

Schizophrenia and obesity: may the gut microbiota serve as a link for the pathogenesis?

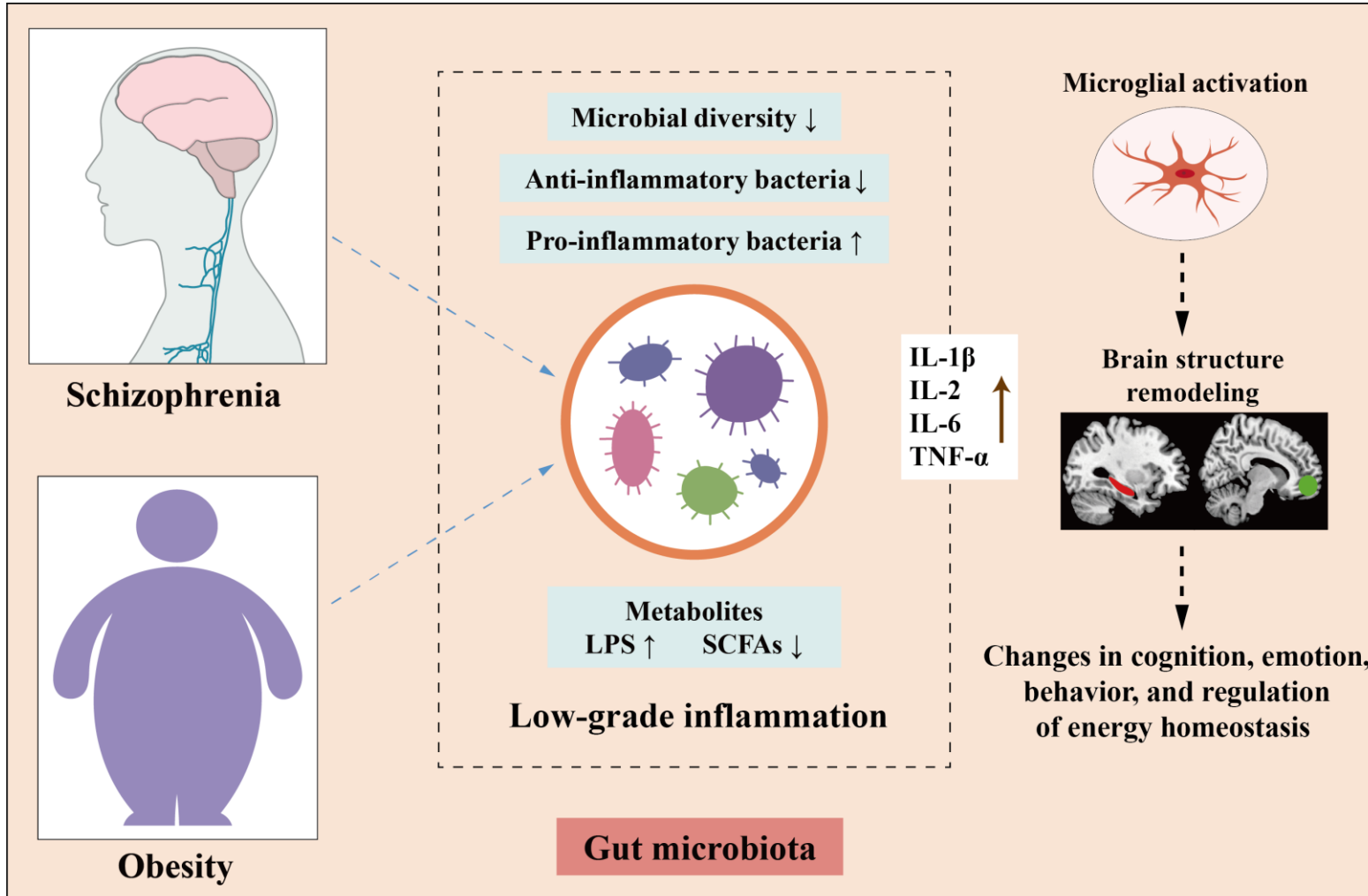
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Introduction



- Obesity represents a major challenge to the clinical management of schizophrenia and contributes to worse psychiatric outcomes in schizophrenia.
- Perturbations in gut-brain axis, particularly gut-derived inflammation, are closely related to the pathogenesis of both schizophrenia and obesity, suggesting that gut microbiota may be a potential hub linking these two disorders.

