The Role We’re Playing to End Premature Birth

The History
For more than 75 years, the March of Dimes has been a powerful force for improving the health of infants, children and their families. The March of Dimes was founded in 1938 by Franklin Delano Roosevelt to lead the fight to eradicate poliomyelitis. At the time, polio was a mysterious childhood crippler that paralyzed tens of thousands, including FDR himself. In response, the March of Dimes mobilized an effort that was unheard of in the history of medical philanthropy.

After funding a nearly 20-year effort to develop an effective vaccine and building a grassroots volunteer force second to none, the March of Dimes provided for the vaccination of hundreds of millions of children and adults. In doing so, the March of Dimes fulfilled its original charter: the practical elimination of polio in the United States and more recently, very nearly the rest of the world. This now legendary accomplishment proved to be just the first of many that would improve maternal and child health worldwide.

The Facts
Premature birth is one of the most intractable health challenges in modern medicine.

• One in ten babies in the United States is born prematurely each year
• Premature birth is the leading cause of newborn death from birth to age five
• Nearly half a million babies are affected annually
• Premature birth costs society more than $26 billion a year

• The consequences of premature birth often lead to a lifetime of significant health challenges
• A late-premature baby's risk of dying is about three times that of a full-term infant
• 15 million children are born prematurely every year worldwide

The Partnership

• A network of Prematurity Research Centers fostering a new model of collaboration with the goal of ending premature birth
• The five March of Dimes Prematurity Research centers are: Stanford University, the Ohio Collaborative, Washington University in St. Louis, the University of Pennsylvania, and the University of Chicago-Northwestern-Duke
• The University of Pennsylvania has teamed with some of the leading medical and teaching institutions to create the March of Dimes Prematurity Research Center at the University of Pennsylvania
• A March of Dimes scientific review committee evaluates research progress annually and shapes its direction

The Research

• We are pioneering a transdisciplinary approach—the most diverse mobilization of scientific expertise ever brought to bear on the elimination of prematurity.

• Goals of the Prematurity Research Center in Pennsylvania:
  – Discover the causes of premature birth
  – Develop new ways to identify at risk women or pregnancies
  – Rapidly turn breakthroughs into effective clinical and policy-based solutions

• Research themes the University of Pennsylvania is pursuing:
  – Bioenergetics and Genetics
  – Cervical Remodeling
  – Placental Dysfunction

The Campaign

The paradigm of a single researcher in a lab working alone belongs to another era and another set of problems. Solving prematurity will require extraordinary effort and an extraordinary commitment to bring together the very best of what we know and have learned. Nothing less will do.

The main research focus of the March of Dimes and its five Prematurity Research Centers is ending prematurity. That's why we've committed to raising $75 million dollars to develop and accelerate breakthrough developments that will save lives and countless families the heartbreak of having a baby that is born too soon. So help us give every baby a fighting chance. Please join us in our campaign to end premature birth.

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The Evidence

The more than 200 researchers working in a transdisciplinary model represent multiple specialities from the medical, scientific, bio-engineering and academic communities. The sheer number of publications, speaking engagements and abstracts that have been presented to the medical community at large reflects not only the magnitude of the challenge prematurity presents, but also the international attention it's receiving. The papers detailing the collaboration inside and across the Prematurity Research Centers are presented below as evidence of this extraordinary effort.

Publications:

2016


Presented Abstracts:

2016

2. Cervicovaginal inflammation induces miRNAs in cervical tissue: a potential mechanism for premature cervical remodeling and preterm birth. Luz-Jeannette Sierra, PhD, Amy G. Brown, PhD, Lauren Anton, PhD, Guillermo Barilá, BS, and Michal A. Elovitz MD. Society for Reproductive Investigation (SRI); March 16th-20th 2016; Montreal, CA-QC
3. Lactobacillus strains alter cervical epithelial barrier function through inflammatory and miRNA-dependent pathways Lauren Anton PhD, Ann DeVine, BS, Amy G. Brown, PhD, Luz-Jeannette Sierra, PhD, Michal A. Elovitz MD. Society for Reproductive Investigation (SRI); March 16th-20th 2016
4. Metabolomics in placenta of a mouse model of preterm birth. Summer Elshenawy, MD, Amy G Brown, PhD, Guillermo Barila, BS, Michael S Hester, PhD, Michal A Elovitz, MD and Rebecca A Simmons, MD. Society for Reproductive Investigation (SRI); March 16th-20th 2016
5. miR-143 and miR-145 inhibit cell proliferation: a potential mechanism for cervical epithelial barrier breakdown and premature cervical remodeling. Lauren Anton PhD, Ann DeVine, BS, Amy Brown, PhD, Michal A. Elovitz MD. Society for Reproductive Investigation (SRI); March 16th-20th 2016
The Evidence (cont)


2017

14. Jeny Gharvey1, Katheryne Downes1, Laura Anglim1, Julie Romero1, Amy Brown1, Michal A. Elovitz1. The cervicovaginal metabolome is different in symptomatic women who deliver preterm compared to term; 2017 SMFM.

15. Mirella Mourad, Sisi Qin, Cande Ananth, Emilie Vander Haar, Yiping Han, Mara Guichon Rubinstein, Kyoko Yoshida, Kristin Myers, Jan Kitajewski, Carrie Shawber, Ronald Wapner, Michael Sheetz, Joy Vink. Human Cervical Smooth Muscle Stretch Increases Pro-Inflammatory Cytokine Secretion. 2017 SMFM.


17. Luz-Jeannette Sierra, Amy G. Brown, Guillermo O. Barilá, Lauren Anton, and Michal A. Elovitz. Colonization of the cervicovaginal space with Gardnerella vaginalis leads to inflammation and cervical remodeling in vivo. 2017 SRI.

18. Lauren Anton, PhD, Ann DeVine, BS, Amy G. Brown, PhD, Luz-Jeannette Sierra, PhD, Michal A. Elovitz MD. Common vaginal bacterial strains regulate cervical epithelial barrier function through inflammation-mediated mechanisms. 2017 SRI.


