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MICROBIOME DYSBIOSIS AND DISEASE: A COMPREHENSIVE REVIEW

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The human microbiome plays a crucial role in maintaining health, with dysbiosis of the gut microbiota being associated with various diseases. Dysbiosis refers to an imbalance in the composition, function, or distribution of the gut microbiota, leading to disruptions in the symbiotic relationship between the host and the microbial community. This imbalance can manifest as a loss of beneficial organisms, overgrowth of potentially harmful bacteria, and reduced microbial diversity.

Recent research has highlighted the impact of dysbiosis on inflammatory bowel diseases (IBD), obesity, allergic disorders, type 1 diabetes mellitus, autism, and colorectal cancer in both human and animal models.

Understanding the intricate interplay between the microbiome and disease pathogenesis is essential for developing targeted therapeutic strategies to restore microbial balance and ameliorate disease activity. Advances in high-throughput sequencing technologies have enabled detailed profiling of microbial communities, shedding light on specific alterations associated with different diseases. Targeted interventions aimed at modulating the microbiota composition hold promise for mitigating disease progression and improving patient outcomes.

This review aims to explore the implications of microbiome dysbiosis in various diseases, emphasizing its role in IBD such as Crohn's Disease and Ulcerative Colitis, along with other dysbiosis-associated conditions. By elucidating the mechanisms underlying dysbiosis-related pathologies, novel treatment approaches can be developed to harness the therapeutic potential of restoring microbial equilibrium.

Dysbiosis, characterized by alterations in the composition and function of the microbiome, has been implicated in the pathogenesis of numerous diseases. The mechanisms underlying the impact of dysbiosis on disease development are discussed, highlighting the importance of microbial diversity, host-microbe interactions, and environmental factors. Additionally, potential therapeutic strategies targeting the microbiome to restore homeostasis and prevent disease progression are explored.

Overall, a better understanding of microbiome dysbiosis holds promise for the development of novel diagnostic and therapeutic approaches for a wide range of diseases.