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New perspectives on microbiome-dependent gut-brain pathways for the treatment of depression with gastrointestinal symptoms: from bench to bedside

Key words: Depression; Gastrointestinal disorders; Gut-brain axis; Pathomechanism; Treatment

Research Summary

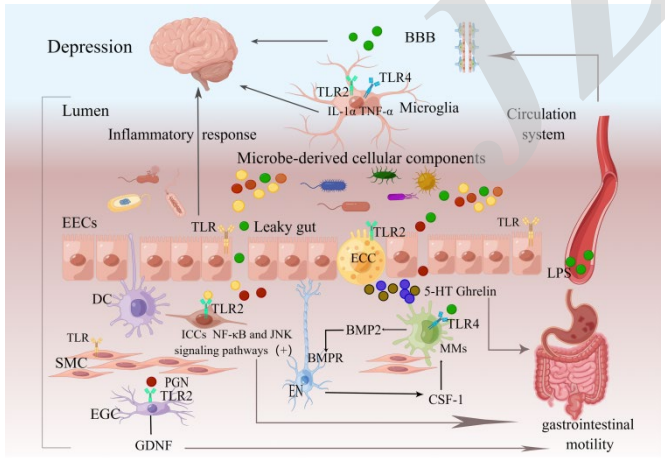
In this review, we combine preclinical and clinical evidence to summarize the role of the microbial-regulated GBA in emotions and GI function, and summarize potential therapeutic strategies to provide a reference for the study of the pathomechanism and treatment of depression in combination with gastrointestinal symptoms.

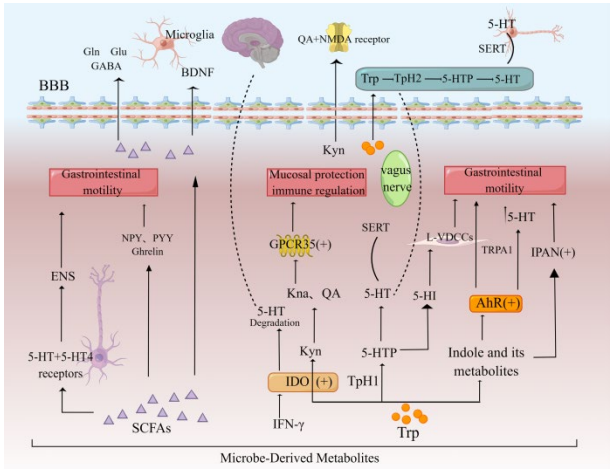
key pathogenesis

Microbiome-dependent abnormalities in the gut-brain pathway

- **Microbial derivatives**

Microbe-derived cellular components





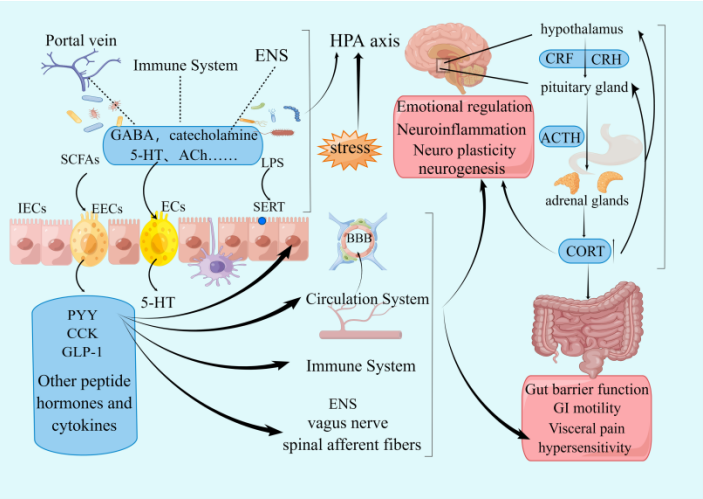
Microbe-derived metabolites

SCFAs

Trp metabolites

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Research Summary



- **Endocrine pathway**

  Microbial endocrine

  Gastrointestinal endocrine system

  HPA axis

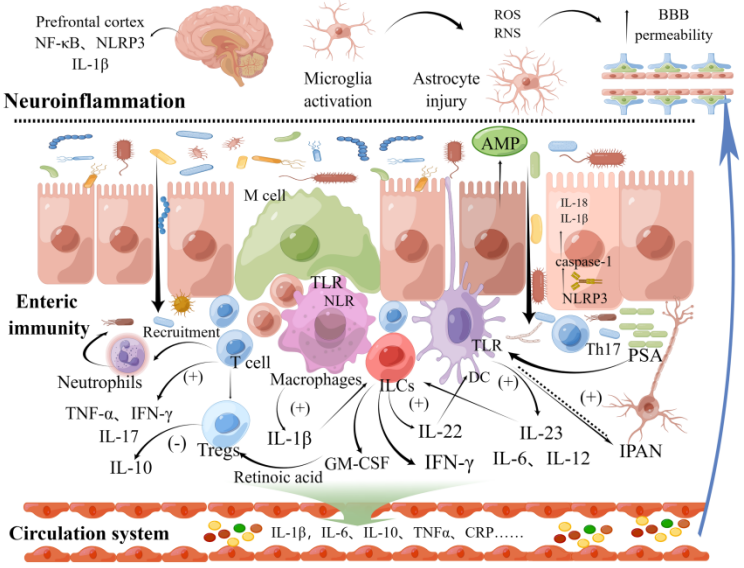
- **Immunization pathway**

  Enteric immune response

  Systemic inflammatory response

  Neuroinflammation

- **Neural pathway**



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Clinical implications

- **Dietary strategies to regulate microbiota**

  Dietary fiber, Probiotics, Prebiotics, Synbiotics……

- **Traditional drugs and ingredients for regulating microbiota**

  Xiaoyao pills, Chaihu shugan San, Tiansi Liquid, Kai-Xin-San

  Semen Cuscutae, Morinda officinalis oligosaccharides

  Coniferyl ferulate, Crocetin

- **Other therapeutic methods to regulate microbiota**

  Rifaximin, COX-2 inhibitors, Electroacupuncture treatment

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Figure 4