

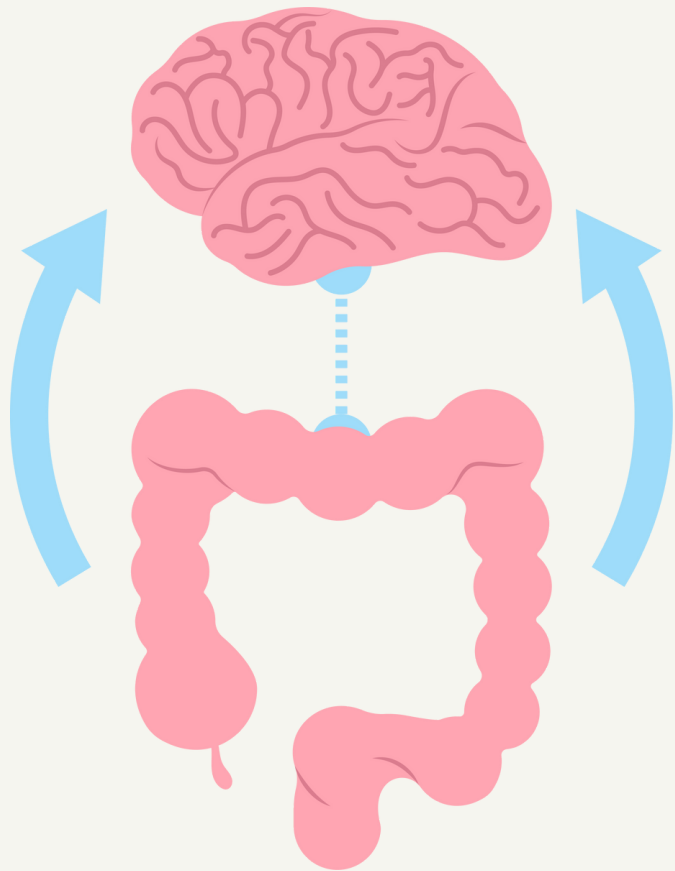
# GUT HEALTH SERIES



3

GUT - BRAIN  
CONNECTION

# The gut-brain connection



Also known as the **gut-brain axis**, refers to the bidirectional communication system that exists between the **gastrointestinal tract (GIT)** and the **central nervous system (CNS)**, which includes the brain and spinal cord.

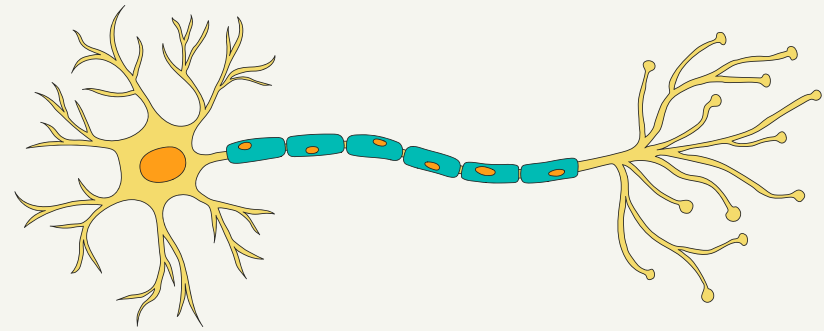
This intricate and complex communication network involves **neural, hormonal, and immunological pathways** and plays a significant role in influencing various aspects of physical and mental health.

# Gut-brain Axis and human health



- ➔ MENTAL HEALTH
- ➔ STRESS RESPONSE
- ➔ NEUROLOGICAL DISORDERS
- ➔ COGNITION AND MEMORY
- ➔ INFLAMMATION AND IMMUNE SYSTEM

# 1. Vagus nerve



One of the most important and longest nerves in the human body. It's a major **pathway** for exchanging information between brain and gut.

Signals travel from **gut - vagus nerve - brainstem**, where they can influence various brain regions, including those involved in regulating emotions, mood, and behaviour.

In the Gut it influences:

- **Digestive contractions**
- **Rate of absorption of nutrients**
- **Hormonal pathways (including stress hormones)**
- **Immune system**
- **Inflammation**

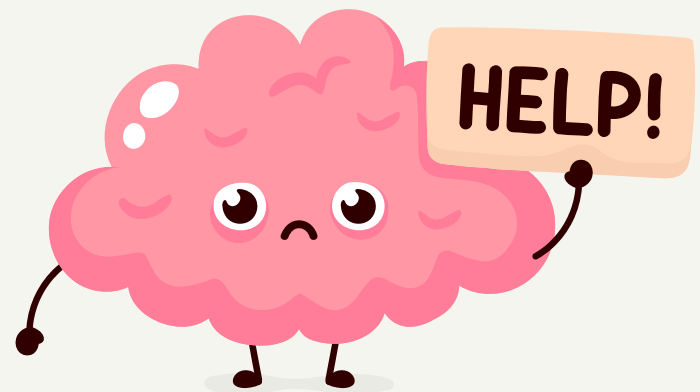
## 2. Production of Neurotransmitters

The gut produces various **neurotransmitters** and **hormones**, many of which are identical or similar to those found in the brain. Over 30 neurotransmitters are produced in the gut, including:

**90-95%** of all serotonin and **50%** of all dopamine are produced in the gut

**Ghrelin** and **leptin**, which regulate hunger and satiety, can also influence brain function and behaviour

Bad functioning of the gut impacts mental health and can result in conditions such as **anxiety** or **depression**.

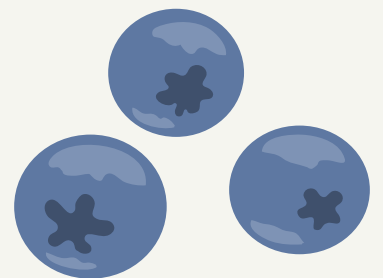


### 3. Microbiota

The community of microorganisms is collectively known as **microbiota**. Microbes can communicate with the brain through various mechanisms, including the production of certain **neurotransmitters, metabolites** and **short-chain fatty acids (SCFAs)**.

#### Short-Chain Fatty Acids (SCFAs):

Microbes ferment **dietary fibers** in the gut to produce SCFAs: acetate, propionate, and butyrate. SCFAs can pass through the gut lining and **enter the bloodstream**, where they can reach the brain and influence neural function.



# Improving mental health

By taking care of the gut microbiome through a **balanced and healthy lifestyle**, we can enhance the communication between our gut and brain, leading to improved well-being and vitality.

- **Balanced and diverse gut microbiota**
- **Diet rich in fibre and nutrients**
- **Minimizing antibiotics and other medications**
- **Reducing stress levels**
- **Regular physical activity**
- **Adequate sleep**
- **Hydration**
- **Pro and prebiotics**