Role of gut microbiota in the schizophrenia and obesity

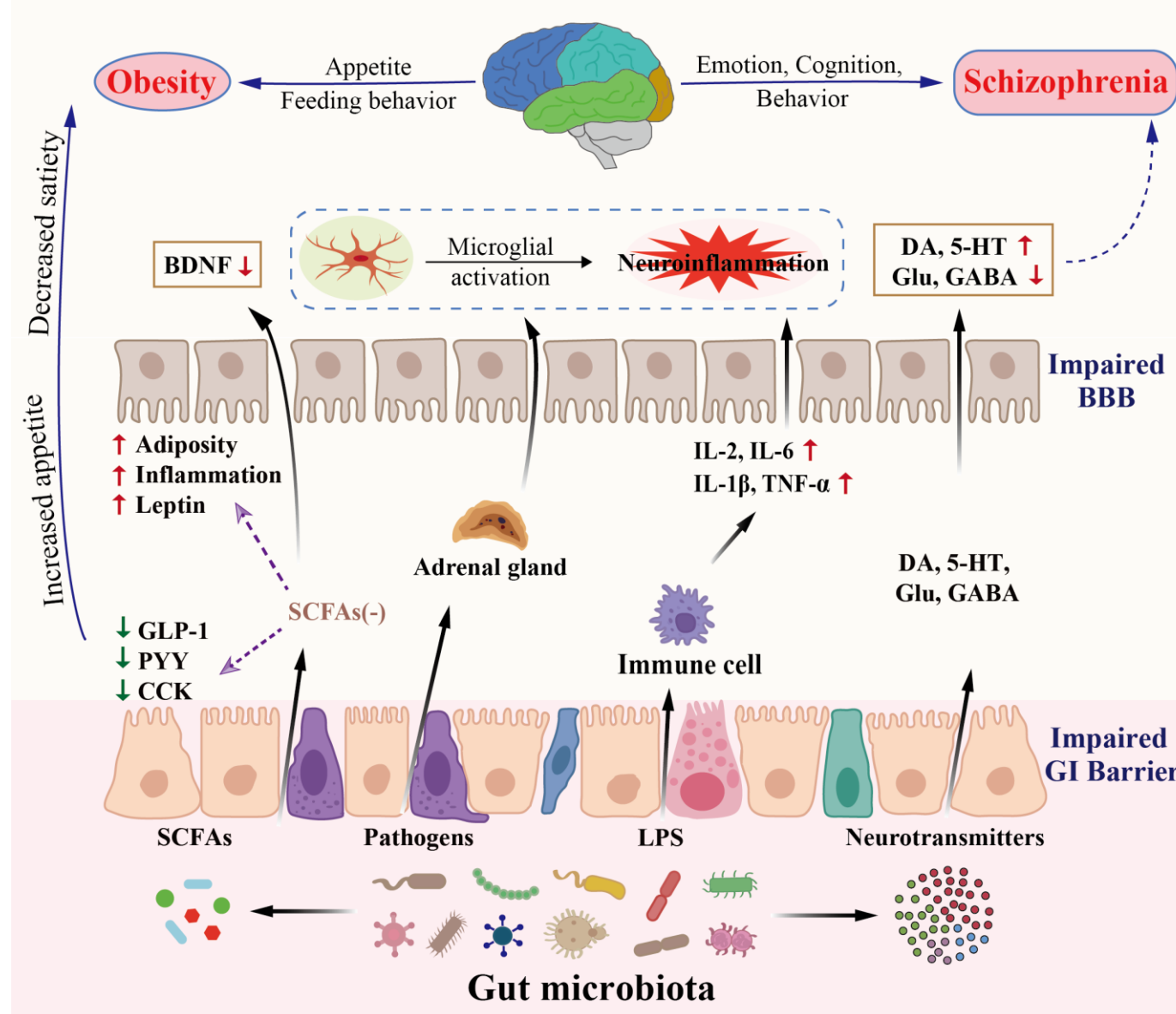


Figure 1. Role of gut microbiota in the pathophysiology of schizophrenia and obesity.

