

Modulation of the gut-brain axis using psychobiotics in neurodegenerative diseases

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Abstract

One of microbiome research's most challenging and divisive issues is the link between gut microbial metabolism and mental health. Understanding the therapeutic impact of gut bacteria on mental health is of utmost importance for increasing the well-being state of the world's population. Psychobiotics are a type of probiotic that influence central nervous system processes and human behaviors via neural, immune, and metabolic pathways regulated by the gut-brain axis. They increase not only gastrointestinal function but also antidepressant and anxiolytic ability. Moreover, psychobiotics can effectively treat neurodegenerative and neurodevelopmental diseases, such as depression, anxiety, autism, Attention-Deficit Hyperactivity Disorder, Alzheimer's disease, Parkinson's disease, schizophrenia, Huntington's disease, anorexia nervosa, and multiple sclerosis. Even though the mechanism of interaction between psychobiotics and these diseases is not fully elucidated.

On this basis, we focus on understanding the relationship between gut microbiota and its impact on neurological and neurodegenerative illnesses. In addition, we aim to highlight the potential activity of probiotics as a therapeutic approach for the prevention and/or treatment of the abovementioned diseases. Our study reviews recent research on the gut-brain axis and the possible beneficial effects of psychobiotics in neurological disorders. To develop and significantly improve future studies, we have evaluated the scientific literature and presented the accumulated data on this topic. Therefore, the therapeutic use of psychobiotics opens potential future directions for investigation.

Keywords: Dysbiosis, Gut-brain axis, Gut microbiota, Psychobiotics, Psychiatric disorders.