

KEYSTONE SYMPOSIA

on Molecular and Cellular Biology

Helminths: New Insights from Immunity to Global Health (T4)

December 8-12, 2019 • Southern Sun Cape Sun • Cape Town, Western Cape, South Africa
Scientific Organizers: De' Broski Herbert, P'ng Loke, Nicola L. Harris and Frank Brombacher
Part of the Keystone Symposia Global Health Series, supported by the Bill & Melinda Gates Foundation

Global Health Travel Award Deadline: July 9, 2019 / Discounted Abstract & Scholarship Deadline: August 8, 2019 / Abstract Deadline: September 24, 2019 / Discounted Registration Deadline: October 10, 2019

SUNDAY, DECEMBER 8

Arrival and Registration

MONDAY, DECEMBER 9

Welcome and Keynote Address

***De' Broski R. Herbert**, University of Pennsylvania, USA

David Artis, Cornell University, USA

Regulation of Type 2 Immunity at Barrier Surfaces

Epithelial Cells and ILC2s in Helminth Infection

***Nicola L. Harris**, Monash University, Australia

***William Horsnell**, University of Cape Town, South Africa

Amy H. Buck, University of Edinburgh, UK

RNA Communication in the Gut: New Mechanisms of Host Modulation by Helminths

Menno J. Oudhoff, Norwegian University of Science and Technology, Norway

Short Talk: AI-Based Organoid Image Analysis Combined with Cell Compositional and Transcriptome Analysis to Define Type II Epithelial Responses

Jakob H. von Moltke, University of Washington, USA

Small Intestinal Tuft Cells: Sentinels and Effectors of Type 2 Immunity

David Voehringer, University Hospital of Erlangen, Germany

Short Talk: Control of Intestinal Helminth Infections by Epithelial Cells and Alternatively Activated Macrophages

De' Broski R. Herbert, University of Pennsylvania, USA

LINGO Proteins Control Helminth Immunity at the Mucosal Interface

Workshop 1

***Jakob H. von Moltke**, University of Washington, USA

***Sara Lustigman**, New York Blood Center, USA

Bonnie Douglas, University of Pennsylvania, USA

Using a Transgenic 2W1S-Expressing Gastrointestinal (GI) Nematode to Evaluate Antigen-Specific CD4+ T Cell Function during Helminth Infection

Pedro Gazzinelli-Guimaraes, National Institutes of Health, USA

IL-5 Producing CD4 Th2 Cells and IL-13/IL-13Ra1 Signaling Axis Driven by Pulmonary Allergic Inflammation Promote an Eosinophil-Dependent Arrest on Helminth Larval Development in the Lungs

Nada Abdel Aziz, Cairo University, Egypt

IL-4Ra Signaling on Foxp3+ Regulatory T Cells in Controlling Helminth-Induced Tissue Damage

Paballo Pertunia Mosala, University of Cape Town, South Africa

Cysteinyl Leukotriene Receptor-1 Mediates Worm Expulsion Following Nippostrongylus Brasiliensis Infection in Mice

Jacqueline Araujo Fiuza, René Rachou Institute, Brazil

The Role of Microbial Translocation in the Pathogenesis of S. Mansoni Associated Morbidity

Aldian Irma Amaruddin, Leiden University Medical Center, Netherlands

Helminth Infection and the Gut Microbiome in High and Low Socioeconomic School Children in Urban Area in Makassar, Indonesia

Thabo RV Mpotje, University of Cape Town, South Africa

Intestinal Microbiota Drives Host Susceptibility to Chronic Schistosoma Mansoni Infection in Murine Models

Maternal and Microbial Regulation of Helminth Infection

***Richard M. Maizels**, University of Glasgow, UK

***Elia Tait Wojno**, University of Washington, USA

Richard K. Grencis, University of Manchester, UK

Microbiota, Whipworm Infection and Immune Regulation

William Horsnell, University of Cape Town, South Africa

Short Talk: Pre-Conception Maternal Helminth Infection Transfers via Nursing Long Lasting Cellular Immunity against Helminths to Offspring

Ken H. Cadwell, New York University School of Medicine, USA

Mechanisms of Helminth-Microbiota Interactions

Maria Yazdanbakhsh, Leiden University Medical Center, Netherlands

Modulation of Human Disease by Helminth-Microbiota Interactions

Hermelijn H. Smits, Leiden University Center, Netherlands

Short Talk: Alterations in Microbiome Composition and Intestinal Permeability during Chronic Murine Schistosomiasis: Consequences for Immune Polarisation?

