Arthropod Research

Arthropods present unique containment challenges not encountered with microbial pathogens. Please refer to the Biosafety Manual for more information and resources. There is a comprehensive appendix that discusses arthropod research.

Arthropod risk assessment is primarily a qualitative judgment that cannot be based on a prescribed algorithm. Several factors must be considered in combination: the agents transmitted, whether the arthropod is or may be infected, the mobility and longevity of the arthropod, its reproductive potential, biological containment, and epidemiological factors influencing transmission in the proposed location or region at risk. Arthropod vectors of infectious agents can be assigned to discrete categories. Each category has a range of risks that need to be assessed.

The Arthropod Containment Guidelines (ACG) provide principles of risk assessment for arthropods of public health importance. The risk assessment and practices are designed to be consistent with the NIH Guidelines for recombinant DNA research and the BMBL. Arthropods included are those that transmit pathogens; however, those arthropods that cause myiasis, infestation, biting, and stinging are not included. The ACG also specifically exclude most uses of *Drosophila* spp.

The ACG contain two sections of greatest interest to most researchers:

1. The Principles of Risk Assessment that discusses arthropods in the usual context (e.g., those known to contain a pathogenic agent, those with uncertain pathogens, and those with no agent).
2. They also consider the following:
    - Biological containment is a significant factor that reduces the hazards associated with accidental escape of arthropods.
    - Epidemiological context alters the risks of an escape and its impact on the location or site in which the work is performed.
    - The phenotype of the vector, such as insecticide resistance; and
    - Genetically modified arthropods with an emphasis on phenotypic change.

Four Arthropod Containment Levels (ACL 1 – 4) add increasingly stringent measures and are similar to biosafety levels. The most flexible level is ACL-2 that covers most exotic and transgenic arthropods and those infected with pathogens requiring BSL-2 containment. Like the BMBL, each level has the following form:

- Standard practices
- Special practices
- Equipment (primary barriers)
- Facilities (secondary barriers)

The guidelines are subject to change based on further consideration of the requirements for containment of arthropods and vectors.

If you hold a federal permit:

Permit Conditions are issued to you on your permit form. The inspector will review each one of these conditions with you during site visits.

The most common unsatisfactory findings during a site visit are:

1. Written SOP (standard operating procedure) is not available/or lab is not following the SOP
2. Autoclave is not calibrated annually
3. Record keeping is not in compliance with the permit
4. Permit Department was not notified of a laboratory relocation PRIOR to the move
5. Research has stopped but Permit Department has not been notified
6. Permit holder has left campus without notifying Permit Department
7. Safety training is not up to date