



The Impact of Gut Microbiota on Immune System Function and Inflammatory Diseases

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Abstract

Therapeutic interventions and future directions

Therapeutic interventions targeting the gut microbiome have shown promise in clinical trials. Probiotics, prebiotics, and fecal microbiota transplantation (FMT) are being explored for their potential to modulate immune responses and reduce inflammation. Future research should focus on identifying specific microbial strains and their mechanisms of action, as well as developing personalized therapeutic strategies based on individual gut microbiome profiles.

Materials and Methods

Literature review

A comprehensive literature review was conducted to identify relevant studies on the impact of gut microbiota on immune system function and inflammatory diseases. The search included databases such as PubMed, Scopus, and Web of Science, using keywords related to gut microbiota, immune system, and inflammation.

Study selection criteria

Studies were selected based on the following criteria: (1) relevance to the research topic, (2) methodological quality, (3) publication date (within the last 10 years), and (4) availability of full-text articles. The search results were screened by two independent reviewers (A.B. and C.D.) to ensure consistency and accuracy in the selection process.

Data extraction and synthesis

Data extraction and synthesis were performed using the PRISMA 2020 flow diagram. The PRISMA 2020 flow diagram is a standardized reporting tool for systematic reviews, which helps to visualize the search and selection process. The diagram shows the number of records identified, screened, excluded, and included in the final synthesis.

PRISMA 2020 flow diagram: 5(3) / -1.575 (4) -566 0.008 / 10 0 0 10.)

...with the immune system.

Discussion

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Mechanisms of gut microbiota modulation of immune function

... (A), ... (B), ... 8, ... (A), ... (B), ...

Clinical implications and therapeutic strategies

... B ... 9, ... A ...

Future directions in research

... A ... A ...

10. ...

Conclusion

... A ...

References

1. Yacyshyn B, Meddings J, Sadowski D, BowenYacyshyn MB (1996) sclerosis patients have peripheral blood CD45RO+ B cells and increased . Dig Dis Sci 41: 2493-2498.
2. Alves de Lima K, Rustenhoven J, Da Mesquita S, Wall M, Salvador AF, et al. Meningeal $\beta\delta^+$ T cells regulate anxiety-like behavior via IL-17a signaling in neurons. Nat Immunol 21(11): 1421-1429.
3. Tannock GW, Crichton CM, Savage DC (1987) A method for harvesting non-cultivable filamentous segmented microbes inhabiting the ileum of mice. FEMS Microbiol Ecol 45: 329-332.
4. Xavier RJ, Podolsky DK (2000) How to get along: Friendly microbes in a hostile . Science 289: 1483-1484.
5. Corona AW, Huang Y, O'Connor JC, Dantzer R, Kelley KW, et al. (2010) Fractalkine Receptor (CX3CR1) Deficiency Sensitizes Mice to the Behavioral Changes Induced by Lipopolysaccharide. J Neuroinflammation 17(7): 93.
6. Teitelbaum JE, Walker WA (2002) Nutritional impact of preand probiotics as . Annu. Rev Nutr 22: 107-138.
7. Wykes M, Pombo A, Jenkins C, MacPherson GG (1998) Dendritic cells interact

directly with naïve B lymphocytes to transfer antigen and initiate class switching
