

# Gut Microbiota and the Development of the Brain

## Resume

- a. The human gut hosts more than 1000 bacteria, exceeding the number of cells in the body [1].
- b. Microbiota constitutes the bacteria living inside and on the human body. Most of them are friendly in nature. They predominate the somatic and germ cells of the body by approximately a factor of 10 [1].
- c. The commensal microflora is specific to the human gut. It enters into a symbiotic association with the human host starting with the colonization of the gastrointestinal tract by bacteria within half an hour after delivery and continues to develop depending on many factors. This developmental process starts at birth, continues through early developmental stages, and lasts for life [1].
- d. This process occurs during vulnerable developmental periods; thus, it might influence the structure and function of organs (such as brain) which could persist throughout life [1].
- e. Although the colonization of microbiota is affected by postnatal environmental and genetic factors, yet it is consistent and difficult to change after reaching adulthood [1].
- f. It has a pre- and post natal effect on the developing infant brain [2].
- g. The microbiota is necessary to the proper development of the systemic and mucosal immune systems. It is also essential for nutrient uptake and metabolism. These contribute to the individual's physiology and affect the function of the central nervous system as well as behavior [1].
- h. The effect of microbiota on the functional development of the infant (mammalian) brain is of particular interest [1].
- i. The developing brain is susceptible to internal and external cues during its perinatal life. This is important when considering the association between some neurodevelopmental disorders (such as autism or schizophrenia) and microbial pathogen infections occurring during this period [2,3].
- j. Breast feeding and probiotics are now being recognized in the brain-gut axis interaction [2].

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**Sirin Mneimneh and Aziz Koleilat\****Paediatric department, Makassed University General hospital, Lebanon*

\*Corresponding author: Aziz Koleilat, Paediatric department, gastroenterology, asthma, Makassed University General hospital, Beirut Lebanon, Email: drkoleilat@hotmail.com; pediatric@makassedhospital.org

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