Gut microbiota and schizophrenia

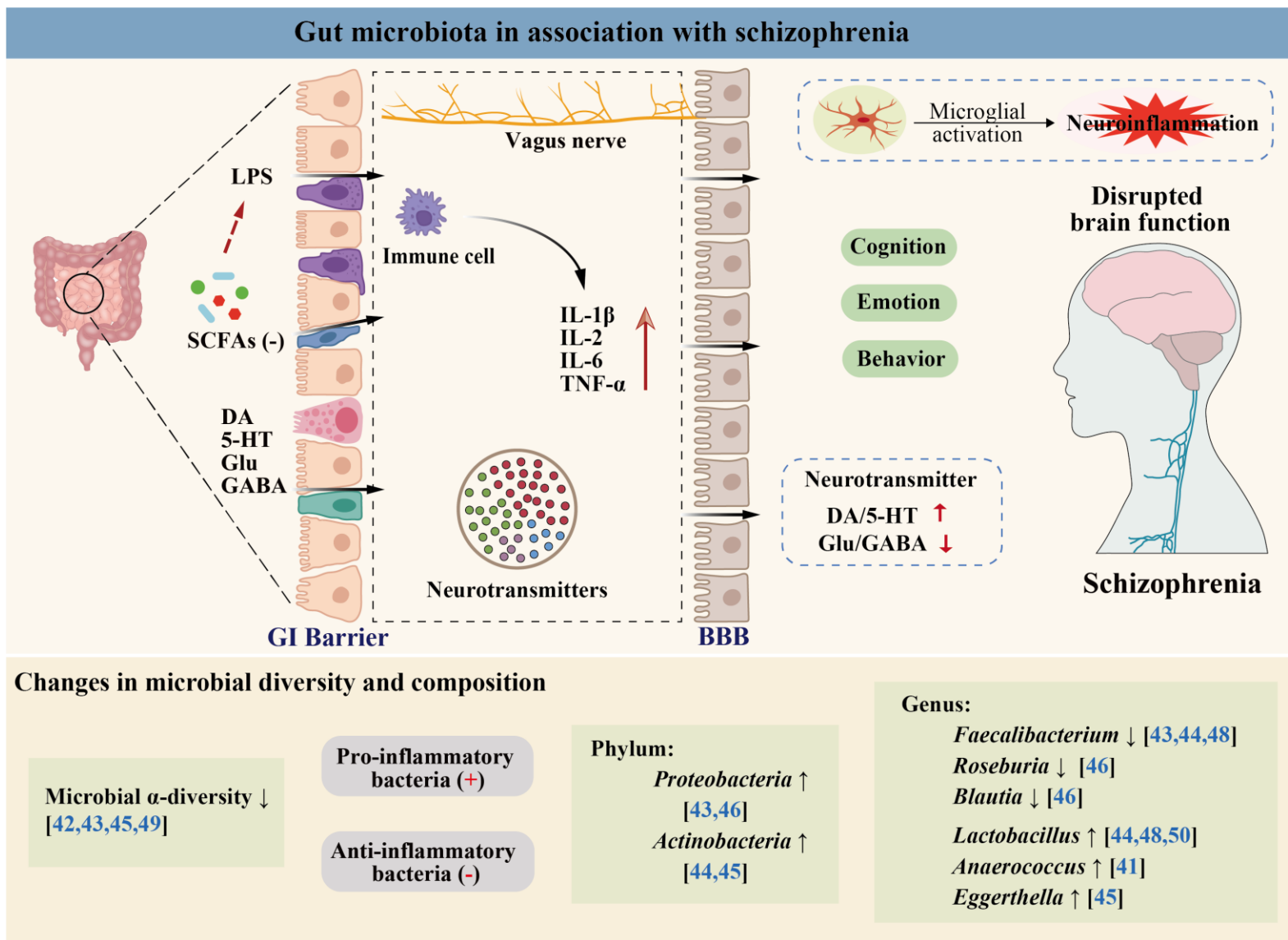


Figure 2. Gut microbiota in association with schizophrenia.

