

Join Keystone Symposia for
the 2015 conference on:

The Arthropod Vector: The Controller of Transmission

May 12–17, 2015

Sagebrush Inn and Conference Center
Taos, New Mexico, USA

Scientific Organizers: Serap Aksoy, Stephen K. Wikel and David S. Schneider

Organizing Committee: Adriana Costero-Saint Denis, Tonu M. Wali and Wolfgang Leitner

*Vector innate immunity studies have been ongoing for about a decade, and the field has advanced understanding of the complex interactions between pathogens and vectors. Vector **saliva** contains powerful molecules with translational potential, and vectors also ingest various **bioactive factors of human origin** which affect the development and survival of pathogens within the vector. This meeting integrates the multiple levels of influence on disease transmission by the arthropod vector. Its goal is to translate immunological and microbiological insights into new approaches for combating vector-borne diseases, including manipulation of the microbiome and identification of novel, non-traditional vaccine targets, such as arthropod saliva proteins.*

Session Topics:

- Innate Immunity: Models and Midguts
- Innate Immunity: From Cells to Host Factors
- Microbiota of Vectors: The New Frontier?
- Microbiome Impact on Innate Immunity
- The Use of Symbionts to Prevent Transmission
- Vector Spit: from Alchemy to Public Health Solutions
- Saliva Proteins to Prevent and Track Transmission
- Novel Approaches to Disease Control



Discounted Abstract/Scholarship Deadline: Jan 13, 2015
Abstract Deadline: Feb 11, 2015
Discounted Registration Deadline: March 11, 2015

To see the full program and for additional details,
visit www.keystonesymposia.org/15E2.

KEYSTONE  SYMPOSIA™
on Molecular and Cellular Biology
Accelerating Life Science Discovery

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TUESDAY, MAY 12

Arrival and Registration

WEDNESDAY, MAY 13

Welcome Remarks

***Serap Aksoy**, Yale University School of Public Health, USA

***Adriana Costero-Saint Denis**, NIAID, National Institutes of Health, USA

Keynote Address

Shirley Luckhart, University of California, Davis, USA
Six Degrees of Separation: Shared Biology to Empower Novel Translational Approaches to Vector-Borne Disease Control

Innate Immunity: Models and Midguts

***Kristin Michel**, Kansas State University, USA

***Michael A. Riehle**, University of Arizona, USA

Bruno Lemaître, École Polytechnique Fédérale de Lausanne, Switzerland
The Drosophila Antimicrobial Response at the Time of the Cas9/CRISPR Gene Targeting Revolution

Carolina V. Barillas-Mury, NIAID, National Institutes of Health, USA
Anopheles/Plasmodium Interactions: The Tale of the Invisible Parasite!

B. Joseph Hinnebusch, NIAID, National Institutes of Health, USA
Short Talk: Comparative Evaluation of Two Ways that Fleas Transmit Yersinia pestis

Rushika Perera, Colorado State University, USA
Short Talk: Metabolic Pathways that May Regulate Vector Competence in Aedes aegypti during Dengue Virus Infection

Daniel P. Dulebohn, Rocky Mountain Laboratories, NIAID, National Institutes of Health, USA
Short Talk: Analyzing the Role of Histidine Kinase-2 in Spirochete Transmission from Ticks

Berlin Londono-Renteria, Kansas State University, USA
Short Talk: Effect of Human Complement on Dengue Virus Infectivity in Aedes aegypti Midgut

Barbara S. Drolet, USDA, Agricultural Research Service, USA
Short Talk: Immunomodulatory Effects of Culicoides Blood Feeding: A Murine Model

Workshop 1

***David S. Schneider**, Stanford University School of Medicine, USA

***Ulrike Munderloh**, University of Minnesota, USA

Jacob I. Meyers, Texas A&M University, USA
Mosquitocidal Properties and Antibody Passage of IgG Targeting the Glutamate-Gated Chloride Channel of Three Diverse Mosquito Disease Vectors

Dana K. Shaw, University of Maryland, School of Medicine, USA
Non-Canonical Activation of the Immune Deficiency Pathway in Ticks

Jose E. Pietri, University of California, Davis, USA
Two Insulin-Like Peptides Regulate Resistance to Plasmodium falciparum Infection in Anopheles stephensi through Distinct Effects on Immunity, Metabolism and Midgut Homeostasis

