DOHaD22-ABS-1830 NEONATAL TRANSFER OF MATERNAL MICROBIOTA HAS A LASTING EFFECT ON THE FEEDING BEHAVIOR OF THE OFFSPRING

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Abstract Content: Introduction: The microbiome is known to impact nearly every aspect of host physiology in health and disease, as it has a substantial effect on metabolic function. Vertical transmission from mother to child can affect the physiology from one generation to the next when changes in the composition of the microbiota have occurred due to maternal diet or obesity.

Objectives: Our objective was to study whether obesity or thinness during gestation and lactation would impact different maternal microbiota and whether the transfer of microbiota to the newborn would modify feeding behavior, independently of the metabolic alterations of the mother. We thus characterized the potential role of vertical transfers of maternal microbiota in the programming of offspring feeding behavior and studied the potential mechanisms underlying the programming.

Methods: Selectively obesity-prone (OP)/obesity-resistant (OR) Sprague Dawley dams were used because differences in cultures of cecal microbiota and milk microbiota were demonstrated. Microbiota collected from the vagina, feces and milk were orally inoculated into conventional Fischer F344 recipient puppies from birth to 15 days to create 3 groups of puppies: F-OP, F-OR and F-Sham.

Results: Early transfer of maternal microbiota was associated with specific feeding behavior traits that predisposed F-OP rats to a higher risk of overconsumption in later periods of life. The metagenomic analysis allowed us to identify a few species and the corresponding metagenomic functions positively or negatively associated with the alteration of food intake parameters and the cerebral functional pathway. DGE seq analysis of brain structure, neuroanatomy features, and NMR analysis of plasma and intestinal contents of transferred animals were also studied to search for a potential mechanistic relationship between microbiome activity and brain development.

Conclusion: These results support the idea that neonatal transfer of gut microbiota can program feeding behavior, probably by acting on early phases of neurodevelopment.