As a contagious disease, tuberculosis remains endemic in many countries and among vulnerable populations. In these settings, it is a major cause of morbidity and mortality. During the past two decades, there has been a renewed effort to develop vaccines and new antibiotics. However, new discoveries that have transformed our understanding of host susceptibility, immunity and disease pathogenesis have not kept pace with the progress of clinical trials. There is a need for new approaches that can limit the impact of tuberculosis around the world. This symposium will focus on fundamental questions about the host-pathogen interaction, bringing together scientists working on the bacterium and the host in model systems, as well as those trying to address basic questions in human immunology and disease. While answering these questions may not be a prerequisite to clinical progress, an improved mechanistic understanding of the survival and subversion strategies that Mycobacterium tuberculosis employs to evade therapy and host immunity will facilitate development of better strategies to treat and prevent tuberculosis. Specifically, the goals of the meeting are to:

1) Articulate a set of priority questions and goals to guide a basic research agenda for the field; 2) Integrate successful approaches employed by leading scientists in other fields that can address knowledge gaps in immunity to tuberculosis; and 3) Highlight new technical advances that make possible more sophisticated human experimental biology including defining the critical questions that need to be answered to expedite clinical advances.

Session Topics:

- Bacterial Evasion of Immunity
- Workshop: Human Immunology
- How Infected Macrophages Kill Mtbb
- T Cell Immunity
- Failure of T Cell Immunity
- The Genetics of Host-Pathogen Interactions
- Biology at the Host-Pathogen Interface
- T Cell Memory: A Prerequisite to Vaccine Efficacy
- Bugs and Drugs: New Biological Insights Relating to Therapy

Scholarship Application & Discounted Abstract Deadline: September 19, 2016
Abstract Deadline: October 18, 2016
Discounted Registration Deadline: November 15, 2016

Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted. Global Travel Awards are for investigators from low and middle-income countries.
**Workshop: Human Immunology**

- **SAFIRA M. Anderson**, University of California, San Francisco, USA
- **Cecilia S. Lindestam Arlehamn**, Stanford University, USA
- **Malika Davids**, University of Cape Town, South Africa
- **Sharae Basdeo**, Trinity Translational Medicine Institute, Ireland
- **Vojo Deretic**, University of New Mexico Health Sciences Center, USA
- **Volker Briken**, University of Maryland, USA
- **Matthew Knight**, University of California, Berkeley, USA
- **Carolin Turner**, Swiss Federal Institute of Technology in Lausanne, Switzerland
- **Jeroen W. van Heijst**, University of California, San Francisco, USA
- **Chyung-Ru Wang**, Northwestern University Feinberg School of Medicine, USA
- **Lance Liotta**, University of California, San Francisco, USA
- **Larry S. Schlesinger**, Texas Biomedical Research Institute, USA
- **David M. Lewinsohn**, Oregon Health & Science University, USA
- **Samuel M. Behar**, University of Massachusetts Medical School, USA
- **D. J. Ernst**, University of California, San Francisco, USA
- **Andrea M. Cooper**, University of Leicester, UK
- **Patrizia Amolio**, Centre Hospitalier Universitaire Vaudois, Switzerland
- **Matthew Knight**, University of California, Berkeley, USA
- **Volker Briken**, University of Maryland, USA
- **Larry S. Schlesinger**, Texas Biomedical Research Institute, USA
- **Joel D. Ernst**, University of California, San Francisco, USA
- **Samuel M. Behar**, University of Massachusetts Medical School, USA
- **D. J. Ernst**, University of California, San Francisco, USA
- **Andrea M. Cooper**, University of Leicester, UK
- **Patrizia Amolio**, Centre Hospitalier Universitaire Vaudois, Switzerland
- **Matthew Knight**, University of California, Berkeley, USA
- **Volker Briken**, University of Maryland, USA
- **Larry S. Schlesinger**, Texas Biomedical Research Institute, USA
- **Joel D. Ernst**, University of California, San Francisco, USA
- **Andrea M. Cooper**, University of Leicester, UK
- **Patrizia Amolio**, Centre Hospitalier Universitaire Vaudois, Switzerland

**Local Organizers**
- **Samuel M. Behar**, University of Massachusetts Medical School, USA
- **Valerie Mizrahi**, University of California, San Francisco, USA
- **Ann O’Garra**, University of California, San Francisco, USA
- **Thomas J. Scriba**, University of Cape Town, South Africa
- **Vojo Deretic**, University of New Mexico Health Sciences Center, USA
- **Larry S. Schlesinger**, Texas Biomedical Research Institute, USA
- **Matthew Knight**, University of California, Berkeley, USA
- **Joel D. Ernst**, University of California, San Francisco, USA
- **Andrea M. Cooper**, University of Leicester, UK

**Scientific Organizers**
- **Samuel M. Behar**
- **Valerie Mizrahi**
- **Ann O’Garra**
- **Vojo Deretic**
- **Matthew Knight**
- **Joel D. Ernst**
- **Andrea M. Cooper**

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**Website**: www.keystonesymposia.org/17A5

**Program Current As of October 10, 2019**

**Important Dates**
- **Abstract Deadline**: October 18, 2016
- **Discounted Abstract & Scholarship Deadline**: September 21, 2016
- **Global Health Travel Award Deadline**: August 16, 2016

**Venue**
- **Fairmont Hotel Vancouver, Vancouver, British Columbia, Canada**

**Contact**
- **Scientific and Program Information**: 800-257-1222, support@keystonesymposia.org
Shannon L. Russell, African Health Research Institute, South Africa
Short Talk: Metabolic Reprogramming during Chronic Mycobacterium Tuberculosis Infection Promotes Maladaptive T Cell Responses and Exhaustion

Stephen M. Carpenter, Regeneron Pharmaceuticals, USA
Dysfunction of Memory T Cells during Infection

Jacqueline M. Achkar, Albert Einstein College of Medicine, USA
Protective Roles of Antibodies in M. tuberculosis Infection

Julie G. Burel, La Jolla Institute, USA
Short Talk: Transcriptomic Profiling of Memory CD4 T Cells Reveals Novel Immune Signatures of Latent Tuberculosis

Patricia A. Darrah, NIAID, National Institutes of Health, USA
Short Talk: Aerosol or Intravenous BCG Immunization Induces Robust Tissue Resident T Cell Immunity in the Lungs of Nonhuman Primates

Bugs and Drugs: New Biological Insights Relating to Therapy
*Eric J. Rubin, Harvard T.H. Chan School of Public Health, USA
Veronique Anne Dartois, Hackensack Meridian Health, USA
The Impact of Lesion Diversity on Therapy
Valerie Mizrahi, University of Cape Town, South Africa
Metabolic Vulnerabilities in M. tuberculosis: Lessons from Guanine Nucleotide Metabolism
Dirk Schnappinger, Weill Cornell Medical College, USA
Genetic Analyses of Essential M. tuberculosis Genes

Meeting Wrap-Up: Outcomes and Future Directions (Organizers)
THURSDAY, JANUARY 19
Departure