

OPE8) Nanosphere Form of Astaxanthin Restores the Mucin Depletion Induced by *V. vulnificus*

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Abstract

Astaxanthin, a natural carotenoid component of shrimp, has been used as a food additive for the treatment of various diseases, but a functional role of Astaxanthin Nanosphere (AN) in the regulation of intestinal mucin (Muc) 2 production during bacterial infection has not described yet. In this study, we have investigated the effect of AN prepared from astaxanthin during Muc2 repression elicited by the Gram-negative bacterium *V. vulnificus* in human gastrointestinal epithelial (HT-29) cells. AN significantly inhibited the level of ROS production and PKC activation in recombinant protein (r) VvpE-stimulated HT-29 cells. Moreover, AN inhibited the PKC-mediated phosphorylation of extracellular signal-regulated kinase and nuclear factor-kappa B responsible for region-specific hypermethylation in the Muc2 promoter in rVvpE-treated HT-29 cells. In the mouse models of *V. vulnificus* infection, treatment with AN maintained the level of Muc2 expression in the intestine. On the basis of these results, we suggest that AN blocks the hypermethylation of the Muc2 promoter to restore the level of Muc2 production in HT-29 cells infected with *V. vulnificus*.

Key words : Astaxanthin nanosphere, Mucin, *Vibrio vulnificus*