



# Maternal-Fetal Crosstalk: Harmony vs. Conflict

October 4–8, 2017 | Westin Washington, DC City Center | Washington, DC | USA

## Scientific Organizers:

**Jeff Murray**, Bill & Melinda Gates Foundation

**Louis J. Muglia**, Cincinnati Children's Hospital Medical Center, USA

**Yoel Sadovsky**, Magee-Womens Research Institute, USA

*Part of the Keystone Symposia Global Health Series, supported by the Bill & Melinda Gates Foundation*

*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.

Meeting Hashtag: #KSserotonin

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# KEYSTONE SYMPOSIA

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### WEDNESDAY, OCTOBER 4

#### Arrival and Registration

Looking Ahead – Partnering for the World We Want (Joint Session with Grand Challenges and Keystone Symposia)

#### Registration Continues

### THURSDAY, OCTOBER 5

#### Welcome and Keynote Address

\***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 Delbrück 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 Hviid**, 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- $\gamma$  and TNF- $\alpha$*

**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*

**Eun Lee**, Virginia Commonwealth University, USA

*ERAP2 Modulates Trophoblast Cell Death by Natural Killer Cells*

#### 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

### FRIDAY, OCTOBER 6

#### 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**, University of California, San Francisco, USA

*Short Talk: Meta-Analysis of Vaginal Microbiome Data Provides New Insights on Preterm Births*

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**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

**Marika Charalambous**, Queen Mary University of London, UK  
*Communication between Mother and Fetus Mediated by Imprinted Genes*

**Jon F. Wilkins**, Ronin Institute, USA  
*Canalization, Phenotype Variation and Imprinting in Complex Disease*

**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

**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*

### Poster Session 3

#### SUNDAY, OCTOBER 8

##### From Uterine Quiescence to Parturition

\***Yoel Sadovsky**, Magee-Womens Research Institute, USA

**Roger Smith**, University of Newcastle, Australia  
*Understanding the Terminal Events in Pregnancy*

**Sam A. Mesiano**, Case Western Reserve University, USA  
*Progesterone Signaling in Human Parturition: Role of Progesterone Receptor Modifications*

**Laura Sillers**, Children's Hospital of Philadelphia, USA  
*Short Talk: Altered Acylcarnitine Metabolism in the Placenta in Spontaneous Preterm Birth*

**Carole R. Mendelson**, University of Texas Southwestern Medical Center, USA  
*Fetal Signals that Control the Timing of Parturition*

**Caitlin Dunn-Fletcher**, Cincinnati Children's Hospital Medical Center, USA  
*Short Talk: Deletion of Retroviral Element THE1B Abolishes Placental Corticotropin-Releasing Hormone Expression and Restores Normal Birth Timing*

**Roberto Romero**, National Institutes of Health / Wayne State University, USA  
*Infection, Inflammation and the Transition to Labor*

##### Panel: How to Harness Basic and Translational Biology Research to Improve Pregnancy Outcome in Low- and Middle-Income Countries

\***Jeffrey C. Murray**, Bill & Melinda Gates Foundation, USA

\***Yoel Sadovsky**, Magee-Womens Research Institute, USA

\***Louis J. Muglia**, Cincinnati Children's Hospital Medical Center, USA

**Joe Leigh Simpson**, March of Dimes, USA

**Jane Norman**, University of Edinburgh, UK

**Sarah A. Robertson**, University of Adelaide, Australia

**Janna Patterson**, Bill & Melinda Gates Foundation, USA

##### Epidemiology of Pregnancy Health and Outcomes

\***Jeffrey C. Murray**, Bill & Melinda Gates Foundation, USA

**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 Freathy**, 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

\***Louis J. Muglia**, Cincinnati Children's Hospital Medical Center, USA

\***Yoel Sadovsky**, Magee-Womens Research Institute, USA

#### MONDAY, OCTOBER 9

##### Departure