



Join Keystone Symposia  
for the 2016 conference on:

# Gut Microbiota, Metabolic Disorders and Beyond

April 17–21, 2016

Hyatt Regency Newport | Newport, Rhode Island | USA

Scientific Organizers:

Rémy G. Burcelin, Sven Pettersson and Tak W. Mak

*The hologenome theory of evolution proposes that natural selection acts not on the individual organism but rather on the “holobiont,” which consists of the organism together with microbiome (its genes and metabolites). Effective study of the holobiont requires a systems biology approach: remove one component of the holobiont to study it in reductionist style and other parts also altered will be overlooked. Decades of reductionist research aimed at understanding the mechanisms responsible for the current dramatic epidemic of man-made metabolic diseases have not considered the holobiont perspective and have consequently missed the adaptation strategies of the microbiome and set the stage to explore the inchoate holobiont perspective. This meeting will discuss how the gut microbiome and its metabolites influence major molecular and physiological mechanisms responsible for man-made metabolic diseases.*

Session Topics:

- Gut Microbiota Biology, Microbiome and Evolution throughout Metabolic Diseases
- Tissue Communication
- Early Development – Maternal Life, Brain and Metabolic Development
- Therapeutic Strategies
- Small Intestine Liver Function, Bile Acids, Therapy
- Immunity and Metabolism
- Fat Muscle Function Therapeutic Aging Immunity
- Gut Immunity, Barrier Function and Effects on Metabolism
- Workshop: Microbiota-Related Biomarkers
- Workshop: Novel Mechanisms of Microbiota Regulated Metabolic Functions



Submitting an abstract is a great way of participating in the conference through poster presentation and possible selection for a short talk.

Scholarship & Discounted Abstract Deadline: Dec 17, 2015

Abstract Deadline: Jan 20, 2016

Discounted Registration Deadline: Feb 17, 2016

For additional details, visit [www.keystonesymposia.org/16D4](http://www.keystonesymposia.org/16D4).

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### SUNDAY, APRIL 17

#### Arrival and Registration

### MONDAY, APRIL 18

#### Welcome and Keynote Address

\***Sven Pettersson**, Karolinska Institutet, Sweden

**Jeremy K. Nicholson**, Imperial College London, UK  
*Towards Personalized Medicine and Microbiome Regulation*

#### Gut Microbiota Biology, Microbiome and Evolution throughout Metabolic Diseases

\***Rémy G. Burcelin**, Institute of Molecular Medicine, France

\***Matteo Serino**, INSERM, France

**Francois-Pierre Martin**, Nestlé Institute of Health Sciences, Switzerland  
*The Human GI Tract and its Microbiome: From Associations to Interactions*

**Stephan C. Schuster**, Nanyang Technological University, Singapore  
*Holobiont Concept and Tissue Compartment and Microbiome*

**Michael A. Fischbach**, Stanford University, USA  
*Small Molecules from the Human Microbiota*

**Filipe De Vadder**, University of Gothenburg, Sweden  
*Short Talk: The Gut Microbiota Induces Adult Neurogenesis in the Enteric Nervous System*

**Carmen A.K. Emborski**, Texas Tech University, USA  
*Short Talk: Evidence for Metabolic Inheritance via Microbial Transfer*

#### Workshop 1: Microbiota-Related Biomarkers

\***Jeremy K. Nicholson**, Imperial College London, UK

\***Sven Pettersson**, Karolinska Institutet, Sweden

**Shirong Liu**, Brigham and Women's Hospital/Harvard Medical School, USA  
*Fecal microRNAs Shape Gut Microbiota*

**Bailey Peck**, University of Michigan, USA  
*Gut Microbiota Responsive miR-375 Regulates Intestinal Epithelial Stem Cell Proliferation*

**Cheng-Yuan Kao**, National Health Research Institutes, Taiwan  
*A Multi-Omics Study Reveals Insights in Gut Microbiota and Mucosal Immunity in Obesity Resistance*

**Sangeeta Khare**, National Center for Toxicological Research-US-FDA, USA  
*Evaluation of the Silver Nanoparticles on Gut Virus/Phages and its Outcome on the Expression of Genes Involved in the Innate Antiviral Immune Response in Gut*

**Ara Koh**, Gothenburg University, Sweden  
*Microbiota-Mediated Intestinal Cell Fate Decision Occurs Primarily in Jejunum – Use of Intestinal Organoids*

