

**Opportunity Title:** CDC Mosquito Surveillance and Control Fellowship

**Opportunity Reference Code:** CDC-DVBD-2019-0127



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**Organization** Centers for Disease Control and Prevention (CDC)

**Reference Code** CDC-DVBD-2019-0127

**How to Apply** A complete application consists of:

- An application
- Transcripts – [Click here for detailed information about acceptable transcripts](#)
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- One educational or professional recommendation. Your application will be considered incomplete, and will not be reviewed until one recommendation is submitted.

All documents must be in English or include an official English translation.

If you have questions, send an email to [ORISE.CDC.NCEZID@orau.org](mailto:ORISE.CDC.NCEZID@orau.org). Please include the reference code for this opportunity in your email.

**Application Deadline** 5/31/2019 3:00:00 PM Eastern Time Zone

**Description** \*Applications will be reviewed on a rolling-basis.

Two research opportunities in surveillance and control of mosquitos and mosquito-borne diseases are currently available in the Arboviral Disease Branch within the Division of Vector-Borne Diseases (DVBD), of the National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) at the Centers for Disease Control and Prevention (CDC) in Fort Collins, Colorado.

These projects will focus on determining the extent of an invasive and endemic mosquito species in the US and evaluation of an intervention to manage select species.

Project 1: *Aedes aegypti* was discovered in Clark County, Nevada in May 2017, well outside of the documented and expected range of this species. The Southern Nevada Health District's (SNHD) Vector Surveillance program mounted a robust surveillance response, deploying previously trained surge Environmental Health staff, to quickly determine the extent of the *Ae. aegypti* population and provide homeowner prevention education. Although not an abatement agency, SNHD implemented emergency mosquito control measures including Ultra Low Volume fogging using portable handheld and truck mounted units. Despite these interventions, ongoing surveillance shows the population persists. Current efforts are focused towards monitoring the geographic distribution and arboviral status of the *Ae. aegypti* population while providing public health education on mosquito breeding and bite prevention. In 2018, surveillance indicates that the species is still present within an area encompassing 3 zip codes, albeit in low numbers. We propose a two year project to 1) evaluate the current surveillance strategy in Clark County to ensure the trap sites and numbers are sufficient to document the presence and potential spread of *Aedes aegypti*; 2) conduct field experiments (including Mark-Release-Recapture) to examine the environmental factors in north Las Vegas that allow *Ae. aegypti* to survive; 3) evaluate insecticide resistance profiles for the local *Ae. aegypti* population; and 4) work with the SNHD to evaluate novel and traditional mosquito

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control techniques to determine if they are needed and if so, which technique, or combination of techniques, is feasible, affordable, and sustainable, with a goal to eliminate *Aedes aegypti* from the area and to protect the area against future introductions and establishment of this container mosquito.

Project 2: The CDC created and maintains the national surveillance system MosquitoNET, an on-line, centralized database developed to track, report, and store information regarding mosquito collections and insecticide resistance detected through testing with the CDC Bottle Bioassay. Contributors set up and manage individual accounts in the database to view, add and edit mosquito surveillance and insecticide resistance data. Data from MosquitoNET can be used to: Improve knowledge of the biology of mosquitoes across the Continental United States and U.S. Territories, develop modeling and mapping of mosquito populations, understand insecticide susceptibility or resistance patterns, understand sub-county level predictive models for presence or abundance of *Aedes aegypti* and *Aedes albopictus* populations, and prepare for emergency response to mosquito-borne disease.

Under the guidance of a mentor, the participant will be involved in the following activities:

- Mark-release-recapture experiments in Las Vegas
- Monitoring mosquito populations
- Evaluating mosquito control techniques including novel techniques that have never been used in the US
- Determining insecticide resistance profile for Las Vegas *Aedes aegypti* population for all pyrethroids and organophosphates used in the regions
- Determining the mechanisms of insecticide resistance using advanced molecular techniques
- Determining geographic distribution of mosquitoes in the continental US (150 species; all states and territories)
- Collaborating with the health department in the US on mosquito control concerns

Learning objectives for this opportunity include:

- Understanding of how invasive mosquitoes are monitored and managed
- Understanding of how mosquitoes are distributed in the US and environmental factors that drive population movement
- Develop mosquito-borne disease lab skills - virus isolation; PCR; mosquito identification
- Perform CDC Bottle Bioassay for determining insecticide resistance in mosquitoes
- Learn advanced molecular techniques for determining mechanisms of insecticide resistance

This program, administered by ORAU through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education, was established through an interagency agreement between DOE and CDC. The initial appointment can be up to one year, but may be renewed upon recommendation of CDC contingent on the availability of funds. The participant will receive a monthly stipend commensurate with educational level and experience. Proof of health insurance is required for participation in this program. The appointment is full-time at CDC in the Fort Collins, Colorado, area. Participants do not become employees of CDC, DOE or the program administrator, and there are no employment-related

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benefits.





## Qualifications

The qualified candidate should have received a doctoral degree in one of the relevant fields, preferably in medical entomology or public health and vector-borne diseases, or be currently pursuing the degree and will reach completion by the end of May 2019. Degree must have been received within five years of the appointment start date.

Preferred skills:

- Experience in use of taxonomic keys
- Statistical analysis
- Knowledge of mosquito biology and identification, and mosquito-borne diseases (natural cycles and ecology of viruses)

## Eligibility Requirements

- **Degree:** Doctoral Degree received within the last 60 months or anticipated to be received by 5/31/2019 11:59:00 PM.
- **Discipline(s):**
  - **Computer, Information, and Data Sciences** (2 )
  - **Earth and Geosciences** (1 )
  - **Life Health and Medical Sciences** (5 )
  - **Mathematics and Statistics** (3 )