Appendix E—Arthropod Containment Guidelines (ACG)

An ad hoc committee of concerned vector biologists including members of the American Committee of Medical Entomology (ACME), a subcommittee of the American Society of Tropical Medicine and Hygiene (ASTMH), and other interested persons drafted the original Arthropod Containment Guidelines (ACG) in 2003.[1] The guidelines provide principles and practices for risk assessment for research on arthropods of public health importance. The risk assessment and practices in the ACG are designed to be consistent with the *NIH Guidelines* for recombinant DNA research and the BMBL.

The ACG were published in hard copy in the March 2019 issue of *Vector-Borne Zoonotic Diseases*[2] and are freely downloadable from https://www.liebertpub.com/doi/10.1089/vbz.2018.2431.

The ACG recommend biosafety measures specific for arthropods of public health importance considering that:

- Arthropods present unique containment challenges not encountered with microbial pathogens; and
- Arthropod containment has not been covered specifically in BMBL or the *NIH Guidelines*.

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

- 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). 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.
- Factors considered in Arthropod Containment Level (ACL) classification include:
  - 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, which covers most exotic and transgenic arthropods and those infected with pathogens requiring BSL-2 containment. Like the BMBL, each level has four components, with the following similar format:

- Standard practices;
- Special practices;
- Equipment (primary barriers); and
- Facilities (secondary barriers).

The ACG do not reflect a formal endorsement by ACME or ASTMH. The guidelines are subject to change based on further consideration of the requirements for containment of arthropods and vectors.

References

1. American Committee of Medical Entomology; American Society of Tropical Medicine and Hygiene. Arthropod containment guidelines. A project of the American Committee of Medical Entomology and American Society of Tropical Medicine and Hygiene. Vector Borne Zoonotic Dis. 2003;3:61–98.
2. American Committee of Medical Entomology; American Society of Tropical Medicine and Hygiene. Vector-Borne and Zoonotic Diseases. New Rochelle (NY): Mary Ann Liebert, Inc.; 2019.