



## Neuromicrobiology Services Section Home

### History

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### Gut-Brain Axis Hypothesis

The late 20th century marked the conceptual emergence of the gut-brain axis hypothesis, suggesting bidirectional communication between the gut microbiota and the brain.

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### Noteworthy Personnel

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### John F. Cryan

Renowned for his contributions to the field of psychobiotics, John Cryan's work explores the interplay between the gut microbiota and mental health, offering insights into potential therapeutic avenues for mood disorders.

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### Evolution Till Date

Neuro microbiology has evolved through key phases:

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### Gut-Brain Axis Unveiling

The conceptualization of the gut-brain axis, revealing the communication between gut microbes and the brain through neural, immune, and hormonal pathways.

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## **Industrial Applications**

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### **Microbiota-Based Therapies**

Exploring the development of probiotics and prebiotics to modulate the gut microbiota and potentially alleviate neurological symptoms.

3.

### **Neurodegenerative Disease Research**

Investigating the role of the gut-brain axis in neurodegenerative diseases like Alzheimer s and Parkinson s to uncover potential therapeutic targets.

5.

### **Microbiome-Gut-Brain Communication Studies**

Investigating mechanisms through which gut microbes influence the brain, including immune signaling and microbial metabolites.

7.

### **Microbiome-Immune Interactions**

Understanding how gut microbes influence immune responses that impact neurological health.

9.

### **Neuroinflammation Studies**

Investigating how microbiota influence inflammation in the brain and its effects on neurological disorders.

11.

### **Microbial Influence on Neurotransmitters**

Studying how gut microbes affect the production and regulation of neurotransmitters.

13.

### **Enteric Nervous System Interactions**

Investigating interactions between the gut s enteric nervous system and the central nervous

system.

15.

### **Microbiome-Brain Aging**

Studying how changes in the gut microbiome may contribute to cognitive decline and brain aging.

17.

### **Microbiota and Blood-Brain Barrier**

Exploring how the gut microbiome may influence the permeability of the blood-brain barrier.

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### **Microbiome and Neuropharmacology**

Exploring how gut microbes may influence the effectiveness of neuropharmacological treatments.

### **Personalized Microbiome Interventions**

Developing tailored interventions that leverage individual microbiome profiles to treat neurological disorders.

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### **Precision Psychobiotics**

Designing psychobiotics customized for specific mental health conditions.

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### **Neuroinflammation Management**

Designing strategies to modulate microbiota-driven inflammation in neurological diseases.

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### **Gut-Brain Modulation Techniques**

Developing non-invasive techniques to modulate the gut-brain axis, such as through diet, probiotics, and neuromodulation.

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## **Neurogenesis and Microbiota**

Exploring how the microbiome influences neurogenesis and brain plasticity.

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