



gapps

an initiative of Seattle Children's

GLOBAL ALLIANCE TO PREVENT
PREMATURITY AND STILLBIRTH

Preventing Preterm Birth Initiative

The Preventing Preterm Birth initiative (PPB) was developed to advance understanding of the mechanisms leading to preterm birth to effectively identify women at risk and novel targets for prevention throughout the world.

What is the PPB initiative?

Preterm birth is the leading cause of death for all children under age 5 worldwide and a leading cause of severe childhood disability. Despite this high global burden, few strategies exist for early detection of women at risk and effective prevention.

The Preventing Preterm Birth initiative is a \$20 million program that accelerates research by funding projects focused on discovering and developing interventions to prevent preterm birth, with a focus on prevention strategies applicable in low-resource, high-burden settings. Researchers conducting prospective studies of pregnant women in low-income countries are connected with a consortium of innovative researchers investigating causes of preterm birth and novel biomarkers and methods for prevention.

Funded by the Bill & Melinda Gates Foundation and administered by the Global Alliance to Prevent Prematurity and Stillbirth (GAPPS), the PPB is the first of the Family Health series of Grand Challenges in Global Health.

International Research Sites

The PPB funds two international research sites for the investigation of preterm birth and stillbirth in low- and middle-income countries.

The research sites enroll women early in pregnancy and collect information and biological specimens during their pregnancy and delivery. Particular attention is given to accurate determination of gestational age and complications of pregnancy. Data and specimens are used to advance innovative research into the causes of preterm birth and identify novel strategies for prevention.

The PPB biorepository has been developed to accelerate research in pregnancy health through broad access to data and specimens and use of standardized, harmonized methods to ensure quality, based on the model developed by the GAPPS Repository.

A Systems Biology Approach

The PPB is funding additional projects that discover and characterize the complex array of biological processes that occur with normal and abnormal pregnancies. The goal is to develop biomarkers to identify at-risk pregnancies through rigorous analysis of underlying biological mechanisms that lead to preterm birth, focusing on the role of high dimensional systems biology and its applications in pregnancy. Results from the awards will be combined to investigate, in a comprehensive fashion, the multiple, complex factors regulating normal pregnancy and preterm birth.

Global Coalition to Advance Preterm birth Research (GCAPR)

A key mission of the PPB is to increase awareness of the global burden of preterm birth and the urgent need for more research to identify new solutions. The Global Coalition to Advance Preterm birth Research (GCAPR) was formed to identify and advance priority research through expanded networks, communications and collaborations among organizations to fund the research needed to reduce preterm birth across the spectrum of discovery, development and delivery science. Learn more at www.gcapr.org.

[more ->](#)



Finding New Solutions

Summaries of projects funded by the PPB:

- Drs. Kristina Adams Waldorf and David Eschenbach at the University of Washington conducted pilot studies of the vaginal microbiome and immunologic factors of the female reproductive tract to investigate protective strategies for ascending bacterial infection and risk of preterm birth.
- Dr. David Aronoff of Vanderbilt University Medical Center, with an interdisciplinary team of experts in microbiology, immunology, reproductive biology and vaccine development, are examining how infections of the female reproductive tract interact with and evade the immune system, resulting in infections of the uterus that cause preterm birth and stillbirth.
- Dr. Margaret Hostetter from Cincinnati Children's Hospital Medical Center and her co-investigators are investigating how disruption of *Candida* colonization and other micro-organisms of the lower female genital tract result in dysregulation of the host response and risk of preterm birth.
- Dr. Kevin Kain of the University Health Network and the University of Toronto is investigating malaria infections of the placenta to reveal specific roles of the immune response that lead to preterm birth, low birth weight and stillbirth.
- Stephen Lye, of the Samuel Lunenfeld Research Institute at Mount Sinai Hospital in Toronto, and his team are conducting a pilot study that uses a systems biology analysis of genomic, proteomic and plasma markers to identify novel pathways and biomarkers to preterm birth.



Learn More

For more details on the Preventing Preterm Birth initiative, please visit www.gapps.org/healthybirth

- Dr. Sam Mesiano from Case Western Reserve University School of Medicine and his team are investigating the body's receptors for progesterone to identify novel therapeutic targets for the prevention of preterm birth.
- Dr. David Olson from the University of Alberta is investigating multiple mediators of infection and inflammation in the uterus early in pregnancy and testing new diagnostics and therapeutics that can identify women at risk, modulate the inflammatory response and prolong pregnancy.

International Research Sites

- Dr. Anisur Rahman, of the Matlab Health Research Centre at the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), leads a prospective cohort study of pregnant women, building on the icddr,b community-based surveillance site, to enroll more than 4,000 pregnant women over 3 years.
- Dr. Jeffrey Stringer, an obstetrician and director of the University of North Carolina Global Women's Health group, oversees a team of Zambian and U.S. researchers in a prospective cohort study of 2,000 pregnant women over a 3 year period in Lusaka, Zambia.

Systems Biology Projects

- Drs. Gregory Buck and Jennifer Fettweis of Virginia Commonwealth University are researching changes in the microbiome throughout pregnancy to determine how they contribute to preterm birth and help them identify predictive biomarkers that will allow development of early interventions.
- Dr. Elaine Holmes at Imperial College London is researching the microbiome and metabolome of pregnant women who deliver either at term or preterm, and evaluating connections between biological processes of pregnancy by analyzing data to predict women at risk for preterm birth.
- Dr. Robert C. Murphy at University of Colorado Denver is using mass spectrometry to investigate lipid and hormone biochemistry of pregnant women to identify biomarkers and determine pregnant women at risk for preterm birth.