The mammalian GI tract harbors a complex assemblage of microbial organisms that are essential for the development of the immune system. Alterations of the gut microbiota may lead to immune dysregulation both in the gut and in distal effector sites leading to the development of autoimmune disease. This meeting will focus on the role of the microbiota in balancing the effector and regulatory response leading to immune homeostasis. Recent findings suggest that altering certain bacterial populations present in the gut can lead to an inflammatory state associated with Th1/Th17 polarization. In contrast, other commensal bacteria and their antigenic products, when presented in the correct context, are regulatory and protect against inflammation. Particular emphasis will be placed on the biologic dynamics of the microbiota, the interaction with APC, modulation of the regulatory network and the immunologic consequences on experimental and human autoimmune conditions such as IBD, CNS demyelination and RA. The practical application of these novel interactions between the host and gut microbiota may lead to the identification of new therapeutics and novel insights into the mechanisms of human autoimmunity. The opportunity to assemble basic scientists in bacteriology and mucosal immunology with clinicians to explore this rapidly expanding arena is unique as there have been no previous organized meetings to meet this need. How the gut microbiome guides effector and regulatory immune functions will provide new pathways for the development of novel therapeutic targets.
SUNDAY, FEBRUARY 10
Arrival and Registration

MONDAY, FEBRUARY 11
Welcome and Keynote Address
*Lloyd H. Kasper*, Geisel School of Medicine at Dartmouth, USA
Dan R. Littman, HHMI/New York University School of Medicine, USA
The Gut Commensal Microbiota’s Effects on Systemic Autoimmunity

The Gut Microbiome
*Sarkis K. Mazmanian*, California Institute of Technology, USA
David A. Relman, Stanford University, USA
Assembly, Stability and Resilience of the Human Microbiome
Javier Ochoa-Repáraz, Eastern Washington University, USA
The Gut as a Source of Therapeutic Molecules Against Autoimmune Diseases
Gianfranco Grompone, BIOASTER, France
Short Talk: A Crypt Specific Core Microbiota Resides in the Mouse Colon
Elaine Y. Hsiao, University of California, Los Angeles, USA
Short Talk: A Commensal Bacterium of the Gut Microbiome Modulates Serum Metabolites and Ameliorates Behavioral Abnormalities in a Mouse Model of an Autism Risk Factor
Duane R. Wesemann, Harvard Medical School, USA
Short Talk: Development and Education of Early B Lineage Cells in the Gut Lamina Propria

Gut Microbiome and Immune Development
*Dennis L. Kasper*, Harvard Medical School, USA
Chyi-Song Hsieh, Washington University, USA
Education of the Immune System by Commensal Microbiota
Cathryn R. Nagler, University of Chicago, USA
Commensal Bacteria Induced Tregs and IgA Protect Against Allergic Responses to Food
Makoto Kinoshita, Osaka University, Japan
Short Talk: Dietary Folic Acid Promotes Survival of Foxp3+ Regulatory T Cells in the Colon
Katherine Nutsch, Washington University in St. Louis, USA
Short Talk: Commensal Microbiota-Specific TCRs Regulate Differentiation to a Regulatory Phenotype in an Inflammatory Environment
Koji Atarashi, Research Center for Allergy & Immunology, RIKEN, Japan
Short Talk: Human Clostridium Species Promote Intestinal Accumulation of Treg Cells

Poster Session 1

TUESDAY, FEBRUARY 12
Gut Microbiome-Innate Cell Interactions
*Dan R. Littman*, HHMI/New York University School of Medicine, USA
Nadine Cerf-Bensussan, Université Paris Descartes, France
Interactions of Segmented Filamentous Bacterium with the Host Immune System: Lessons from Gnotobiotic Mice

Sarkis K. Mazmanian, California Institute of Technology, USA
A Microbial System Promotes Stable Colonization by Bacteroides of the Gut Microbiota
Brian L. Kelsall, NIAID, National Institutes of Health, USA
Definition and Function of Mononuclear Phagocytes in the Colon
Gérard Eberl, Institut Pasteur, France
Development and Regulation of Intestinal Innate Lymphoid Cells
Amiran Dzutsev, NCI, National Institutes of Health, USA
Short Talk: CD103+ Migratory Dendritic Cells Scout the Colon Luminal Space, Take Up Bacteria and Transport them to Colonic Lymphoid Patches