Poster Session 1

TUESDAY, DECEMBER 10

Helminth Biology and Genetics

***Philip T. LoVerde**, University of Texas Health Science Center, USA

***Coralie Martin**, Natural History Museum, France

James Collins, University of Texas Southwestern Medical Center, USA

Sex, Drugs, and Snails: Molecular Studies of Schistosome Biology

Tim J.C. Anderson, Texas Biomedical Research Institute, USA

Genetic Analysis of Adaptive Traits in a Surprisingly Tractable Human Parasite

Dror Avni, Sheba Medical Center, Israel

Short Talk: Schistosomes Extracellular Vesicles miRNAs: Modulators of Host T Helper (CD+) Cell Differentiation

Makedonka Mitreva, Washington University School of Medicine, USA

Applied Multi-Omics: Identifying Inhibitors that Target the Parasitic Nematodes Intestine

Elissa A. Hallem, University of California, Los Angeles, USA

Host-Seeking Behaviors of Skin-Penetrating Nematodes

Epidemiology and Ecology of Helminth Infections

***Jennifer Keiser**, Swiss Tropical and Public Health Institute, Switzerland

***Frank Brombacher**, International Center for Genetic Engineering and Biotechnology, South Africa

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Andrea L. Graham, Princeton University, USA
Ecological Determinants of Helminth Susceptibility and the Duration of Infection

Philip J. Cooper, St George's, University of London, UK
Epidemiology of Soil Transmitted Helminth Infections

Taryn A. McLaughlin, Emory University, USA
Short Talk: Adults from Kisumu, Kenya Have Robust $\gamma\delta$ T Cell Responses to Schistosoma Mansoni Adult Worms Which Are Modulated by Tuberculosis

Benjamin Dewals, University of Liege - FNRS, Belgium
Short Talk: Helminth Infection Is Associated with the Accumulation of Lung Interstitial Macrophages and Increased Susceptibility to Gammaherpesvirus Infection in C57BL/6 Mice

Pritesh Desai, Washington University St. Louis, USA
Short Talk: Coinfection with Enteric Helminths and Neurotropic Flaviviruses Alters Gastrointestinal Tract Functions, Impairs CD8 T Cell Responses, and Results in Lethal Disease

Poster Session 2

WEDNESDAY, DECEMBER 11

Keynote Address

***P'ng Loke**, New York University School of Medicine, USA

Judith E. Allen, University of Manchester, UK
Tissue Repair and Macrophage Activation

Myeloid Cells in Helminth Infection

***David Voehringer**, University Hospital of Erlangen, Germany

***Richard K. Grensis**, University of Manchester, UK

William C. Gause, Rutgers New Jersey Medical School, USA
Myeloid Cell Polarization and Function in Helminth-Induced Type 2 Responses

Elia Tait Wojno, University of Washington, USA
Notch Signaling Controls a Basophil-Th2 Cell Interplay during Helminth Infection

P'ng Loke, New York University School of Medicine, USA
Alternatively Activated Macrophages of Tissue or Monocyte Origin

Bart Everts, Leiden University Medical Center, Netherlands
Short Talk: Unique Metabolic Requirements for Dendritic Cell-Driven T Helper 2 Polarization

Mark C. Siracusa, Rutgers New Jersey Medical School, USA
Short Talk: Host-Protective Responses to Helminth Parasites Are Supported by Dual Mast Cell/Erythrocyte Progenitors

Helminth Control: Drug Development

***Elissa A. Hallem**, University of California, Los Angeles, USA

Philip T. LoVerde, University of Texas Health Science Center, USA
Novel Strategies for Drug Development

Justin Nono Komgwap, Medical Research Centre, Institute of Medical Research and Medicinal Plant Studies, IMPM, Cameroon
Short Talk: Controlling Schistosomiasis: Appraisal of the Scope of Action of Praziquantel, the Only Available WHO-Approved Drug

Severin Donald Kamdem, University of Cape Town, South Africa
Short Talk: Host Genetics Primarily Regulates Liver Fibrosis in Children from Schistosomiasis Endemic Areas in Rural Cameroon

