

Molecular Targets for Control of Vector-Borne Diseases: Bridging Lab and Field Research (Joint with "Malaria: New Approaches to Understanding Host-Parasite Interactions")

part of the Keystone Symposia Global Health Series, supported by the Bill & Melinda Gates Foundation

April 11–16, 2010 • Copper Mountain Resort • Copper Mountain, Colorado • USA

Scientific Organizers: Kenneth D. Vernick, Elena A. Levashina, Gerry Killeen and Anthony A. James

CONFIRMED PROGRAM FACULTY & TALKS

Serap Aksoy, Yale University School of Medicine, USA

Microbiome Influences on Host Vector Competence

Luke S. Alphey, Oxitec Ltd, UK

Sterile Insects for Vector Control

Nora J. Besansky, University of Notre Dame, USA

Chromosome Structural Polymorphism and the Malaria Transmission System

Debaditya Bhattacharya, Tufts Medical Center, USA

*Development of a Reservoir-Targeted Vaccine against *Yersinia pestis**

William C. Black IV, Colorado State University, USA

*Population Genetics of *Aedes aegypti* and Dengue Transmission*

Catherine Bourgouin, Institut Pasteur, France

Vector-Targeted Immunological Control of Malaria Transmission

Flaminia Catteruccia, Imperial College London, UK

*Molecular Bases of *Anopheles gambiae* Reproductive Biology: A Laboratory and Field Study*

Maureen Coetzee, University of Witwatersrand, South Africa

Insecticides and Malaria Epidemiology

Andrea Crisanti, Imperial College of Science Technology and Medicine, UK

*HEG-Mediated Gene Drive in Caged *Anopheles Gambiae* Mosquito Populations*

Linda De Vooght, Institute of Tropical Medicine, Antwerp, Belgium

*Expression of Trypanosome-Development Inhibitory Proteins into the Periplasm of *Sodalis glossinidius*, a Bacterial Symbiont of the Tsetse Fly*

Gregor Devine, Rothamsted Research, UK

Adult Mosquitos as Insecticide Delivery Agents

Didier Fontenille, IRD, France

Complexity of the Malaria Vectorial System in Africa

Brian D. Foy, Colorado State University, USA

The Effects of Anthelmintics on Anthropophilic Mosquitoes in the Lab and Field

Janet Hemingway, Liverpool School of Tropical Medicine, UK

Biochemistry of Insecticide Resistance

Anthony A. James*, University of California, Irvine, USA

Transgenic Strategies for Pathogen Transmission Control

Hirotsuka Kanuka, Obihiro University of Agriculture and Veterinary Medicine, Japan

*Midgut Bacteria Regulates Plasmodium Development in Malaria Vector *Anopheles* Mosquitoes*

Gerry Killeen, Ifakara Health Research and Development Centre, Tanzania

Ecology: A Prerequisite for Malaria Elimination and Eradication

Bart Knols, Academic Medical Centre, Amsterdam, The Netherlands

Entomopathogenic Fungi as a Malaria Biocontrol Tool

Louis Lambrechts, Institut Pasteur, France

Genetic Specificity of Interactions between Dengue Viruses and Mosquito Vectors

Gregory Lanzaro, University of California, Davis, USA

*The Genetic Structure of *Anopheles Gambiae* Populations*

Brian P. Lazzaro, Cornell University, USA

*Evolution of *Anopheles* Immune Defense Genes*

Christian Lengeler, Swiss Tropical and Public Health Institute, Switzerland

From Technology Development and Field Validation to Large-Scale Vector Control Interventions

Elena A. Levashina, Institut de Biologie Moleculaire et Cellulaire, France

*Complement-like system in immune responses of *Anopheles gambiae**

Luciano Andrade Moreira, University of Queensland, Australia

*A *Wolbachia* Symbiont in *Aedes aegypti* Limits Infection with Dengue, Chikungunya and Plasmodium*

Judith Lum Ndamukong, University of Buea, Cameroon

Biting Densities and Transmission Potential of Malaria Vectors in the Mount Cameroon Region at Contrasting Altitudinal Zones

Kenneth E. Olson, Colorado State University, USA

Interactions between Arboviruses and the Mosquito's RNAi Pathway

Ramavati Pal, Victoria University of Wellington, New Zealand

Insect Glutathione S-transferase Proteome and Insecticide Resistance

Alexander S. Raikhel, University of California, Riverside, USA

Mosquito Immune Signaling Pathways

Hilary Ranson, Liverpool School of Tropical Medicine, UK

The Molecular Genetics of Insecticide Resistance in Mosquitoes

Andrew Read, Penn State University, USA

Evolution-Proofing Existing Malaria Control Tools

Robert E. Sinden, Imperial College London, UK

Cell Biology of Plasmodium in the Vector

Willem Takken, Wageningen University, The Netherlands

Olfaction and Behavioral Ecology of Disease Vectors

Kenneth D. Vernick, Institut Pasteur, France

Mapping and Functional Dissection of Mosquito Resistance to Plasmodium

Laurence J. Zwiebel, Vanderbilt University, USA

Olfactory and Thermosensory Genomics as a Basis for Disrupting Disease Transmission by Vector Mosquitoes



Vigorous research since the completion of the *Anopheles gambiae* genome sequence has established the malaria mosquito as a model organism for host-pathogen biology. However, the translation of this growing post-genomic knowledge base into new vector-targeted malaria control strategies is a distinct challenge that now leads laboratory-based molecular researchers to confront the complexity and heterogeneity of the natural malaria transmission system. Simultaneously, a body of field-based vector researchers has been developing new ways to utilize existing vector control tools such as bednets and insecticides that, if consistently implemented, can yield impressive outcomes. Lab and field-based practitioners attend different meetings and rarely engage in direct dialog. This conference will examine the tension between the development of new practical malaria control tools, including genomic ones, and the advantages of more fully exploiting existing tools. It is hoped that the scientific discussion will help influence individual and programmatic research priorities.

PROGRAM PLENARY SESSIONS:

- Vector Populations
- Olfaction, Host Seeking and Behavior
- Insecticides and Resistance
- Pathogen Receptors and Cellular Interactions
- Host-Parasite Evolution
- Insect Immunity
- Control Strategies – Current and Future

DEADLINES:

Early Registration: February 11, 2010

www.keystonesymposia.org/10F2

*Keynote speaker.

Program subject to change. Current as of February 9, 2010.

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