

# Microorganisms in the womb set stage for diseases

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Researchers review importance of microorganisms that exist in the gut, suggesting perturbation of the environment during pregnancy, delivery and early infancy could impact the developing baby's early microbiome and set the stage for health problems later in life. The term "microbiome" refers to the trillions of organisms we harbor, on our skin and within our respiratory and gastrointestinal tracts.

"The Microbiome and Childhood Diseases," a special issue of the *Birth Defects Research Part C EmbryoToday* scientific journal released today, is a collection of ground breaking microbiota reviews. One particularly noteworthy finding pertains to the womb environment in which the baby develops.

"One of the reviews, by Koleva et al., discusses the studies that reveal that the womb is not sterile and that the microbiota of the child are already developing in utero," explained Sharon Meropol, MD, PhD, Associate Director for Research and Evaluation at University Hospitals Rainbow Babies & Children's Hospital's Center for Child Health and Policy. "This means that not only do we have to consider the microbiome of the child but also that of the mother, and the irony is that some of our modern medical practices, through their effect on these early microbiota, could have unintended consequences, interfering with normal development of children's immune, metabolic, and neurologic systems."

The special issue is particularly timely as Birth Defects Prevention

Month prepares to kick off in January. According to Dr. Meropol, increasing evidence supports the importance of protecting key steps in the transfer and maintenance of the normal microbiota in pregnant mothers and fetuses.

"Disturbed microbiota could potentially contribute to a wide range of [childhood diseases](#) including allergies, asthma, obesity, and autism-like neurodevelopmental conditions," said Dr. Meropol, who is also Assistant Professor of Pediatrics at Case Western Reserve University School of Medicine. "But recent studies suggest that traditional practices like vaginal births, skin-to-skin contact immediately after birth and breastfeeding may promote the development of the microbiome in the infant and help set the trajectory towards healthy development."

UH Rainbow's visionary physician researchers John Kennell, MD, and Lydia Furman, MD, were early proponents of vaginal delivery, and kangaroo care (skin to skin contact) and breastfeeding immediately following birth, advising more than a decade ago that these practices are associated with psychosocial, metabolic and immunologic benefits for full-term and premature infants. [Furman L, Kennell, J. *Acta Paediatr.* 2000;89:1280] Since then, compelling evidence has continued to mount that these practices are beneficial for intergenerational transfer of the microbiome from mother to infant.

Dr. Meropol and Amy Edwards, MD, pediatric infectious disease specialist at UH Rainbow, provide an overview of the potential influences of the developing infant microbiome from the clinical perspective in the special issue of *Birth Defects Research Part C EmbryoToday*.

"We have just scratched the surface in understanding how the internal universe of maternal, fetal and infant colonizing microbiota, interacting with genetic and environmental factors, can influence optimal child

development," says Dr. Meropol. "We are grateful to The Teratology Society for recognizing the importance of this research and shedding light on the evolving story of the microbiome."

**More information:** Sharon B. Meropol et al. Introduction, *Birth Defects Research Part C: Embryo Today: Reviews* (2015). [DOI: 10.1002/bdrc.21119](https://doi.org/10.1002/bdrc.21119)

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