The interactions between the mother and the fetus during the progression of normal pregnancy involve trade-offs, or even conflicts, between factors that improve maternal health and those that support fetal development and growth. These may lead to selective evolutionary pressures that differ among species, and result in intriguing differences in reproductive strategies that enhance maternal-fetal biological harmony, and mitigate conflict. Intriguing strategies to balance these pressures include imprinting, coincident with placentation. Adverse pregnancy outcomes, such as miscarriage, preterm birth, preeclampsia and intrauterine growth restriction, are heterogeneous, and gaps remain in understanding how imbalances between maternal and fetal adaptations contribute to these disorders. The goal of this conference is to bring together investigators from diverse disciplines who investigate maternal and fetal factors that shape pregnancy outcomes by exploring how these systems work together or are at odds. The conference will aim to develop these concepts, illuminating developmental, genomic/epigenomic, immune, microbial and metabolic factors, as well as consider how acute exposures during pregnancy, such as infection, shape maternal-fetal outcomes. Understanding the biology underpinning these considerations will contribute to better diagnosis, treatment and disease prevention during pregnancy. The presentations will address critical gaps in our knowledge of maternal/fetal harmony and conflict, and target paths to improve understanding of issues related to social, economic and geographic inequality that predispose some groups to enhanced risk during pregnancy. A better understanding of the biology, and development of new collaborative possibilities and paths to improved clinical outcomes are primary goals of the conference.

Session Topics:
• The Placenta – Cells to Tissues
• The Rapidly Evolving Placenta
• The Establishment of Pregnancy – Tolerance and Rejection
• Crosstalk between the Maternal and Fetal Microbial Communities
• Epigenetics and Imprinting in Feto-Placental Harmony and Conflict
• Genomic Communication during Pregnancy
• From Uterine Quiescence to Parturition
• Epidemiology of Pregnancy Health and Outcomes

Global Health Travel Award Application Deadline: May 9, 2017
Scholarship Application & Discounted Abstract Deadline: June 6, 2017
Abstract Deadline: July 11, 2017
Discounted Registration Deadline: August 10, 2017

Note: Scholarships are available for graduate students and postdoctoral fellows and are awarded based on the abstract submitted. Submitting an abstract is an excellent opportunity to gain exposure for your work. Abstracts submitted by the abstract deadline will also be considered for short talks on the program.

www.keystonesymposia.org/17T2
**Workshop 1: Immunology of Maternal-Fetal Harmony vs. Conflict**

*Jeffrey C. Murray*, Bill & Melinda Gates Foundation, USA  
David Haig, Harvard University, USA  
*Maternal-Fetal Crosstalk: Why all the Noise?*

**The Placenta – Cells to Tissues**

*Yoel Sadovsky*, Magee-Womens Research Institute, USA  
Guillaume Cornelis, Stanford University, USA  
*When the Placenta Goes Viral: Role of Transposons during Placentation*

Margherita Yayoi Turco, University of Cambridge, UK  
*Modelling the Maternal-Fetal Interface in vitro*

Susan J. Fisher, University of California, San Francisco, USA  
*Genome-Scale Fluctuations in the Cytotrophoblast Epigenome over Gestation and in Placental Pathologies*

Matthew Brook, University of Edinburgh, UK  
*Short Talk: PABP4 Is Critical for Mammalian Pregnancy: A Unique Mouse Model for the Maternal Origins of IUGR and Stillbirth*

**Workshop 1: Immunology of Maternal-Fetal Harmony vs. Conflict**

*Susan J. Fisher*, University of California, San Francisco, USA  
Rabia Anwar, Max Delbruck Centre, Germany  
*Trophoblast-Specific Gene Expression Driven by Endogenous Retrovirus LTRs in Normal vs. Pre-Eclamptic (PE) Pregnancy*

Marilen Benner, Radboud University Medical Center, Netherlands  
*Human Uterine Lymphocytes Acquire a More Experienced and Tolerogenic Phenotype during Pregnancy*