Gut microbiota and schizophrenia

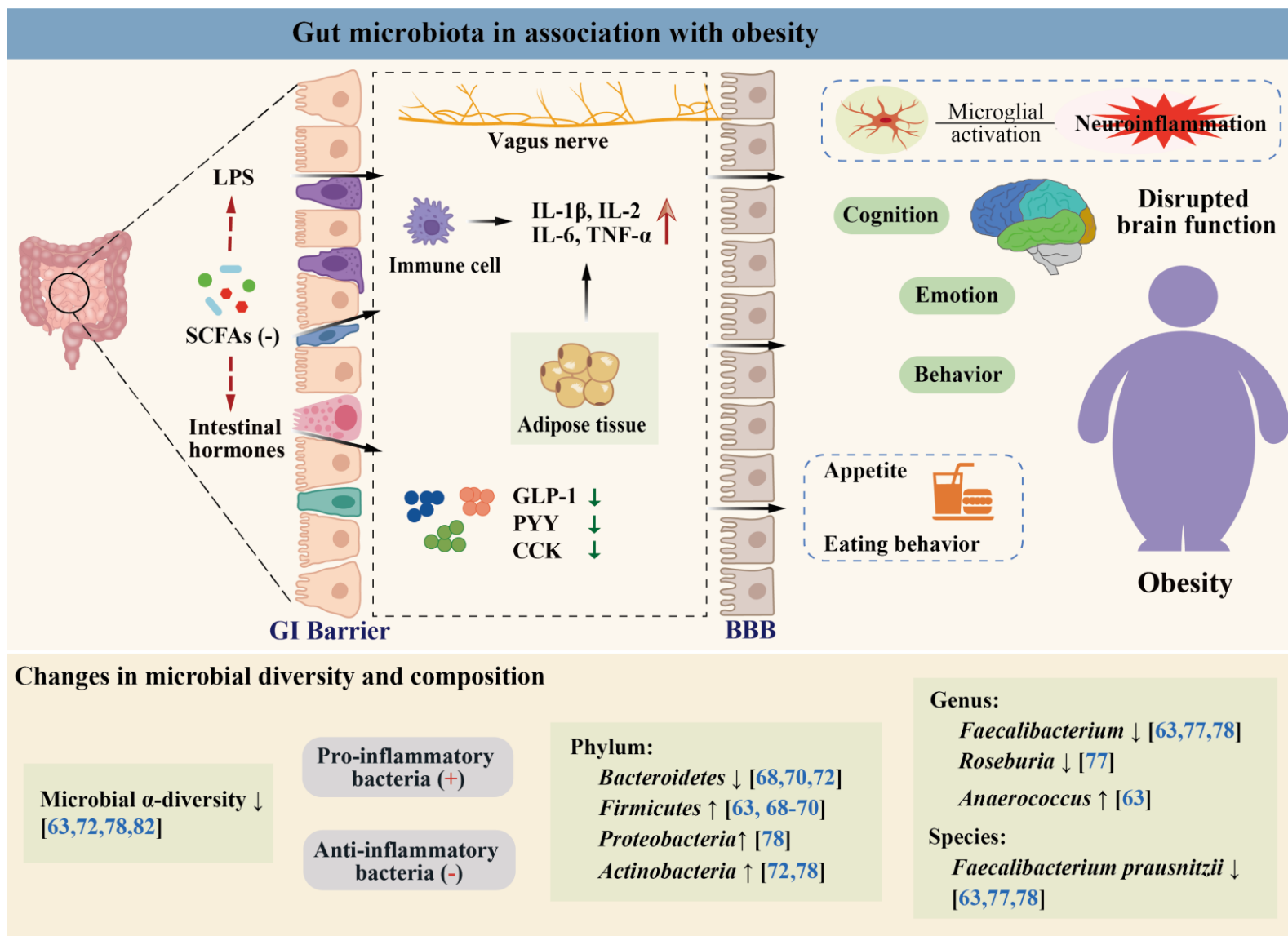
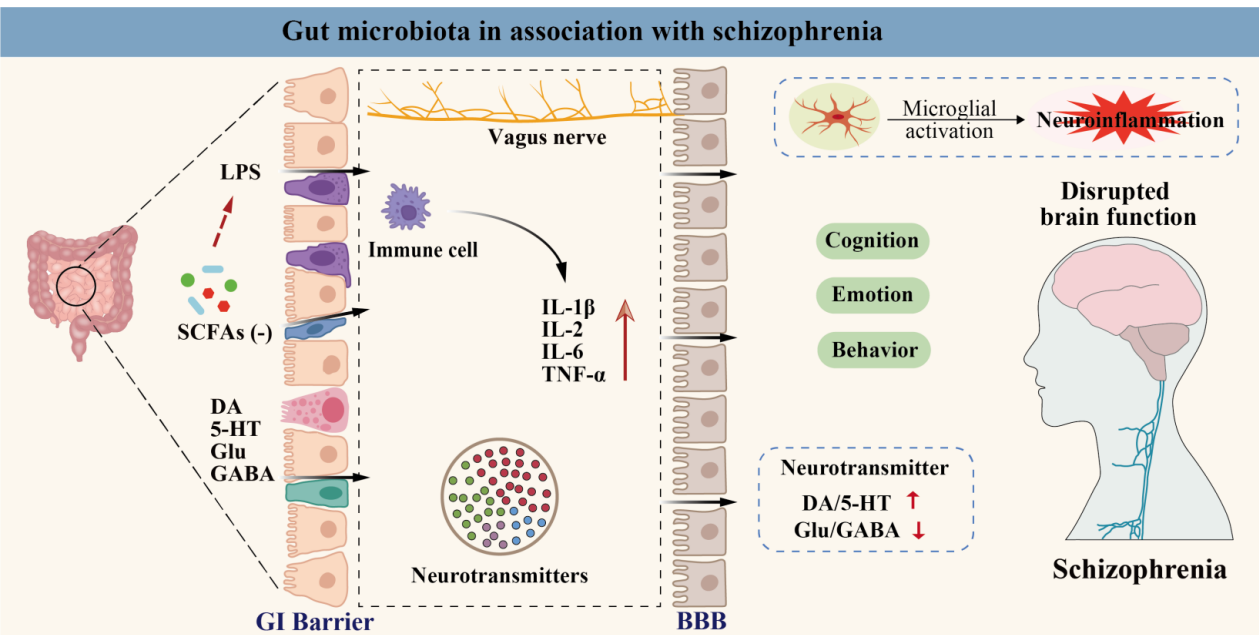