**Kimberly A. Krautkramer**, University of Gothenburg, Sweden  
*Gut Microbiota Affect Host Epigenetic State*

#### Tissue Communication

\***Michael A. Fischbach**, Stanford University, USA

\***Francois-Pierre Martin**, Nestlé Institute of Health Sciences, Switzerland

**James Versalovic**, Texas Children's Hospital, USA  
*Gut Microbiome and Amino Acid Metabolism*

**Ruth E. Ley**, Max Planck Institute for Developmental Biology, Germany  
*Host Genetic Regulation of the Microbiome with Consequences for Phenotype*

**David A. Relman**, Stanford University, USA  
*Open Wide: Oral Microbiota in Health and Disease*

**Kairui Mao**, NIAID, National Institutes of Health, USA  
*Short Talk: Direct Visualization of Signaling Crosstalk Between the Microbiota and Immune System*

#### Poster Session 1

### TUESDAY, APRIL 19

#### Early Development – Maternal Life, Brain and Metabolic Development

\***Ruth E. Ley**, Max Planck Institute for Developmental Biology, Germany

\***Stephan C. Schuster**, Nanyang Technological University, Singapore  
**Kjersti Marie Aagaard**, Baylor College of Medicine, USA  
*Unexpected Beginnings: Role of Pregnancy and Parturition in Establishing our Microbiome*

**Bernard Thorens**, University of Lausanne, Switzerland  
*Glucose Signaling: Is There a Room for Microbiota?*

**Berengere Coupe**, Vaiomer, France  
*Tissue Microbiota-Derived Therapeutic Strategies in Metabolic Disease*

**Martin J. Blaser**, New York University School of Medicine, USA  
*Early Life Microbiota Development affects Long-Term Metabolic and Immunologic Consequences*

**Hans Rudolf Berthoud**, Pennington Biomedical Research Center, USA  
*Short Talk: Maternal Transplantation of High-Fat Diet/Obesity Shaped Gut Microbiota Affects Offspring Cognitive and Emotional Behavior in a Sex-Specific Manner*

**Taylor Kristina Soderborg**, University of Colorado Denver, USA  
*Short Talk: Maternal Obesity and Gestational Diabetes Alters 2 Week Human Infant Microbiome and Drives Metabolic Processes in Germ-Free Mice*

#### Poster Session 2

#### Workshop 2: Novel Mechanisms of Microbiota Regulated Metabolic Functions

\***Martin J. Blaser**, New York University School of Medicine, USA

\***Rémy G. Burcelin**, Institute of Molecular Medicine, France  
**Paola Tognini**, University of California, Irvine, USA  
*Intestinal Microbiota Influences Circadian Clock Function and Homeostasis in the Liver upon Food Stress*

**Suzanne Devkota**, Cedars-Sinai Medical Center, USA  
*Feast or Famine: Sustained Reshaping of the Gut Microbiota in Response to Fasting and Re-Feeding*

**Mukul Prasad**, National University of Singapore, Singapore  
*T-Cell Specific Signaling Molecule Themis in Development of Metabolic Disorder*

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**Shiho Fujisaka**, Joslin Diabetes Center and Harvard Medical School, USA

*Antibiotic Effects on Gut Microbiota, Insulin Signaling and Bile Acid Metabolism is Dependent on Host Genetic Background*

**Edina Hot**, European Institute of Oncology, Italy  
*Effects of Concurrent Administration of OCA and MCD Diet on NASH and Gut Vascular Barrier Permeability in Mice*

**Sean Davies**, Vanderbilt University, USA  
*Inhibiting Obesity with Engineered Therapeutic Bacteria*

**Hasinika Gamage**, Macquarie University, Australia  
*Fibre Products Derived from Sugarcane, Wheat Dextrin and Psyllium Husk Influence the Gut Microbiota in vitro*

**Diana E. Roopchand**, Rutgers University, USA  
*Gut Microbiota: A Missing Link for the Bioactivity of Dietary Polyphenols*

### Therapeutic Strategies

\***Filipe De Vadder**, University of Gothenburg, Sweden

\***Charles R. Mackay**, Monash University, Australia

**Max Nieuwdorp**, University of Amsterdam, Netherlands  
*Fecal Transplantation – Ongoing Trials Pros and Cons*

**Filipe J. Gomes Cabreiro**, University College London, UK  
*Host-Microbial Metabolic Complementation Modulates the Effects of Fluoropyrimidines in *C. elegans* Survival and Longevity*

**Elaine Holmes**, Imperial College London, UK  
*Bariatric Surgery and Microbial Metabolites*

**Hao Wu**, University of Gothenburg, Sweden  
*Short Talk: Insights into Metformin-Microbiota Interactions in Treatment of T2D: A Placebo-Controlled, Double-Blinded, and Treatment-Naïve Study*

