

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Vector Biology: Emerging Concepts and Novel Technologies (Q4)

Scientific Organizers: João Pedra, Elena A. Levashina and Maria-Carla Saleh

Supported by the Directors' Fund

Skin-Immune Crosstalk (Q3)

Scientific Organizers: Anna Di Nardo, Daniel H. Kaplan and Nathalie Boulanger

February 13-16, 2023 • Beaver Run Conference Center • Breckenridge, CO, USA

Supported by the Directors' Fund

Global Health Travel Award Deadline: November 3, 2022 / Scholarship Deadline: November 28, 2022 / Abstract Deadline: November 28, 2022 / Discounted Registration Deadline: December 14, 2022

MONDAY, FEBRUARY 13

Arrival and Registration (4pm Start)

TUESDAY, FEBRUARY 14

Welcome and Keynote Address (8am Start) (Q4)

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

Manu Prakash, Stanford University, USA

Remote Presentation: Mosquitoes Meet Microfluidics: High

Throughout Low-Cost Tools for Molecular Surveillance of Vectors and Pathogens

Welcoming Remarks from Organizers and Keynote Address (8am Start) (Q3)

Lisa A. Beck, University of Rochester Medical Center, USA

Success Story Going from the Basic Science of Atopic Dermatitis all the way Through to the Development of Game Changing New Therapy

Transgenesis, Synthetic Biology and Machine Learning (9am Start) (Q4)

Omar S. Akbari, University of California, San Diego, USA
Synthetic Biology and Mosquitoes

***Monika Gulia-Nuss**, University of Nevada, USA
Genetic Tools for Tick and Tick-Borne Diseases Management

Felix Hol, Radboud University Medical Center, Netherlands
Short Talk: High-throughput Deep Behavioral Phenotyping of Dengue-virus infected Aedes Aegypti Reveals Transmission-enhancing Changes in Blood Feeding Behavior

Immune Microbiome Crosstalk at the Skin (9am Start) (Q3)

***Tiffany C. Scharschmidt**, University of California, San Francisco, USA

Early Life Bacterial-Immune Interactions in Skin

Richard L. Gallo, University of California, San Diego, USA
Microbial Control of Skin Innate Immunity

Roberto Ricardo Gonzalez, University of California, San Francisco, USA
Immune Control of Demodex Mites

Victoria Lovins, University of Pennsylvania, USA
Short Talk: Investigating the Role of Staphylococcus Aureus Strain-level Diversity on Neutrophil Recruitment and Wound Healing in a Cutaneous Leishmaniasis Infection

Workshop 1: Immunobiology and Metabolism (2:30pm Start) (Q4)

***Dana K. Shaw**, Washington State University, USA

Patricia Y. Scaraffia, Tulane University, USA
Advancing our Understanding of Aedes Aegypti Metabolism using Classical and Cutting-edge Technologies

Agustin Rolandelli, University of Maryland School of Medicine, USA
The Gene Expression Landscape of Ixodes Scapularis Hemocytes at Single-cell Resolution

Oshani Chathurangika Ratnayake, Colorado State University, USA
Investigating Remodeling of Metabolic Homeostasis in the Mosquito Vector during Arbovirus Infections

Yu-Min Chuang, Yale University, USA

Signaling Between Mammalian Adiponectin and a Mosquito Adiponectin Receptor Reduces Plasmodium Transmission

Paolo Gabrieli, Università degli Studi di Milano, Italy
The Insect Saliva as Modulator of the Mosquito Biting Behavior

Alan G. Goodman, Washington State University, USA

Anti-viral Insulin Signaling during Zika and West Nile Virus Infections

Workshop 1: Skin Antibiotics and the Immune System (2:30pm Start) (Q3)

***Richard L. Gallo**, University of California, San Diego, USA
Session Chair

Alexandria Wells, NIAID/NIH, USA

Adaptive Immunity to Ancient Retroelements Controls the Skin Tissue Threshold of Activation

Najla Nasr, Westmead Institute for Medical Research, University of Sydney, Australia
Characterising Plasmacytoid and Myeloid AXL SIGLEC6 Dendritic Cells Responses in Initial HIV Infection

Xintong Dong, University of Texas Dallas, USA
Genetic Dissection of Antimicrobial Peptide Signaling in Skin Infection and Inflammation

Sang Hun Lee, NIAID, National Institutes of Health, USA
MRhiMHCII- dermis Resident Macrophages Orchestrate Localized ILC2-eosinophil Circuitries to Maintain M2-like Properties in Cutaneous Leishmaniasis

Michael Battaglia, SUNY at Buffalo, USA

Ets1 Cooperates with IL17RA Signaling to Control Staphylococcus Aureus Skin Infection

Imke Visser, Erasmus MC, Netherlands

Differential Effect of Mosquito Saliva from Distinct Species on Human Dermal Endothelial Cell Function