Figure 3. Gut microbiota in association with obesity.

Shared gut microbial features



Changes in microbial diversity and composition

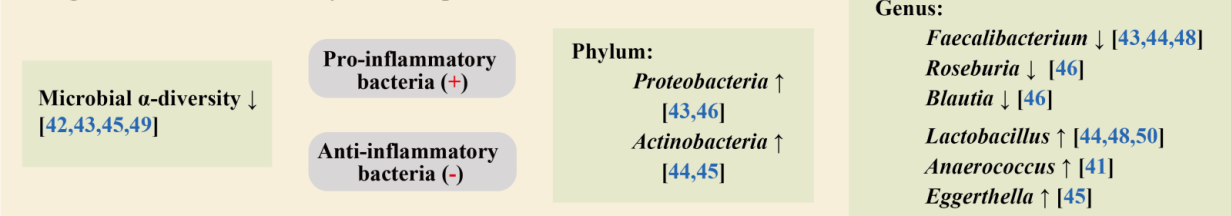
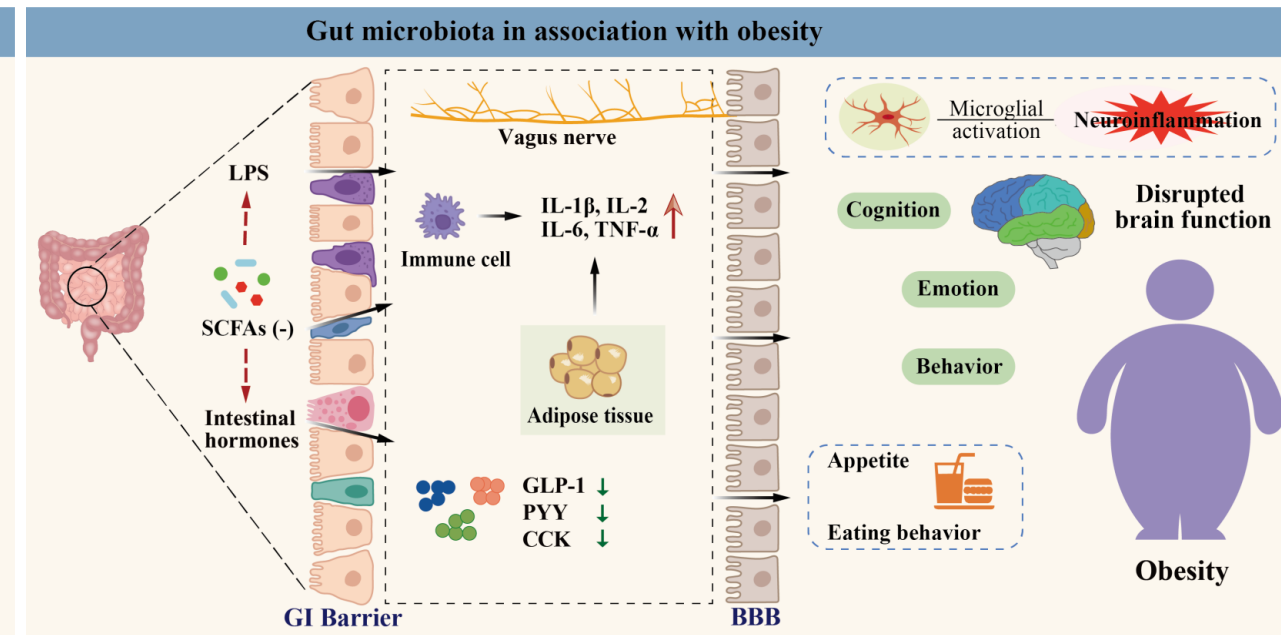