Experimental Colitis/IBD: Regulatory Networks
*Brian L. Kelsall*, NIAID, National Institutes of Health, USA
Richard S. Blumberg, Brigham and Women’s Hospital, USA
CD1-NKT interactions in mucosal immunity
Dennis L. Kasper, Harvard Medical School, USA
Sphingolipids of Commensals Modulate Host Immunity through Regulation of iNKT Cells
David Artis, Cornell University, USA
Host-Microbial Interactions in Health and Disease
Dingding An, Harvard Medical School, USA
Short Talk: Symbiotic Bacterial Sphingolipids Modulate Host Adaptive Immune System and Host Resistance to Experimental Colitis Challenge
Suzanne Devkota, Cedars-Sinai Medical Center, USA
Short Talk: Omega-3 Supplementation Prevents Intestinal Inflammation by Inhibiting the Expansion of an Intestinal Pathobiont in IL10-/- Mice

Poster Session 2

WEDNESDAY, FEBRUARY 13
Gut Bacteria Modulation of Effector Networks
*Javier Ochoa-Repáraz*, Eastern Washington University, USA
Eric G. Pamer, University of Chicago, USA
Microbiota-Mediated Resistance to Infection by Intestinal Pathogens
Susan V. Lynch, University of California, San Francisco, USA
Gastrointestinal Microbiome and Pediatric Asthma Development
Gabriel Nuñez, University of Michigan, USA
Control of Pathogen Colonization and Eradication by Virulence Factors and the Gut Microbiota
Fiona M. Powrie, University of Oxford, UK
IL-23-Driven Cellular and Molecular Pathways that Promote Intestinal Inflammation and Colon Cancer
Nobuhiko Kamada, University of Michigan, USA
Short Talk: Controlling Virulence Factor Expression and Pathogen Eradication by Host Adaptive Immunity and the Gut Microbiota
Gregory F. Sonnenberg, Weill Cornell Medicine, USA
Short Talk: Innate Lymphoid Cell Regulation of Host-Microbiota Interactions and Intestinal Homeostasis

* Session Chair † Invited but not yet accepted Program current as of October 23, 2019. Program subject to change. Meal formats are based on meeting venue. For the most up-to-date details, visit www.keystonesymposia.org.
Gut Modulation of Effector/Regulatory Networks in CNS Disease

*Richard S. Blumberg*, Brigham and Women's Hospital, USA

**Gurumoorthy Krishnamoorthy**, Max Planck Institute of Neurobiology, Germany

Commensal Microbiota as a Trigger of Spontaneous Autoimmune Demyelination

**Yun Kyung Lee**, California Institute of Technology, USA

The Microbiota Impacts Vitamin D Status and Experimental Autoimmune Encephalomyelitis

**Lloyd H. Kasper**, Geisel School of Medicine at Dartmouth, USA

Role of Commensal Bacteria in the Regulation of Central Nervous System Disease Demyelination

**Sin-Hyeog Im**, POSTECH, South Korea

Short Talk: Immunomodulation of Neural Autoimmune Disorders with Probiotics

**Howard L. Weiner**, Brigham and Women's Hospital, Harvard Medical School, USA

Short Talk: Investigation of the Gut Microbiome in Multiple Sclerosis Patients

**Christophe Benoist**, Harvard Medical School, USA

Gut-Residing Segmented Filamentous Bacteria Drive Autoimmune Arthritis via T Helper 17 Cell

**Ivan Vujkovic-Cvijin**, NIAID, National Institutes of Health, USA

Short Talk: Dysregulation of the Colonic Mucosally-Adherent Microbiota Is Associated with Inflammatory Markers of HIV Disease Progression

**Mark Bazett**, Qu Biologics Inc., Canada

Short Talk: The Intestinal Microbiome and Intestinal Disease in a deltaF508 Cystic Fibrosis Mouse Model

**Sarkis K. Mazmanian**, California Institute of Technology, USA

Closing Remarks

FRIDAY, FEBRUARY 15

Departure

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Closing Remarks

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