

# Gut microbiome and human health

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The effects of gut microbiota on human health have been proven. The human “gut microbiome” is considered an organ of approximately 2 kg consisted of tens of trillions of microorganisms, including about 1000 different known species.<sup>1</sup> According to the studies, these microorganisms carry about 3 million genes which are about 150 times more than the human genes; therefore, human gut is a fount of genetic diversity.<sup>2</sup> The gut microbiota is considered an integral part of the immune system, which affects and modulates the metabolism of the body and interactions of drugs. Accordingly, it has inevitable effects on human health.<sup>3</sup> Intestinal bacteria form in the early hours after birth and various factors such as type of delivery (vaginal birth, cesarean section), the life style, social factors, economic factors, diet, use of antibiotics, diseases and many other factors influence the composition and type of gut microbiome.<sup>4</sup> It has been documented that the human digestive tract bears a vast population of bacteria including commensal and opportunistic pathogenic bacteria. The opportunistic pathogenic bacteria of gut microbiota is a threat to immunocompromised people. Moreover, some non-pathogenic bacteria hurt their host via producing some metabolites such as trimethylamine-N-oxide, trimethylamine, and indole.<sup>3</sup> Although not all of the roles of intestinal bacteria are known, there is strong evidence that the disturbance of human microbiota is

associated with a wide variety of diseases and disorders including asthma, allergies, diabetes, hepatic steatosis, obesity, depression, cancer, autoimmune diseases, and even nervous system disorders, as well as Alzheimer's disease and Autism. As a result, unraveling the symbiotic interactions between the gut microbiota and host and the related metabolites as biomarkers may lead to the development of new therapeutic strategies.

#### Conflict of Interest Disclosures

None.

#### Ethical Approval

Not applicable.

#### References

1. Thursby E, Juge N. Introduction to the human gut microbiota. *Biochem J.* 2017;474(11):1823-1836. doi: 10.1042/BCJ20160510.
2. Ho JT, Chan GC, Li JC. Systemic effects of gut microbiota and its relationship with disease and modulation. *BMC Immunol.* 2015;16:21. doi: 10.1186/s12865-015-0083-2.
3. Kumar A, Chordia N. Role of microbes in human health. *Appl Microbiol Open Access.* 2017;3(2):131. doi: 10.4172/2471-9315.1000131.
4. Faith JJ, Guruge JL, Charbonneau M, et al. The long-term stability of the human gut microbiota. *Science.* 2013;341(6141):1237439. doi: 10.1126/science.1237439.