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Omega-3 fatty acids and cancer prevention

The evidence for omega-3 fatty acid (FA) involvement in cancer has generally been equivocal. However, considerable circumstantial evidence has accrued from both experimental animal and human clinical studies that support a role for omega-3 FA in the prevention of non-melanoma skin cancer (NMSC). Direct evidence from animal studies has shown that omega-3 FA inhibit ultraviolet radiation (UVR) induced carcinogenic expression. In contrast, increasing levels of dietary omega-6 FA exacerbate NMSC. Both omega-3 and omega-6 FA are essential and exhibit only minor structural differences. Nevertheless, these differences lead to differential metabolites, as these FA are metabolized through the lipoxygenase (LOX) and cyclooxygenase (COX) pathways. These metabolites are influential in inflammatory and immune responses involved in carcinogenesis. Clinical studies have shown that omega-3 FA ingestion protects against UVR-induced genotoxicity, raises the UVR-mediated erythema threshold, reduces the level of pro-inflammatory and immunosuppressive prostaglandin E_2 (PGE_2) in UVR-irradiated human skin and appears to protect human skin from UVR-induced immune suppression. Thus, there is considerable evidence, albeit circumstantial, that omega-3 FA supplementation might be beneficial in reducing the occurrence of NMSC, especially in those individuals who are at highest risk.

Biography

Homer S Black has received his BSc from Texas A&M University, MEd from Sam Houston State University, MS Administration (Business/Health Science Management) from the University of Houston and PhD from LSU in Plant Biochemistry in 1964. He has joined the Faculty at Baylor College of Medicine and the Houston Veterans Affairs Hospital as a Physiologist in 1968. His research interests have centered on UVR-induced skin cancer and antioxidant and dietary lipid modulation of this most common cancers. He became Professor Emeritus in 2003.

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