

Abstract

This work summarizes relevant information about bacterial ecosystem of human intestine with an emphasis on microbiome-host communication. I describe physiological mechanisms influencing so as distant as the intestine and the brain. Neuropsychiatric and neurodevelopmental disorders, especially autism, are used as a model.

Human gut microbiome influences function and development of the brain in many ways. The intestinal barrier permeability increases and decreases by the consequences of microbes contact with epithelium. Many bacterial species produce neuroactive molecules, neurotransmitters, their precursors and fatty acids. These molecules enter the bloodstream depending on intestinal barrier tightness. Disruption of microecosystem and host communication may cause pathological inflammations and increase cytokine production. Cytokines are able to weaken the blood-brain barrier and enable penetration of potentially harmful substances into the brain.

The main goal of this bachelor thesis is to summarize and logically organise current information and point out important questions about the relations between the microbiome composition and mental health. In conclusion, bacterial microbiome influences brain functions in health and disease. Ecological destabilisation of microbiome is one of the factors worsening or even directly causing neuropsychiatric illness.