



Trainee Expansion Program

AWARDEES SPRING 2019



We are pleased to present the awardees of the TEP Travel Funds, who each received up to USD 10,000 to advance their academic career.

ALEXANDRA GEORGE



Human Milk Lipidomics and Infant
Outcomes

TTF Awardee 2019

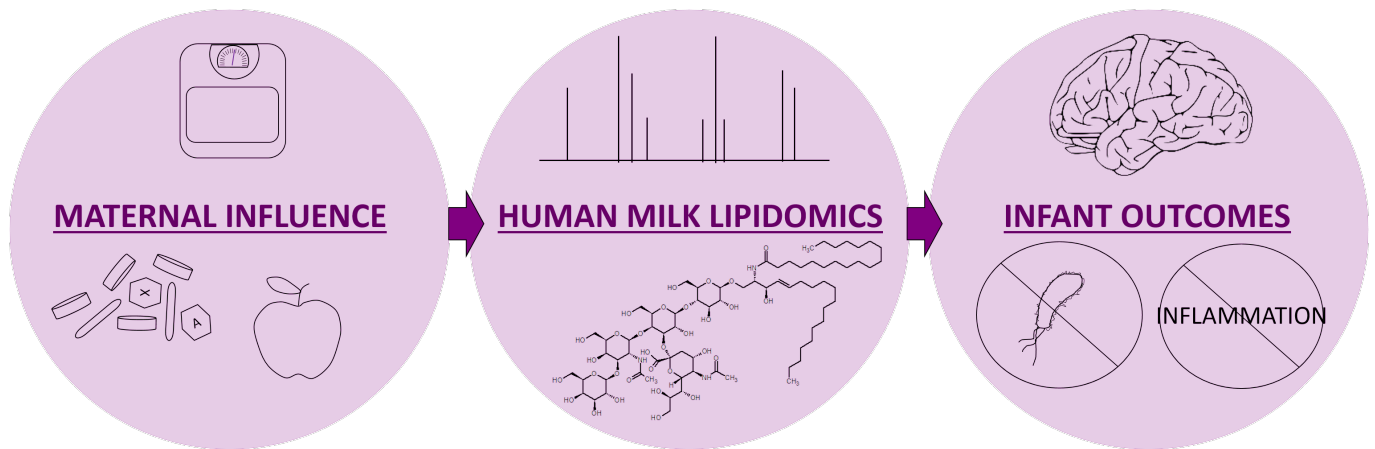
ANURADHA RAVI



Impact of HMOs and milk
microbiota on the infant gut
microbiome

TTF Awardee 2019

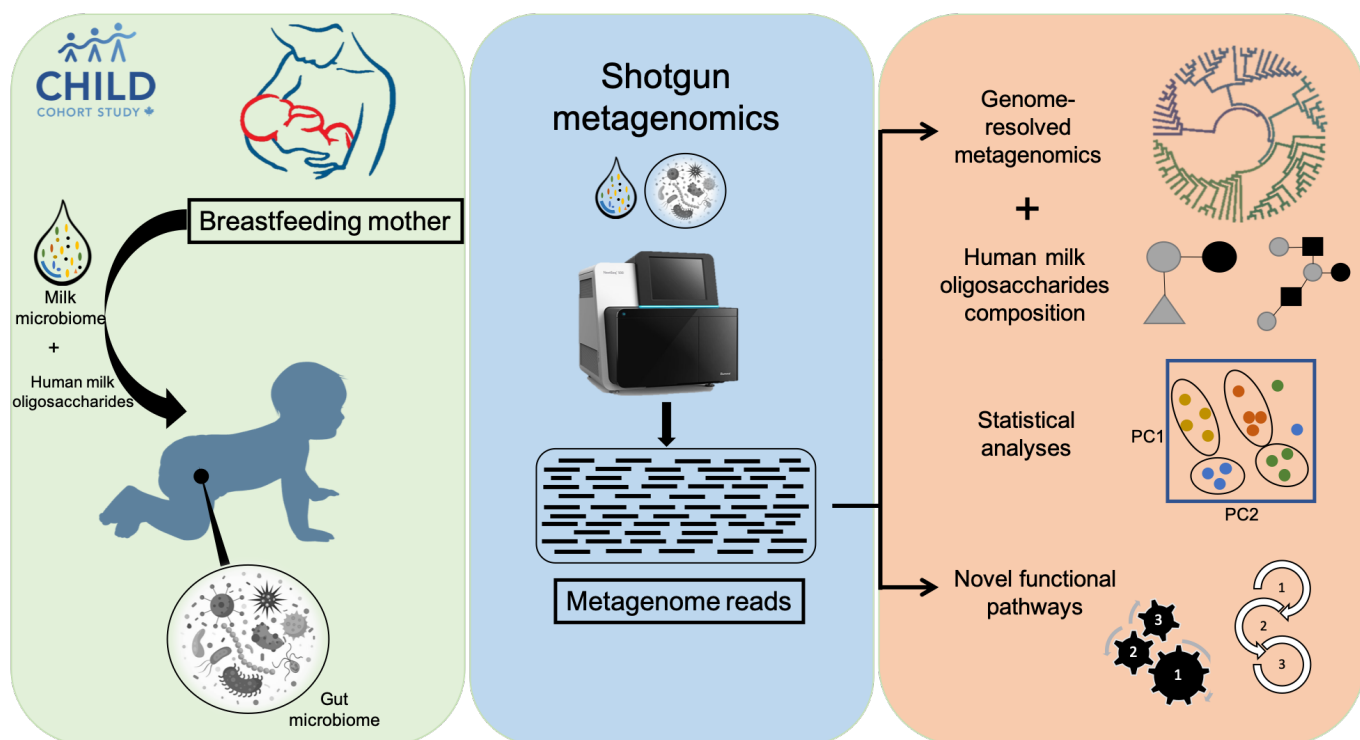
ALEXANDRA GEORGE



Human milk lipids comprise approximately 5% of all human milk macronutrients and deliver over 50% of the infant's daily energy intake. It is understood that approximately 98% of these lipids are triacylglycerides and that fatty acids are involved in infant neural development. Despite this, we know surprisingly little about the complex human milk lipidome and the specific influence lipids have on infant outcomes. The majority of human milk lipid research focuses on fatty acids, which contribute to structures such as triglycerides, sphingomyelins, gangliosides and phospholipids; yet the variation of all lipids, both inter- and intra-individual, is not fully understood – likely from a lack in comprehensive methodology. In her PhD research, Alexandra has recruited a longitudinal cohort of mothers and infants, collecting hundreds of milk samples and substantial complementary data, to interrogate the human milk lipid profile. With support from the ISRHML FLRF TTF, she will work to develop and optimise lipidomics methodologies to analyse the milk lipids which have been least characterised, such as gangliosides, which are proposed to be involved in infant brain development, anti-inflammatory and anti-infection processes. The methodologies will be used to investigate the influence these lipids have on infant growth, health and development.

Alexandra George is a third year PhD candidate in the School of Molecular Sciences, at The University of Western Australia. Alexandra has a strong interest in metabolomics and what 'omics technologies such as mass spectrometry can tell us. This interest led Alexandra to her PhD research that she is carrying out in Australia, under the supervision of Dr. Donna Geddes. Alexandra's PhD research focuses