Immunomodulation of Human Leukemia Cell Lines by Components of Probiotic Sources

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Probiotic bacteria have been intensively studied for their role in the gut microbiome and digestion. Research into the abilities of probiotic bacteria to fight pathogens is also a growing area of research today. In initial stages of this research, components of various probiotic sources including yogurt, human milk, and colostrum (the first milk a mother produces) were seen to possess antibacterial capabilities against pathogenic bacteria. In continued research, a more in-depth study of the way probiotic bacteria interact with the immune system was performed. The effects of these components of various probiotic sources on activation of Jurkat cells and THP-1 cells were studied. Both cell lines are Leukemia cells, and activation markers were used to measure activation. Probiotic components were first extracted from sources by centrifugation and passing through a syringe filter. Cell lines were grown and added to a well plate and incubated with components at 2.5% v/v and 5% v/v for 48 h. FACS staining was performed with specific antibodies coupled to fluorophores, and stained samples were acquired using a flow cytometer. Results showed that homemade and commercial yogurt components increased activation of Jurkat cells up to 70%, as well as THP-1 cells, showing immunostimulatory properties. Human colostrum and human milk components induced cell death of Jurkat cells and THP-1 cells, showing anti-cancer characteristics. The results observed indicate immunomodulatory capabilities of probiotic sources, showing their role in enhancing innate and adaptive immunity, leading to pathways for treatments for autoimmune diseases, bacterial infections, and cancers.

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