

Interleukin-4 may suppress expression of E-type prostanoid receptor4 in human colorectal cancer HCA-7 cells.

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The number of morbidities and mortalities by colorectal cancer are increasing year by year, therefore the development of innovative new therapeutic agents is desired. We have been reported that E-type prostanoid receptor4 (EP4 receptor), a family of G protein-coupled receptor, is a key receptor for colorectal cancer development. In the mean time, the epidemiological studies have reported that allergic patients have a 20% decrease in both morbidities and mortalities by colorectal cancer. However, the detailed mechanism is not clear. One of the well known factor for allergy is interleukin-4 (IL-4), which production is enhanced during this disease. The purpose of this study is to analyze the effects of IL-4 on EP4 receptor-mediated signaling in human colorectal cancer HCA-7 cells. Western blotting analysis revealed that treatment with IL-4 significantly decreased the expression of EP4 receptors in HCA-7 cells. Furthermore, IL-4 treatment was found to significantly inhibit the induction of cyclooxygenase-2 (COX-2), a prostaglandin E₂ (PGE₂) producing enzyme. Since COX-2 expression is previously found to be mediated by the activation of EP4 receptors, these results strongly suggest that one possible protective effect of allergy on colorectal cancer development may be involved in IL-4 that would suppress PGE₂-EP4 receptor-mediated cancer signaling pathways.