Jose Luis Ramirez, NIAID, National Institutes of Health, USA
Molecular Mechanisms Mediating Innate Immune Priming in An. gambiae Mosquitoes

Mathilde Gendrin, Imperial College, UK
Antibiotics in Ingested Human Blood Affect the Mosquito Microbiota and Capacity to Transmit Malaria

Gong Cheng, Tsinghua University, China
A Transmission-Blocking Vaccine Strategy for Dengue Prevention

Jiannong Xu, New Mexico State University, USA
Identification of CRISPR/Cas Systems in the Mosquito Gut Microbiome: Implications for the Ecological Phage-CRISPR Interactions

Karina Mondragon-Shem, Liverpool School of Tropical Medicine, UK
Sweet Mysteries: Unravelling the Salivary Glycome of Sandflies

Innate Immunity: From Cells to Host Factors

***Carolina V. Barillas-Mury**, NIAID, National Institutes of Health, USA

***Bruno Lemaître**, École Polytechnique Fédérale de Lausanne, Switzerland

Michael R. Strand, University of Georgia, USA
Vector-Microbiome Interactions: Impacts on Mosquito Immunity and Development

Kristin Michel, Kansas State University, USA
Immunomodulation Therapy to Control Mosquito Vectors

Michael A. Riehle, University of Arizona, USA
The Effects of Ingested Mammalian Blood Factors on Vector Arthropod Immunity and Physiology

Ondrej Hajdusek, Institute of Parasitology, Czech Republic
Short Talk: Tick Immune System and its Interaction with the Transmitting Pathogens

Veronika Urbanova, Biology Centre ASCR, v.v.i., Czech Republic
Short Talk: Complement System of the Ticks and its Role in the Immune Response to Borrelia

Poster Session 1

THURSDAY, MAY 14

Microbiota of Vectors: The New Frontier?

***Elizabeth A. McGraw**, Monash University, Australia

***Jason L. Rasgon**, Pennsylvania State University, USA

Angela E. Douglas, Cornell University, USA
How the Taxonomic and Functional Diversity of Gut Microbiota Shapes Insect Traits

Serap Aksoy, Yale University School of Public Health, USA
Insights into the Microbiome of a Viviparous Dipteran

George Dimopoulos, Johns Hopkins University, USA
Exploring the Mosquito Microbiome for Disease Control

Sassan Asgari, University of Queensland, Australia
Role of MicroRNAs in Regulation of Symbiont-Pathogen Interactions in a Vector System

Kerri L. Coon, University of Georgia, USA
Short Talk: Specific Gut Bacteria Promote Autogeny in Mosquitoes

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Daniel LePage, Vanderbilt University, USA
Short Talk: Investigating the Genetic Basis of Wolbachia-Induced Cytoplasmic Incompatibility

Microbiome Impact on Innate Immunity

***Angela E. Douglas**, Cornell University, USA

***Sassan Asgari**, University of Queensland, Australia

Nicole M. Gerardo, Emory University, USA
The Intersection of Symbionts, Pathogens and Immunity in Insect Systems

Zhiyong Xi, Michigan State University, USA
Interaction of Mosquito Immunity with Wolbachia and its Impact on Symbiosis Establishment and Vector Competence for Malaria and Dengue Virus

Rod Dillon, Lancaster University, UK
The Gut Microbiome of Lutzomyia Sand Flies

Zhee Sheen Wong, University of Pittsburgh, USA
Short Talk: Oxidative Stress Correlates with Wolbachia-Mediated Antiviral Protection in Naturally Infected Insects

Brian L. Weiss, Yale School of Public Health, USA
Short Talk: An Endosymbiont-Regulated Tsetse Odorant Binding Protein Mediates Host Immune System Maturation Processes

Poster Session 2

FRIDAY, MAY 15

The Use of Symbionts to Prevent Transmission

***Nicole M. Gerardo**, Emory University, USA

***Rod Dillon**, Lancaster University, UK

Marcelo Jacobs-Lorena, Johns Hopkins Bloomberg School of Public Health, USA
Fighting Malaria with Engineered Symbiotic Bacteria from Vector Mosquitoes

Ulrike Munderloh, University of Minnesota, USA
Paratransgenic Approaches to Manipulate Tick Infectivity