Sam Verwimp, Rega Institute for Medical Research, KU Leuven, Belgium

Depletion of Host Skin Bacteria by Topical Antibiotic Treatment of the Skin Aggravates the Disease Outcome of Zika Virus Infections in Mice

Charlotte Cook, Pirbright Institute, UK

Stomoxys Calcitrans Feeding Activity Influences the Kinetics of Lumpy Skin Disease

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Microbial Ecology and Vector Genetics (5pm Start) (Q4)

Utpal Pal, University of Maryland College Park, USA
Mammal-arthropod Crosstalk Integrates Tick Immunity and Development

***Louis Lambrechts**, Institut Pasteur, France
Mosquito-Arbovirus Interactions

Pamela Pennington, Universidad del Valle de Guatemala, Guatemala
Kissing Bugs and Chagas Disease

João Trindade Marques, Universidade Federal de Minas Gerais, Brazil
Short Talk: Mosquito Vector Competence for Dengue is Modulated by Insect Specific Viruses

Paola Carrillo-Bustamante, Max Planck Institute for Infection Biology, Germany
Short Talk: How Does Climate Affect the Evolution of Mosquito-transmitted Pathogens?

Dermal Mechanism of Host Defense: Mast Cells (5pm Start) (Q3)

Stephen J. Galli, Stanford University, USA
Mast Cell Biology at the Skin Interface: Combating Venoms and Bacteria

Xinzhong Dong, Johns Hopkins University, USA
MrgprB2 in Mast Cells Detects Bacterial Quorum Sensing Molecules and Mediates Antibacterial Immunity

***Anna Di Nardo**, University of California, San Diego, USA
Dermal Mast Cell and Skin Microbiome

Tina L. Sumpter, University of Pittsburgh, USA
Short Talk: Blockade of the ATP Binding Cassette Subfamily A Member 1 Reduces Mast Cell-initiated Inflammation in the Skin

Yue Xing, NYU Grossman School of Medicine, USA
Short Talk: Hyperactive $\gamma\delta$ T17 Cells Uniquely Drive Neonatal Hypersensitivity to Allergens

Poster Session 1 (7:30pm Start)

WEDNESDAY, FEBRUARY 15

Vector-Borne Pathogens at the Skin Interface (Joint) (8am Start)

***Nathalie Boulanger**, Institut de Bacteriologie, France

Guy Caljon, University of Antwerp, Belgium
Tsetse Transmitted Trypanosomes: From the Skin to a Systemic Infection

***Sukanya Narasimhan**, Yale School of Medicine, USA
The Sweet Side of Tick-host Interactions

Jesus G. Valenzuela, NIAID, National Institutes of Health, USA
Skin Responses to Vector Derived Factors

Julien Pompon, IRD, France

Short Talk: Phospholipids in Mosquito Saliva are a New Class of Transmission Enhancing compounds for flaviviruses

Hacène Medkour, CNRS, France

Short Talk: Mosquito Bite-Initiated Skin Infection by Flaviviruses at the Single Cell Level

Workshop 2: Microbiome, Symbionts and Pathogens (2:30pm Start) (Q4)

Rebecca M. Johnson, Connecticut Agricultural Experiment Station, USA
Blood Feeding Dynamics Reflective of Mosquito Behavior in the Wild Alter Dengue Virus Dissemination in Aedes Aegypti

***Eric Caragata**, University of Florida, USA
Larval Competition Stress and Wolbachia Infection Shape Fitness and West Nile Virus Infection in Culex Guinefasciatus

Emily Gallichotte, Colorado State University, USA
WNV and SLEV Coinfection in Avian and Mosquito Hosts: Virus Replication, Virus Competition, and Virus-virus Interactions

Cassandra Koh, Institut Pasteur, France
Decoding rRNA Sequences for Improved Metagenomics of Sylvatic Mosquito Species

Rachel E. Lange, UAlbany School of Public Health, USA
Role of Ixodes Scapularis in Powassan Virus Host-specificity and Adaptation

Fatimoudou Tandina, Université des Sciences Techniques et des Technologies de Bamako, Mali
The Impact of Feeding Method on Anopheles Mosquito Midgut Microbiota and Plasmodium falciparum Infection Rates

Workshop 2: MRG Receptors and Skin Immunity (2:30pm Start) (Q3)

***Xinzhong Dong**, Johns Hopkins University, USA
Session Chair

Dustin P. Green, UTMB, USA
Connective Tissue Mast Cells and their Role in Pain

Sabrina de Souza, Michigan State University, USA
Mast Cells are Necessary for the Resolution of Pain Hypersensitivity after Surgical Skin Incision or Skin Inflammation

Naina Gour, Johns Hopkins University, USA
GPCR-neuropeptide Axis Regulates Neutrophil Polarization

Juan Manuel Leyva-Castillo, Boston Children's Hospital, Harvard Medical School, USA
Basophils Play a Protective Role in Skin Barrier Function Recovery