Ana Claudia Zenclussen, Experimental Obstetrics and Gynaecology, Germany  
*Safeguarding of Fetal Growth by Uterine Mast Cells and Uterine Natural Killer Cells*

Thomas Vauvert Hvid, Zealand University Hospital and University of Copenhagen, Denmark  
*Immune Markers in the Mid-Luteal Endometrium Are Associated with Normal Fertility and Pregnancy after in vitro Fertilization*

Michela Frascoli, University of California, San Francisco, USA  
*Alloreactive Fetal T Cells Promote Uterine Contractility in Preterm Labor via IFN-γ and TNF-α*

Wentong Jia, Institute of Zoology, Chinese Academy of Sciences, China  
*Association of Maternal KIR and Fetal HLA-C Genotypes with the Risk of Preeclampsia in Chinese Han Pregnant Population*

Jeremy Michael Kinder, Cincinnati Children's Hospital, USA  
*Mother's 'Genetic' Little Helpers: Microchimeric Maternal Cells Promote Reproductive Fitness and Survival of Non-Inherited Traits*

**The Rapidly Evolving Placenta**

*Louis J. Muglia*, Cincinnati Children's Hospital Medical Center, USA  
Derek Wildman, University of Illinois at Urbana-Champaign, USA  
*The Placenta Is at the Crossroads of Maternal-Fetal Conflict and Cooperation*

Bernard J. Crespi, Simon Fraser University, Canada  
*Placental Invasiveness and Maternal-Fetal Conflicts in Evolution, Health and Disease*

R. Michael Roberts, University of Missouri, USA  
*Studying Early-Onset Preeclampsia (EOPE) in a Model for Early-Stage Human Placental Trophoblast*

Xu Wang, Auburn University, USA  
*Short Talk: The Origin and Evolution of Genomic imprinting in the Placenta from Comparative Genomic Analysis Across Marsupials and Eutherian Mammals*

**Poster Session 1**

**The Establishment of Pregnancy – Tolerance and Rejection**

*Carole R. Mendelson*, University of Texas Southwestern Medical Center, USA  
Sing Sing Way, Cincinnati Children's Hospital, USA  
*Maternal-Fetal Immunology during Pregnancy and after Parturition*

Sarah A. Robertson, University of Adelaide, Australia  
*The Immune Response and Female Reproductive Quality Control*

Joanna Halkias, University of California, San Francisco, USA  
*Short Talk: CD161 Promotes Prenatal Immune Suppression of Pro-Inflammatory PLZF+ T Cells*

Moriya Gamliel, Hebrew University, Israel  
*Human Natural Killer Cells Remember Pregnancy and Enhance Placental Bed Development*

Ashley Moffett, University of Cambridge, UK  
*Maternal Allo-Recognition of the Fetus: For Better, For Worse?*

Gabriela Dveksler, Uniformed Services University of the Health Sciences, USA  
*Short Talk: Pregnancy-Specific Glycoproteins Play a Role in Several Processes Required for Successful Human Pregnancy*

**Crosstalk between the Maternal and Fetal Microbial Communities**

*Laura I. Romero*, University of Miami, USA  
Daniel DiGiulio, Stanford University, USA  
*The Vaginal Microbiome Signature of At-Risk Pregnancy*

Idit Kosti, Cincinnati Children's Hospital Medical Center, USA  
*Short Talk: Meta-Analysis of Vaginal Microbiome Data Provides New Insights on Preterm Births*
From Uterine Quiescence to Parturition

*Yoel Sadovsky, Magee-Womens Research Institute, USA

Understanding the Terminal Events in Pregnancy

SAMANTHA R. MURRAY, Magee-Womens Research Institute, USA
Progesterone Signaling in Human Parturition: Role of Progesterone Receptor Modifications

