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**BREASTFEEDING: MANIFESTING THE SYNERGY  
OF ISLAM & SCIENCE**

## ROLES OF HUMAN MILK MIRNAS AND MICROBIOTA IN INFANT'S GUT: A SYSTEMATIC REVIEW

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Early-life breastfeeding practice provides multiple advantages to infant subsequently contributing to significant short- as well as long-term positive health outcomes. The current notion suggested that in the first 1000 days of life, infant's body is susceptible to external factors and highly inducible towards complex repertoire of components originated from mother's milk. This condition permits diverse components of human breast milk ranging from microRNA and microbiome to larger size macronutrient to act by supplementing and supporting their under-developed body system in early life. Currently, the discoveries of milk miRNA as key effectors in multiple biological processes in different infant's organs including gastrointestinal tract are growing rapidly. In addition, the perception on the translocation of bacteria from mother's intestine to breast milk has given rise to the idea that these bacteria may as well dynamically transferred to the infant and provide protection to poor barrier integrity of their gut. Hence, the aim of this paper is to conduct a systematic review in order to collect, compile, and extract data related to human milk miRNAs and microbiota as well as their functions in infant's gut following the relevant guidelines of Preferred Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P). A systematic search will be done on at least three databases such as Scopus, PubMed and Medline using relevant Medical Subject Headings (MESH) terms including human milk AND miRNA AND (microbiota OR microbiome) AND (infant OR child OR children) AND (gut OR intestine OR intestinal) from 2011 through 2021. From the databases, papers obtained will be sorted accordingly based on the objective, and inclusion and exclusion criteria and subject to Crowe Critical Appraisal Tool (CCAT) to further assess and ensure the quality, validity and eligibility of the research papers before reviewing thoroughly. This study is expected to provide a comprehensive presentation and information on the types of miRNAs and microbial species as well as their roles, functions and importance in boosting the system within infant's gut. In depth, the miRNAs that capable of inducing genetic expression of their target genes or regulate particular important signalling pathways that would be beneficial in enhancing the immune system within infant's gut may be presented in this study. Similarly, for some beneficial microbial species in the gut such as *Lactobacilli* with unique mechanisms and mode of actions in preventing the colonization of pathogenic bacterial within infant's gastrointestinal tract and reduce clinical infection.

**Keywords:** *Milk, Mirnas, Microbiota, Infant, Gut.*