Caterina Curato, German Federal Institute for Risk Assessment, Germany
Induction of Type IV Hypersensitivity in a Red Tattoo Induced by Subcutaneous immunotherapy: a case report

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Laura Marie Gail, Medical University of Vienna, Austria
Regulation of T Cell Tissue Residency in the Skin after Hematopoietic Stem Cell Transplantation

Eric Smith Weiss, University of Pittsburgh, USA
Cognate Antigen Encounter in Skin is Required for Full Differentiation of Epidermal Resident Memory T Cells

Immunobiology and Metabolism (5pm Start) (Q4)

***Meghan Hermance**, University of South Alabama, USA

Elena A. Levashina, Max Planck Institute for Infection Biology, Germany
Mosquito Immunity

Maria-Carla Saleh, Institut Pasteur, France
Antiviral Immunity in Insects

João Pedra, University of Maryland School of Medicine, USA
Tick Extracellular Vesicles and Skin Immunity

Anya J. O'Neal, University of Maryland, Baltimore, USA
Short Talk: The CD36 Homolog Croquemort Binds Infection-derived Lipids and Initiates Antibacterial Immunity in Ixodes Scapularis

Kevin Maringer, Pirbright Institute, UK
Short Talk: Flavivirus Evasion of Mosquito NF- κ B-mediated Innate Immunity Defines Vector Specificity and Emergence Potential

Cutaneous T Cell-Dendritic Cell interactions (5pm Start) (Q3)

Muzlifah A. Haniffa, Wellcome Sanger Institute, UK
Human Mononuclear Phagocytes and Dendritic Cells in Human Health and Disease

Christina Elisabeth Zielinski, Leibniz Institute for Natural Product Research & Infection Biology, Germany
Human T Cells in Skin Lockdown - Lessons from Clinical Models

***Niroshana Anandasabapathy**, Weill Cornell Medicine, USA
Peripheral Immune Tolerance and DC:T Cell Cross Talk

Jiang Zhang, Brigham And Women's Hospital, USA
Short Talk: Nociceptor Sensory Neurons Promote CD8 T cell Response to VACV Infection

Michela Frascoli, University of Massachusetts Chan Medical School, USA
Short Talk: Crosstalk between Skin Homing Innate T Cells and Epithelial Cells via Cholesterol Byproduct Messengers is Required for Tissue Immunity

Poster Session 2 (7:30pm Start)

THURSDAY, FEBRUARY 16

Skin-Vector Borne Diseases: Novel Approaches to Diagnosis, Vaccines and Therapeutics (Joint) (8am Start)

***Saravanan Thangamani**, SUNY Upstate Medical University, USA

Yasmine Belkaid, NIAID, National Institutes of Health, USA
The Influence of Skin Microbiota at the Cutaneous Immunity

Nathalie Boulanger, Institut de Bacteriologie, France
Proteomics to Identify Pathogen Candidates for Vaccines and Diagnosis at the Skin Interface

Fiona Kuo, RAPT Therapeutics, USA
Novel Therapeutic Approaches to Atopic Dermatitis

***Anne C. Moore**, University College Cork, Ireland
Microarray Patches to Vaccinate at the Skin Interface

Alexandra Francian, University of New Mexico, USA
Short Talk: VLP-based Vaccines Targeting Mosquito Salivary Co-factors for Disease Transmission

Shrey A. Shah, University of Maryland, USA
Short Talk: Profiling the Immune Interaction between Microneedle Matrices and Cargo with the Skin

Behavior, Physiology and Reproduction (5pm Start) (Q4)

Leah Hourii-Zeevi, Rockefeller University, USA
Mosquitoes, Love, Memory: Genetic Programs Towards a Lifetime of Behavior in Aedes Aegypti Females

***Geoffrey Michael Attardo**, University of California, Davis, USA
Tsetse Reproduction and Metabolism

Kevin R. Macaluso, University of South Alabama, USA
Rickettsial Influence on Vector Physiology

Neuroimmune Crosstalk in the Skin (5pm Start) (Q3)

Isaac Chiu, Harvard Medical School, USA
Recognition of Pathogens by Cutaneous Nociceptors

***Daniel H. Kaplan**, University of Pittsburgh, USA
Immune Function of Cutaneous Sensory Neurons

Brian Kim, Mount Sinai, USA
Neuroimmune Regulation of Itch

Juan Inclan Rico, University of Pennsylvania, School of Veterinary Medicine, USA
Short Talk: MrgprA3 neurons Selectively Control Myeloid-derived IL-33 for IL-17 Dependent Cutaneous Immunity

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (6:45pm Start) (Q4)

Meeting Wrap-Up: Outcomes and Future Directions (Organizers) (6:45pm Start) (Q3)

FRIDAY, FEBRUARY 17

Departure