

2016

Institute for Integrative Genome Biology Center for Disease Vector Research

About CDVR

The Center for Disease Vector Research (CDVR) was established by Entomologist Alexander Raikhel in 2005 and contains faculty from the following units:

- ▶ Biomedical Sciences
- ▶ Botany & Plant Sciences
- ▶ Cell Biology and Neuroscience
- ▶ Computer Science & Engineering
- ▶ Electrical & Computer Engineering
- ▶ Entomology
- ▶ Nematology
- ▶ Plant Pathology & Microbiology

Under current Director, Karine Le Roch, researchers collaborate across disciplines to find new approaches to control the spread of plant and animal disease vectored by arthropods. Within California and the United States, insect-vectored disease continually threatens agriculture, especially in regions of moderate to high environmental stress. Indeed, an economically and environmentally viable agricultural industry can only be obtained and maintained by utilizing the knowledge of insect biology towards the control of insect pests in an environmentally responsible and sustainable manner.



KARINE LE ROCH
CDVR Director
Associate Professor
Cell Biology & Neuroscience

pipiens quinquefaciatus), the genomic sequence of pathogenic bacteria transmitted by plant pests, as well as demonstrating the involvement of RNA interference in insect immunity. Within the United States the recent spread of the West Nile virus demonstrates how rapidly insect-vectored disease can move through large geographic regions despite the presence of sophisticated and well-established vector control policies.

The effect of climate change on the distribution of both disease vectors and the pathogens they transmit is unknown but demands investigation since the impact of an expanded disease distribution could have significant impacts on agriculture in California and the U.S., as well as on human health and welfare in countries in which the current disease burden is small.

Education

OPPORTUNITIES FOR GRADUATE TRAINING

CDVR faculty provide graduate training for students leading to either the MS or PhD degrees in a range of fields shown below. Some of the programs are departmental-based while others are "umbrella" programs that contain courses taught by faculty from a number of departments. Depending on the student's interests, a program can be chosen which is tailored to the individual goals of the student. All aspects of arthropod-borne disease can be covered within the graduate programs offered.

GRADUATE STUDIES IN THE CENTER:

- Biomedical Sciences**
medschool.ucr.edu/graduate
- Biochemistry and Molecular Biology**
biochemistry.ucr.edu/
- Cell, Molecular and Developmental Biology**
cell.ucr.edu/
- Entomology**
entomology.ucr.edu/
- Environmental Toxicology**
etox.ucr.edu/
- Genetics, Genomics, Bioinformatics**
ggb.ucr.edu/
- Neuroscience**
neuro.ucr.edu/
- Plant Pathology**
plantpath.ucr.edu/



R. C. Smith, P. W. Atkinson
Transgenic *Aedes aegypti*
(yellow-fever mosquito)

OPPORTUNITIES FOR UNDERGRADUATE TRAINING

Undergraduate training is strongly encouraged in all CDVR laboratories and students are invited to apply through the College website at: <http://cnas.ucr.edu/students/undergraduate/>.

Research Interests

The CDVR brings together diverse faculty with a range of expertise to offer new and innovative approaches to the study and control of insect-borne disease. One example is the spread of Pierce's Disease through California by the Glassy-winged Sharpshooter. Several CDVR labs are exploring the underlying biological interactions that are enabling the rapid spread of this devastating disease. In human health, many insect-vectored diseases, such as malaria and dengue, are resurgent and continue to cause considerable human mortality and morbidity in many developing countries and threaten developed countries in equatorial, sub-equatorial and temperate climates. CDVR faculty have already collaborated on the use of genomics in understanding the DNA sequences of three mosquito species (*Anopheles gambiae*, *Aedes aegypti* and *Culex*



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