Figure 2. Gut microbiota in association with schizophrenia.

A decrease in microbial diversity; a decrease in anti-inflammatory bacteria (e.g., genera *Faecalibacterium* and *Roseburia*); an increase in pro-inflammatory bacteria (e.g., phylum *Proteobacteria* and genus *Anaerococcus*).



Changes in microbial diversity and composition

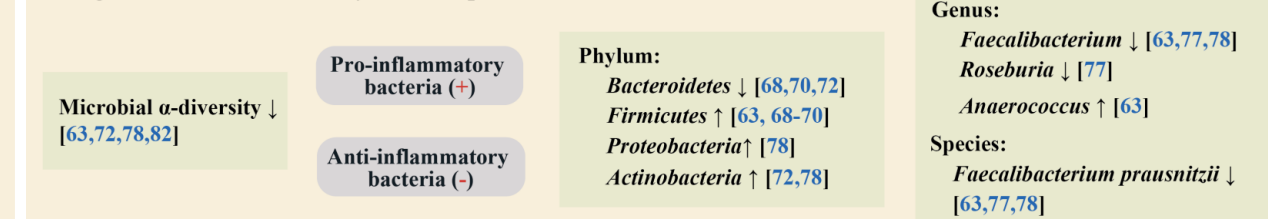


Figure 3. Gut microbiota in association with obesity.

Gut-derived inflammation as potential hub linking SZ and obesity.

