

Special Issue

Gut–Brain Axis: Pathophysiological Mechanisms in Neurological Disorders and Metabolic Diseases

Message from the Guest Editor

Bidirectional communication between the gut and the brain can be influenced by a wide variety of environmental and dietary stimuli, altering the gut microbiota and influencing the immune system. The gut microbiota plays a role in the development of brain regions and is thought to influence human behavior and brain function. Studies have indicated a causal link between altered gut microbiota and the onset and progression of neurodegenerative/neuroinflammatory diseases, psychiatric disorders, and neurological disorders. The gut–brain axis can have significant effects on anxiety, stress, depression, pain, cognitive function, and memory. On the other hand, stress can lead to changes in the microbiota and consequently mood via the hypothalamic–pituitary–adrenal axis. Dysregulation in the gut–brain communication can occur through a complex bidirectional communication system. A series of events that include changes in intestinal permeability, production of microbial metabolites, and activation of the enteric nervous system, immune system, microglia, and astrocytes can lead to mood and behavioral disturbances, and metabolic and neurological alterations.

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