with PHBAs and Hazardous Materials will be asked to upload a Risk Assessment Form in the online application. The Risk Assessment Form is available in Appendix 9.
  - b. Hazardous Materials
    - i. Chemicals should be assessed for toxicity, reactivity, flammability and corrosiveness. The type and amount of exposure to a chemical must be considered in the risk assessment. Student researcher must refer to the Materials Safety Data Sheets provided by the vendor (SDS) to ensure proper safety precautions are taken. A risk assessment must include proper disposal methods for the chemicals used in an experiment.
    - ii. Devices including potentially hazardous/dangerous equipment or other devices, in or outside a laboratory setting that require a moderate to high level of expertise to ensure their safe usage (high vacuum equipment, heated oil baths, NMR equipment, high-temperature ovens, etc). It is recommended that all student designed inventions also have documentation of a risk assessment.
    - iii. A risk assessment must be conducted when a student's project involves radiation beyond that normally encountered in everyday life. Non- ionizing radiation includes the spectrum of ultraviolet (UV), visible light, infrared (IR), microwave (NW), radiofrequency (RF) and extremely low frequency (ELF).