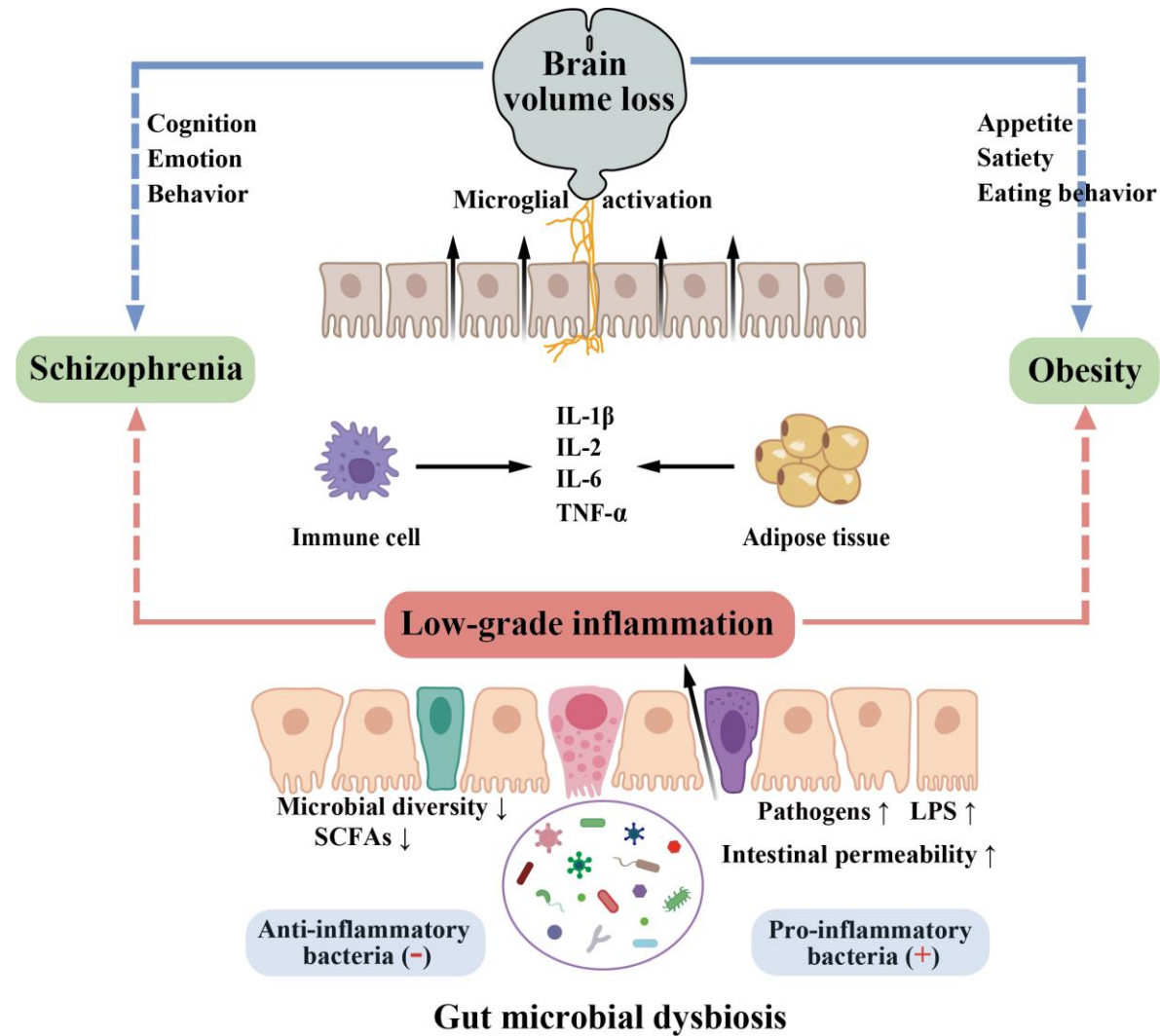


Figure 4. Gut-derived inflammation as potential hub linking schizophrenia and obesity.

