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Authors' Bios and Abstracts

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Increasing serum propionate by prebiotics reduces cancer cell proliferation in the liver

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Metabolites released by the gut microbiota may influence host metabolism and immunity. We have tested the hypothesis that a prebiotics, such as inulin-type fructans (ITF), by promoting microbial production of short chain fatty acids (SCFA), influences cancer cell proliferation outside the gut. Mice transplanted with Bcr-Abl-transfected BaF3 cells, received ITF in their drinking water. Gut microbiota was analyzed by 16S rDNA PCR-DGGE and qPCR. Serum SCFA were quantified by UHPLC-MS. Cell proliferation was evaluated *in vivo*, by molecular biology and histology, and *in vitro*. Gut microbiota composition is modified in case of leukemia and by ITF treatment. ITF administration reduces hepatic BaF3 cell infiltration, lessens inflammation and increases portal propionate concentration. *In vitro*, propionate reduces BaF3 cell growth through a cAMP-dependent pathway. Furthermore, the activation of G-coupled protein receptor 43 (GPR43), a Gi/Gq-coupled protein receptor that binds propionate, by a synthetic agonist, lessens the proliferation of BaF3 and other human cancer cell lines. We show for the first time that the fermentation of nutrients like ITF into propionate can counteract malignant cell proliferation in the liver tissue. Our results support a role of GPR43 activation as a new strategy for cancer therapeutics. This study highlights the importance of research focusing on gut microbes-host interactions for managing systemic and serious diseases, such as leukemia.