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Optimizing the Functionality of the Gut Microbiome

Introduction

Gut microbiota plays a very important role in maintaining health. Gut dysbiosis is associated with many chronic diseases. The therapy of chronic diseases mostly does not take into account the role of gut microbiota in the etiology and pathogenesis of chronic diseases, which reduces its effectiveness. Current knowledge points to the fact that the modulation of gut microbiota can be an effective tool for their prevention and supportive therapy.

Methods

Despite the fact that the diversity, composition and functionality of the gut microbiota are closely interconnected, the key factor for maintaining health and increasing the effectiveness of disease prevention and therapy is the optimal functionality of the gut microbiome. For the above reasons, effective modulation of the gut microbiome should be aimed primarily at optimizing its functionality. An appropriate combination of personalized and targeted modulation of the gut microbiota based on the analysis of the gut microbiome, metabolome and clinical data of a patient can be an effective way of optimizing the functionality of the gut microbiome (Bomba a Haranta, 2023). Based on the analysis of the gut microbiome, metabolome and clinical data of a patient, a suitable consortium of probiotic microorganisms, components potentiating their effect and metabolites is compiled with the aim of correcting gut dysbiosis, reducing the negative effects of gut dysbiosis on the host and also optimizing the functionality of gut microbiota and positively influencing the mechanisms of the pathogenesis of the patient's disease.

Results

The study confirmed the significance of a personalized approach in probiotic supplementation (Ryšávka P., Haranta M., Bomba et al., 2022). After 3 months of personalized probiotic supplementation, a statistically significant increase in abundance of genera *Lactobacillus* and *Bifidobacterium* and phylum *Actinobacteria* was observed. The overall number of species was also increased. Probiotic supplementation improved stool frequency in both diarrhea and constipation.

Discussion

A suitable combination of personalized and targeted modulation of the gut microbiome has the potential to optimize the functionality of the gut microbiota, minimize the negative effects of gut dysbiosis on the organism and positively influence the mechanisms involved in the pathogenesis of the patient's disease. Further research will bring new knowledge allowing to simplify and optimize the analyzes for obtaining the data necessary for the compilation of effective interventions to optimize the functionality of the gut microbiome by combining its personalized and targeted modulation. It can be expected that the optimizing the functionality of gut microbiome will become part of the effective prevention and supportive therapy of chronic diseases.

References

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