

Immune study shows astaxanthin stronger than beta carotene and canthaxanthin (abstract)

Possible immunomodulating activities of carotenoids in in vitro cell culture experiments.

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Immunomodulating activities of beta-carotene and carotene-associated carotenoids such as canthaxanthin (beta, beta-carotene-4,4 dione) and astaxanthin (3,3'-dihydroxyl beta, beta-carotene 4,4-dione) were analyzed by in vitro cell culture experiments. (i) beta-Carotene, canthaxanthin and astaxanthin caused significant stimulatory effects on the cell proliferative response of spleen cells and thymocytes from BALB/c mice at the concentrations of 2×10^{-8} to 10^{-7} M, although they showed the activities different from each other. (ii) Astaxanthin exhibited the highest activity on the polyclonal antibody (immunoglobulin M and G) production of murine spleen cells at the concentrations of 2×10^{-8} to 10^{-7} M but beta-carotene did not cause a significant effect at a low concentration (2×10^{-8} M) although stimulated at a high concentration (2×10^{-7} M). Canthaxanthin expressed moderate activities at the same concentrations. (iii) All tested carotenoids significantly enhanced the release of interleukin-1 alpha and tumor necrosis factor-alpha from murine peritoneal adherent cells at the concentrations of 2×10^{-8} to 10^{-7} M and the ranks of cytokine-inducing activities were astaxanthin > canthaxanthin > beta-carotene. These results indicate that carotenoids such as beta-carotene, canthaxanthin and astaxanthin have possible immunomodulating activities to enhance the proliferation and functions of murine immunocompetent cells.

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