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**Fasting-mimicking diet-enriched Bifidobacterium pseudolongum suppresses colorectal cancer**

**Nan K, Zhong Z, Yue Y, *et al.* Fasting-mimicking diet-enriched Bifidobacterium pseudolongum suppresses colorectal cancer by inducing memory CD8+ T cells. *Gut* 2025; 74(5): 775-786. doi: 10.1136/gutjnl-2024-333020.**

The fasting-mimicking diet (FMD), a low-calorie, low-protein regimen, has shown anti-neoplastic effects and can mitigate side effects of anticancer treatments. This study investigates FMD’s impact on gut microbiota enrichment and its role in tumour suppression.

Researchers assessed probiotic species enrichment in CRC-afflicted mice undergoing FMD, verifying candidate species in germ-free and antibiotic-treated mouse models. They also identified microbiota-derived anti-tumour metabolites via metabolomic profiling. The study included two cohorts: CRC patients who provided tumour tissues for microbiota and immune response analysis, and a trial group undergoing FMD.

FMD led to higher microbial diversity, particularly Lactobacillus, Bifidobacterium, and Staphylococcus, with increased Limosilactobacillus reuteri (L. reuteri) and B. pseudolongum abundance. In germ-free mice, FMD had no anti-tumour effect unless B. pseudolongum was supplemented, demonstrating its essential role. Similar findings were observed in CD8+ TRM (cluster of differentiation 8 tissue-resident memory) T cell activation, with B. pseudolongum rescuing FMD’s effects via L-arginine metabolism.

Additionally, B. pseudolongum mimicked and enhanced CTLA-4 (Cytotoxic T-lymphocyte associated protein 4)-mediated anti-tumour effects. Multivariate analysis showed that high CD8+ TRM infiltration and B. pseudolongum abundance correlated with prolonged survival.

The study concludes that FMD-induced anti-tumour effects in CRC are gut microbiota-dependent, particularly involving Bifidobacterium, Lactobacillus, and B. pseudolongum. These findings offer potential applications alongside immunotherapy, improving tumour shrinkage while reducing side effects. Future research could exploit these mechanisms for novel treatment and prevention strategies in CRC.