SUNDAY, OCTOBER 8

From Uterine Quiescence to Parturition

*Yoel Sadovsky, Magee-Womens Research Institute, USA

Understanding the Terminal Events in Pregnancy

KEYSTONE SYMPOSIA
on Molecular and Cellular Biology
Maternal-Fetal Crosstalk: Harmony vs. Conflict (T2)
October 4-8, 2017 • Westin Washington, DC City Center • Washington, DC, USA
Scientific Organizers: Jeffrey C. Murray, Louis J. Muglia and Yoel Sadovsky
Part of the Keystone Symposia Global Health Series, supported by the Bill & Melinda Gates Foundation


Lenore P. Pereira, University of California, San Francisco, USA
Persistent Cytomegalovirus and Zika Virus Infection in Human Placentas Modulated by Host Antiviral Responses

Carolyn B. Coyne, University of Pittsburgh, USA
Antimicrobial Signaling at the Maternal-Fetal Interface

Poster Session 2

SATURDAY, OCTOBER 7

Epigenetics and Imprinting in Feto-Placental Harmony and Conflict

*Bernard J. Crespi, Simon Fraser University, Canada
Communication between Mother and Fetus Mediated by Imprinted Genes

Marika Charalambous, Queen Mary University of London, UK
The Effects of Assisted Reproductive Technologies on Placental Development and Epigenetic Regulation in a Mouse Model

Jon F. Wilkins, Ronin Institute, USA
Crosstalk Six Months after Delivery

Marisa S. Bartolomei, University of Pennsylvania Perelman School of Medicine, USA
The Effects of Assisted Reproductive Technologies on Placental Development and Epigenetic Regulation in a Mouse Model

Madhumita Basu, Nationwide Children's Hospital, USA
Short Talk: Epigenetic Mechanism for Gene-Environment Interaction in Maternal Hyperglycemia-Mediated Congenital Heart Defects

Richard Saffery, University of Melbourne, Australia
Epigenetic Regulation of Human Placental Function and Pregnancy Outcome

Jyotdeep Kaur, PGIMER, India
Short Talk: Epigenetic Mechanisms Regulate Placental Tumor Suppressor- and Onco-Genes in Normal and Pathological Pregnancies: Search for Novel Fetal DNA Epigenetic Marker

Genomic Communication during Pregnancy

*Louis J. Muglia, Cincinnati Children's Hospital Medical Center, USA
Genomic Communication during Pregnancy

Thuy Ngo, Oregon Health and Science University, USA
Cell-Free Circulating RNA as a Window to Feto-Placental Biology

Yoel Sadovsky, Magee-Womens Research Institute, USA
The Biology of Placental Exosomes and their miRNA Cargo

Nathan D. Price, Institute for Systems Biology, USA
Systems Biology Analysis of Pregnancy Conditions

Terry K. Morgan, Oregon Health & Sciences University, USA
Short Talk: High-Resolution Flow Cytometry Reveals Placental-Specific Exosomes in Postpartum Blood: Maternal-Placental Crosstalk Six Months after Delivery

Epidemiology of Pregnancy Health and Outcomes

*Jeffrey C. Murray, Bill & Melinda Gates Foundation, USA
Epidemiology of Pregnancy Health and Outcomes

Louis J. Muglia, Cincinnati Children's Hospital Medical Center, USA
Populations as Laboratories for Biological and Social Discovery in Pregnancy Outcomes

Jane Norman, University of Edinburgh, UK
Pregnancy Stressors and Influences on Parturition

Rachel Fraith, University of Exeter, UK
Genetic and Environmental Determinants of Birth Weight and Links with Later Life Disease

Meeting Wrap-Up: Outcomes and Future Directions

*Jeffrey C. Murray, Bill & Melinda Gates Foundation, USA
Meeting Wrap-Up: Outcomes and Future Directions

Louis J. Muglia, Cincinnati Children's Hospital Medical Center, USA
Part of the Keystone Symposia Global Health Series, supported by the Bill & Melinda Gates Foundation

For the most up-to-date details, visit www.keystonesymposia.org.