

The Metaproteomic Analysis of HIV Uninfected Exposed Infants' Gut Microbiome to Help Understand Their Poor Health Statuses in An African Cohort

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Abstract : Millions of babies are still born to HIV-infected mothers each year despite the ramped-up HAART use. However, these infants are HIV uninfected but exposed, which is now a growing population that has weakened immune systems and poorer outcomes. Due to HIV exposure and possible ARV exposure during pregnancy and breastfeeding, these infants are believed to have altered immune responses and microbiomes when compared to their healthy counterparts. The gut microbiome roles an important role in infant development, specifically in the immune system. Research has shown these HIV-exposed, uninfected infants have weaker immune responses to their neonate vaccines, and in developing countries, this leaves them vulnerable to opportunistic disease. By gaining a deeper understanding of the gut microbiome and the products of the microbes via metaproteomic analysis, we can hopefully understand and improve the immune system and health of these infants. To investigate the metaproteome of the infants' guts, mass spectrometry will be used, followed by data analysis using DIA-NN. The hypothesized results are that the HIV-exposed, uninfected infants have an altered microbiome compared to their healthy counterparts. Additionally, the differences found are hypothesized to be involved with inflammation which would contribute to the poor health of the infants.

Keywords : HIV, mass spectrometry, metaproteomics, microbiome

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