

Probiotic Intervention in Colorectal Cancer: The Protective Role of Bifidobacterium Against Gut Dysbiosis

Ms. Mayuri Arvind

St. Joseph's College of Engineering, Semmancheri, Chennai, Tamil Nadu, India

Dr. L.F.A. Anand Raj

St. Joseph's College of Engineering, Semmancheri, Chennai, Tamil Nadu, India

Abstract:

Colorectal cancer is among the leading causes of cancer deaths worldwide. Recent research indicates that gut dysbiosis, or the gut microbiota dysbiosis—an imbalance in the composition of intestinal microorganisms—plays a crucial role in the initiation and progression of Colorectal cancer due to the increase in opportunistic bacteria and other factors. Dysbiosis leads to chronic inflammation, disrupts the mucosal barrier, interferes with host immune responses and produces genotoxic metabolites. These genotoxic metabolites include secondary bile acids and hydrogen sulfide. Bacteria such as *Fusobacterium nucleatum*, *B. fragilis* and *E. coli* with pks island have been linked to DNA damage and pro-tumorigenic signaling pathways. Thus, there is an urgent need for a non-invasive, microbiota-targeted strategies to prevent or slow down the colon cancer progression. Probiotic bacteria such as *Bifidobacterium* have shown great potential in restoring microbial balance, reducing the inflammation, producing anti-cancer metabolites and inhibiting oncogenic pathways such as NF- κ B and Wnt.

Keywords:

Colorectal cancer, gut microbiota, gut dysbiosis, genotoxic metabolites, Bifidobacteria, probiotics, inflammation.