on the complex human milk lipidome: developing and optimising lipidomics methodology, and identifying and characterising the lipids of human milk. With the advancement of mass spectrometry and chromatographic techniques, the potential to fully characterise human milk is improving exponentially, and, excitingly, comprehensive human milk lipidomics is becoming more practical and possible.

ANURADHA RAVI



Breastfeeding profoundly influences the developing microbiota and has subsequent benefits to infant health. Human milk oligosaccharides (HMO) and microbiota are two major milk components that influence the infant microbiota. With pre- and pro-biotic properties, they can modulate the environment of the infant gut by creating a permissive environment for sustainable colonization and transmitting new bacterial species. Currently, there is lack of knowledge in understanding the effect of HMOs on the microbes in the milk and their combined modulation of the infant gut. Working with investigators from the CHILD Study at the University of Manitoba and the University of Calgary International Microbiome Centre, Anu will analyze shotgun metagenome data to study the impact of HMOs and milk microbiota on the structure and function of the infant gut microbiome.

Dr. **Anuradha (Anu) Ravi** is a postdoctoral research scientist at Quadram Institute Biosciences in Norwich, United Kingdom. She completed her PhD in 2017 from Norwegian University of Life Sciences, Norway. Her dissertation research was on using 16S rRNA and shotgun metagenome sequencing to study the prevalence and persistence of antibiotic resistance genes in mother and child cohorts from Norway and Spain. Anu's research interests is focused on improving our current knowledge on the effects of breastmilk microbiome in the development of infant microbiota and preventing allergies. She is interested in using high throughput sequencing technologies and cutting-edge bioinformatics tools for achieving this. Anu believes that the TEP award will be an important step towards this goal and a great opportunity to widen her skillset. She will be mentored by Dr. Meghan Azad who is a distinguished mentor and co-leads the Manitoba site of the CHILD study.