Potential therapeutic options

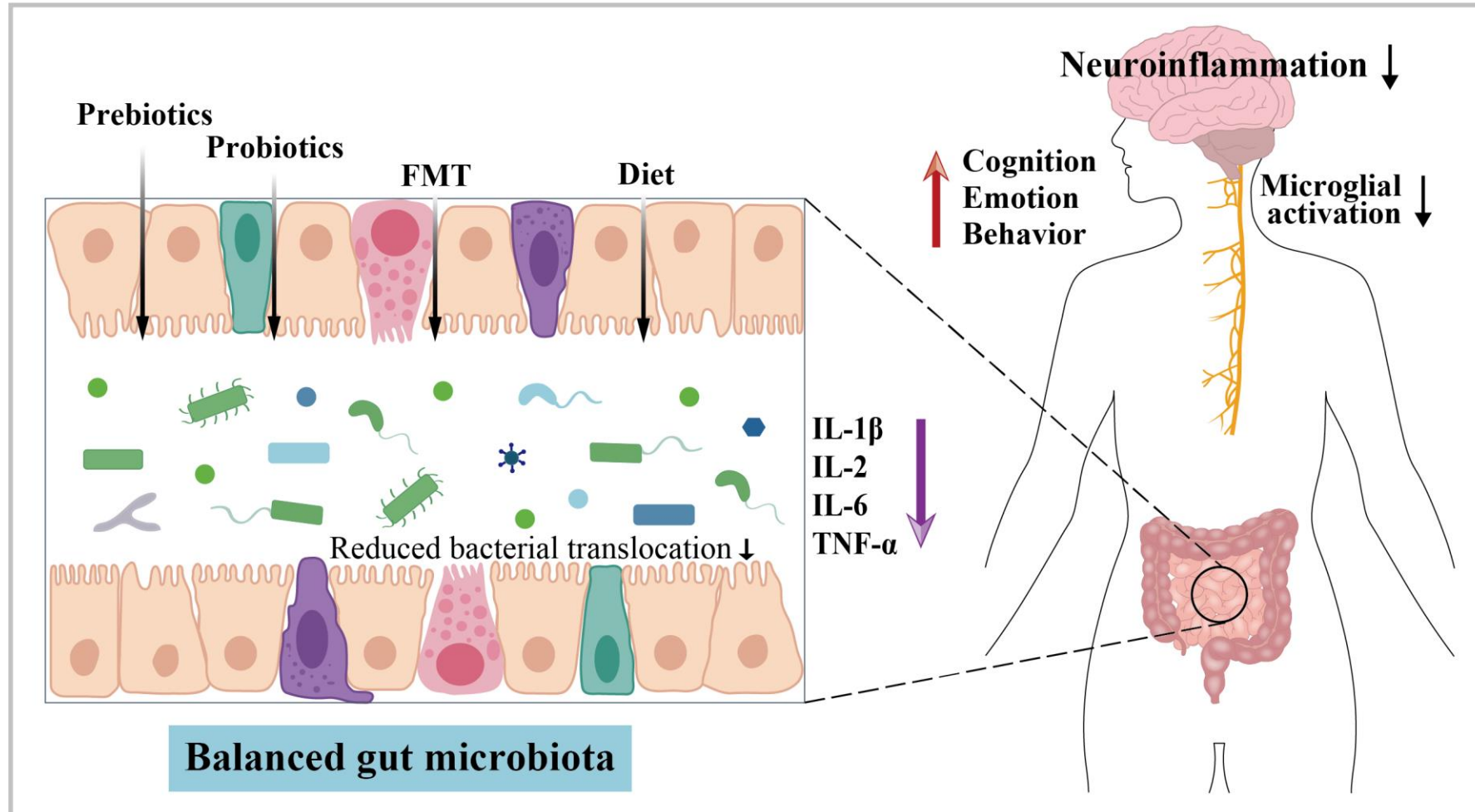


Figure 4. Gut-derived inflammation as potential hub linking schizophrenia and obesity.

Challenges and Possible solutions

Challenges

- Cross-sectional design with small sample sizes
- Demographic parameters and clinical features of the disease are not well evaluated
- Heterogeneity in fecal sample collection, storage, and analysis methods
- Research on gut microbiota in SZ patients with comorbid obesity and its relationship with brain imaging features is still in its infancy

Possible solutions

- Longitudinal research should be conducted to clarify the causal relationship between gut microbiota and diseases.
- Accurately identify and profile personal and disease-related characteristics linked with gut microbiota
- A systematic protocol for handling stool samples should be developed
- Focus more on the gut microbial alterations in SZ patients with obesity

Summary

Systematic Review

- Comprehensive overview of the concept, composition, influencing factors, and the critical role of the gut microbiota in human health and diseases.
- Extensive summary of the relationship between gut microbiota and schizophrenia and obesity.

Summarize novel perspectives

- Shared gut microbial features between SZ and obesity.
- Gut microbiota-derived inflammation as a potential link between the two diseases.

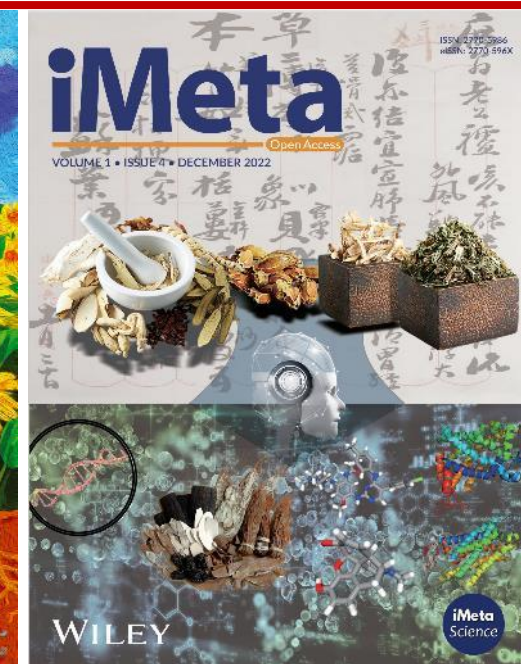
Potential therapeutic options

- Dietary modifications, pro/prebiotics, and FMT

Challenges and solutions

- Therapeutic potential of the gut microbiota, its temporospatial dynamics, its mechanistic interaction with the host, and the crosstalk between the gut and the brain.
- Emphasis should be placed on the elimination of potential confounding factors, and the implementation of large sample, longitudinal studies

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