Jennifer Keiser, Swiss Tropical and Public Health Institute, Switzerland
Improved Treatments for Soil-Transmitted Helminthiases

Sabine Specht, Drugs for Neglected Diseases, DNDi, Switzerland
Short Talk: Development of Alternative Treatments against Filarial Diseases

Sitara Swarna Rao Ajjampur, Christian Medical College, India
Short Talk: DeWorm3: Results from the Baseline Survey for Soil-Transmitted Helminths

Poster Session 3

THURSDAY, DECEMBER 12

Keynote Address

***Maria Yazdanbakhsh**, Leiden University Medical Center, Netherlands

Richard M. Maizels, University of Glasgow, UK
Helminth Derived Modulators of Host Immunity

Helminth Control: Vaccine Development

***Alex Loukas**, James Cook University, Australia

***Andrea L. Graham**, Princeton University, USA
Thomas B. Nutman, NIAID, National Institutes of Health, USA
Resistance Against Human Helminth Infection

Yianne Darelle Mouwenda, Leiden University Medical Center, Netherlands
Short Talk: Identification of Immune Network Involved in Helminths Infection and Its Effects on Vaccine Development

Sara Lustigman, New York Blood Center, USA
Onchocerca volvulus Products that Stimulate Immunity

Maria Elena Bottazzi, Baylor College of Medicine, USA
The Road from Basic Biology to Vaccines against Neglected Tropical Diseases: Development and Testing of Anthelmintic Vaccines

Workshop 2

***Mark C. Siracusa**, Rutgers New Jersey Medical School, USA

***Hermelijn H. Smits**, Leiden University Center, Netherlands
Adefunke Esther Ogunkanbi, University of Manchester, UK
Immune-Modulatory Strategies by Mouse Whipworm, Trichuris muris
Norman Nausch, University Hospital Duesseldorf, Germany
The Effects of Mansonella Perstans Infection on Anti-Mycobacterial Immune Responses

Robert Blomgran, Linköping University, Sweden
Beneficial Effects of Helminth Antigen Exposure for the Control of Mycobacterium Tuberculosis Infection in Monocytes and Macrophages, Contrasting the Effect of Chronic Helminth Infection

Cecilia Casaravilla, Universidad de la República, Uruguay
Induction of Regulatory Markers in Macrophages during Chronic Infection by Larval Echinococcus Granulosus Can Be Mimicked by Injection of Particles from the Acellular Larval Coat

Tiffany Bouchery, Monash University AMREP Campus, Australia
The Lipoyxygenase Alox 12/15 Regulates Macrophage Function after Type 2 Polarization in an Arginase-1 Independent Manner

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Juan M. Inclan Rico, Rutgers New Jersey Medical School, USA
Basophils Regulate Innate Lymphoid Cell Responses by Modulating Neuropeptide Receptor Expression

Shuchi Smita, Institute of Life Sciences, India
Adoptive Transfer of ZEB1 Depleted cDC1 Dendritic Cells Clears Helminth Infection In Mice by Enhancing Th2 Responses

Helminth Modulation of Host Immunity

***William C. Gause**, Rutgers New Jersey Medical School, USA

***Judith E. Allen**, University of Manchester, UK

Alex Loukas, James Cook University, Australia
The Hookworm Pharmacopoeia for Inflammatory Diseases

Nicola L. Harris, Monash University, Australia
How Hookworm Escapes Innate Immunity

Richard Edwin Sanya, MRC/UVRI and LSHTM Uganda Research Unit, Uganda

Short Talk: Effect of Helminth Infection and Its Treatment on Metabolic Outcomes: Results of a Cluster-Randomised Trial

Frank Brombacher, International Center for Genetic Engineering and Biotechnology, South Africa

Cysteine Leukotrienes Drive Granulomatous Pathology around Trapped Parasite Eggs during Chronic Schistosomiasis

Katie Smith, Cardiff Institute of Infection and Immunity, UK
Short Talk: Helminth Modulation of Fatty Acid Metabolite Production Promotes Colitis-Associated Colorectal Cancer

Meeting Wrap-Up: Outcomes and Future Directions (Organizers)

FRIDAY, DECEMBER 13

Departure