**Emma D'Agostino**, University of North Carolina at Chapel Hill, USA  
*Short Talk: The Human GI Microbial GUSome, a Constellation of Drug Targets in the Microbiome*

### WEDNESDAY, APRIL 20

#### Small Intestine Liver Function, Bile Acids, Therapy

\***Max Nieuwdorp**, University of Amsterdam, Netherlands

\***Elaine Holmes**, Imperial College London, UK

**Lora V. Hooper**, University of Texas Southwestern Medical Center, USA  
*Circadian Regulation of Intestinal Host-Microbe Interactions*

**Lotta Stenman**, DuPont Nutrition and Health, Finland  
*Therapeutic Efficacy and Mechanisms of Probiotics and Prebiotics in Metabolic Disease*

**Fredrik Bäckhed**, University of Gothenburg, Sweden  
*Gut Microbial Regulation of Bile Acids and FXR Signaling in Metabolic Disease*

**Paolo Sassone-Corsi**, University of California, Irvine, USA  
*Molecular Mechanisms Linking the Gut Microbiota to the Circadian Clock*

**Kristien Bouter**<sup>†</sup>, University of Amsterdam, Academic Medical Center, Netherlands

*Short Talk: Oral Butyrate Treatment has Differential Effects on Insulin Sensitivity in Healthy Versus Metabolic Syndrome Subjects*

**Youngji (Helen) Cho**, Harvard University, USA  
*Short Talk: Bile Acid Metabolism, Gut Microbiota, and Pulmonary Responses to Ozone*

### Immunity and Metabolism

\***Filipe J. Gomes Cabreiro**, University College London, UK

**Gérard Eberl**, Institut Pasteur, France  
*The Regulation of Type 2 and Type 3 Immunity by Microbiota*

\***Tak W. Mak**, Campbell Family Institute for Breast Cancer, Canada  
*Low Grade Inflammation and Impact on Metabolic Circuits*

**Rémy G. Burcelin**, Institute of Molecular Medicine, France  
*Gut Microbiota-impaired Intestinal Immune Defense and Diabetes*

**Maayan Levy**, University of Pennsylvania, USA  
*Short Talk: Microbiota-Modulated Metabolites Shape the Intestinal Microenvironment by Regulating NLRP6 Inflammasome Signaling*

**Chrysothemis Brown**, Sloan Kettering Institute, USA  
*Short Talk: Retinoic Acid: A Metabolic Checkpoint during CD4+ T Cell Differentiation*

### Poster Session 3

#### THURSDAY, APRIL 21

#### Fat Muscle Function, Therapeutic Aging, Immunity

\***Lora V. Hooper**, University of Texas Southwestern Medical Center, USA

\***Paolo Sassone-Corsi**, University of California, Irvine, USA

**Diane Mathis**, Harvard Medical School, USA  
*Diabetes-Protective HLA/MHC Alleles Operate via the Microbiota*

**Jorge L. Ruas**, Karolinska Institutet, Sweden  
*Skeletal Muscle Kynurenine Metabolism in Metabolic and Psychiatric Diseases*

**Charles R. Mackay**, Monash University, Australia  
*Diet, Bacterial Metabolites and "Western Lifestyle" Inflammatory Diseases*

**José Manuel Fernández-Real**, Biomedical Research Institute of Girona - IDIBGI, Spain  
*Iron, Microbiota and NASH*

**Janelle S. Ayres**, The Salk Institute for Biological Studies, USA  
*Short Talk: Muscle Wasting Protection Mediated by Microbiome *E. coli* Involves Inflammasome and IGF-1 Signaling*

**John R. Kirby**, Medical College of Wisconsin, USA  
*Short Talk: Risperidone Treatment Alters Bacteria and Phage Populations in the Gut to Suppress Metabolic Rates Leading to Weight Gain*

#### Gut Immunity, Barrier Function and Effects on Metabolism

\***Diane Mathis**, Harvard Medical School, USA

\***Tak W. Mak**, Campbell Family Institute for Breast Cancer, Canada

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**Dan R. Littman**, HHMI/New York University School of Medicine, USA

*The Gut Microbiota to Immune System Molecular Crosstalk*

**Sven Pettersson**, Karolinska Institutet, Sweden

*Bidirectional Communication Pathways between the Gut Microbiome and its Host Influencing Host Physiology in an Age-Dependent Manner*

### Closing Keynote Address

\***Dan R. Littman**, HHMI/New York University School of Medicine, USA

**Lewis C. Cantley**, Weill Cornell Medicine, USA

*Gut Microbiota Biology, Microbiome and Evolution throughout Metabolic Diseases*

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

**FRIDAY, APRIL 22**

**Departure**