

PRESENTATION ABSTRACTS



KEYNOTE:

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Dr. Azad is an Associate Professor of Pediatrics and Child Health at the University of Manitoba, where she holds a Tier 2 Canada Research Chair in Developmental Origins of Chronic Disease. Her research program is focused on the role of infant nutrition and the microbiome in child growth, development and resilience. Dr. Azad co-Directs the new Manitoba Interdisciplinary Lactation Centre (MILC) and leads the new International Milk Composition (IMiC) Consortium. She serves as Deputy Director of the CHILD Cohort Study, a national pregnancy cohort following 3500 children to understand how early life experiences shape lifelong health. Research in the THRiVE Discovery Lab is funded by the Canadian Institutes of Health Research, the Canada Foundation for Innovation, and the Bill and Melinda Gates Foundation. Dr. Azad serves on the International Society for Research in Human Milk and Lactation Executive Council and the joint US/Canada Human Milk Composition Initiative. She is a Fellow of the CIFAR Humans and the Microbiome Program and an elected member of the Royal Society of Canada College of New Scholars. Dr. Azad received the International Society for Research in Human Milk and Lactation Erlich-Koldovsky Early Career Investigator Award (2018) and the International Human Milk Genomics Mid-Career Investigator Award (2020). She was named among the WxN Canada Top 100 Most Powerful

7 years of human milk oligosaccharide research in the CHILD Cohort: What have we learned and what's up next?

The CHILD Cohort Study (www.childstudy.ca) is following 3500 Canadian families from pregnancy onwards to understand the developmental origins of chronic diseases. We have shown that breastfeeding is associated with reduced risks of childhood asthma and obesity in the CHILD cohort, and these beneficial effects appear to be partly mediated by the infant gut microbiome. Current research in Dr. Azad's THRiVE Discovery Lab (www.thrivediscovery.ca) is focused on understanding how breast milk components, including human milk oligosaccharides (HMOs), shape the developing infant microbiome and contribute to health and disease trajectories.

Since 2015, in collaboration with the Bode Lab at UC San Diego, we have analyzed the HMO profiles of 1600 CHILD mothers to describe and understand the inter-individual variation in HMO composition and investigate associations with infant health. Genetic fucosyltransferase-2 (FUT2) secretor status was the strongest determinant of HMO composition, followed by lactation stage (many, though not all, HMOs are present at lower concentrations later in lactation). Seasonal and geographic variation was observed for several HMOs. Additionally, certain HMOs were associated with maternal parity, ethnicity, and breastfeeding exclusivity. In terms of infant outcomes, we found that HMO profiles were associated with infant gut microbiota composition and risk of food sensitization, suggesting their potential therapeutic utility.

Ongoing HMO research in the CHILD cohort includes: a genome-wide association study to identify novel genes associated with HMO synthesis and secretion, integrated analysis of HMO and infant gut and nasal microbiome data to understand how HMOs shape these microbial communities, and translational research to build upon observations from CHILD to explore mechanisms in rodents or ex vivo models. Additionally, a subset of CHILD families are included in Dr. Azad's International Milk Composition Consortium which aims to compare milk composition across diverse global settings, and understand their role in infant and child growth and development.