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The Role of the Human Gut Microbiome on Colon Cancer: Effect on Development of Cancer and Healing Process

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Abstract : Within my limited understanding, several studies have come out on the significant role that microbiome plays in human health, specifically pointing out its role in cancer. To date, such studies have been limited to examining changes in the intestinal microflora in patients with colorectal cancer, which have already been studied and published. Until this point, only the bacteria have been the center of attention for over the past ten years with little regard to the other elements known to comprise the gut antimicrobial agents…. The term 'microbiota' includes all the microbial consortia associated with the human body, including bacteria, fungi, archaea, and viruses. Dysbiosis is a relative adjective depicting an imbalanced condition in the ecosystem, which gives room for clinical payoffs because, in the absence of a particular symbiont, few pathological conditions tend to arise. It has also been shown that changes in the protozoan microbial flora increase the risk of the host developing colorectal tumors. Research has found that certain bacteria such as Enterotoxigenic Bacteroides fragilis (ETBF), Bacteroides thetaiotaomicron (B. theta), etc, can activate inflammatory responses which later lead to the development of cancer in the colon. These microorganisms can contribute to cancer development through mechanisms including the production of carcinogenic metabolites and modulation of the immune response. Furthermore, the composition of gut microbiota differs markedly between healthy individuals and those diagnosed with CRC, highlighting the potential of microbial profiling as a biomarker for cancer risk and progression. The connection between gut microbiome composition and CRC also raises several controversies and therapeutic implications. While some studies suggest that restoring microbial balance through interventions like probiotics or fecal microbiota transplantation (FMT) may enhance treatment efficacy and improve immune responses, the variability in microbiome composition and individual responses complicates the establishment of universal treatment guidelines. Additionally, dietary factors and lifestyle choices play pivotal roles in shaping the gut microbiome, which further emphasizes the need for personalized approaches in cancer prevention and therapy. In summary, the gut microbiome represents a critical component in the landscape of colon cancer research, with ongoing studies aiming to elucidate its mechanisms, therapeutic potential, and implications for cancer treatment. The interplay between microbial communities and host physiology continues to highlight the need for further exploration to unlock innovative strategies for CRC prevention and management.

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