Pamela Pennington, Universidad del Valle de Guatemala, Guatemala
Applying Paratransgenic Approaches to Control Disease

Jason L. Rasgon, Pennsylvania State University, USA
Microbiome as a Driving Mechanism for Gene Spread

Elizabeth A. McGraw, Monash University, Australia
Short Talk: Wolbachia Affects Dengue Virus Infection Dynamics in the Mosquito

Christine L. Sansone, University of Pennsylvania, USA
Short Talk: Microbiota-Dependent Activation of Antiviral Intestinal Immunity in Drosophila

Sarah M. Short, Johns Hopkins University, USA
Short Talk: Investigating Mosquito Molecular Factors that Control Gut Microbiota Variability in Aedes aegypti

Vector Spit: From Alchemy to Public Health Solutions

***Esther von Stebut-Borschitz**, Johannes Gutenberg University, Germany

***Jan Van den Abbeele**, Institute of Tropical Medicine Antwerp, Belgium

Stephen K. Wikel, Quinnipiac University, USA
Vector Saliva: A Powerful Immunomodulator

Jesus G. Valenzuela, NIAID, National Institutes of Health, USA
Basic and Translational Research on Sand Fly Saliva: From Pharmacology to Biomarkers and Vaccines

João Pedra, University of Maryland School of Medicine, USA
Mitigation of Nod-Like Receptor Sensing by a Tick Salivary Protein

Erol Fikrig, Yale University School of Medicine, USA
Keynote Address: The Translation of Saliva Proteins into Tools to Prevent Vector-Borne Disease Transmission

Poster Session 3

SATURDAY, MAY 16

Saliva Proteins to Prevent and Track Transmission

***Stephen K. Wikel**, Quinnipiac University, USA

***João Pedra**, University of Maryland School of Medicine, USA

Esther von Stebut-Borschitz, Johannes Gutenberg University, Germany
Immune Cells in the Human Skin: Modulatory Properties of Vector Saliva

Jan Van den Abbeele, Institute of Tropical Medicine Antwerp, Belgium
Using Tsetse Fly Saliva Proteins as Biomarkers of Vector Exposure

Franck Remoue, UMR 224 MIVEGEC, France
Epidemiological Applications of Assessing Mosquito Exposure in a Malaria-Endemic Area

Shaden Kamhawi, NIAID, National Institutes of Health, USA
Unique Features of Vector-Transmitted Leishmaniasis and their Relevance to Disease Progression and Control

Guy Caljon, University of Antwerp, Belgium
Short Talk: Early Immunological Responses upon Tsetse Fly Mediated Trypanosome Inoculation

Donald Champagne, University of Georgia, USA
Short Talk: Characterization of a Lymphocyte-Depleting Factor in Saliva of the Yellow Fever Mosquito, Aedes aegypti

Dennis A. Bente, University of Texas Medical Branch, USA
Short Talk: Early Pathogenesis of Crimean-Congo Hemorrhagic Fever: Tick Salivary Gland Extract Immunomodulates Human Cutaneous Antigen-Presenting Cell Response to Infection

Panel

***Tonu Wali**, NIAID, National Institutes of Health, USA

***Wolfgang W. Leitner**, National Institute of Allergy and Infectious Diseases, NIH, DHHS, USA

Shaden Kamhawi, NIAID, National Institutes of Health, USA

Shirley Luckhart, University of California, Davis, USA

Michael R. Strand, University of Georgia, USA

Marcelo Jacobs-Lorena, Johns Hopkins Bloomberg School of Public Health, USA

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Novel Approaches to Disease Control

***Serap Aksoy**, Yale University School of Public Health, USA

***George Dimopoulos**, Johns Hopkins University, USA

Matthew B. Thomas, Pennsylvania State University, USA

Novel Strategies for Delivery of Bioactives Against Adult Malaria Mosquitoes in Field Settings

Luciano A. Moreira, Instituto de Pesquisas René Rachou-Fiocruz, Brazil

Using an Endosymbiont to Control Dengue

David S. Schneider, Stanford University School of Medicine, USA

Tracing the Path Hosts Travel through "Disease Space"

Meeting Wrap-Up

Serap Aksoy, Yale University School of Public Health, USA

Adriana Costero-Saint Denis, NIAID, National Institutes of Health, USA

SUNDAY, MAY 17

Departure