



CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP150195

Project Title:
Mechanisms of DHA and EPA differential effects on colon cancer chemoprevention

Award Mechanism:
Individual Investigator Research Awards for Prevention and Early Detection

Principal Investigator:
Shureiqi, Imad

Entity:
The University of Texas M.D. Anderson Cancer Center

Lay Summary:

Colon cancer is the second most common cause of cancer death in the United States. Despite progress in prevention and treatment of colon cancer, the 5-year death rate from this disease remains almost 40%. Clearly, better measures to treat and prevent colon cancer are needed. Improved understanding of the mechanisms underlying the formation of colon cancer will provide key information needed to develop new preventive measures for this commonly fatal disease.

Fish oil and its omega-3 fatty acid derivatives eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) have been widely promoted to prevent chronic diseases. However, the effects of fish oil and DHA and EPA have been inconsistent in various human and animal studies. In particular, DHA and EPA appear to have opposite effects on colon cancer in studies of mice: EPA appears to inhibit colon cancer formation, but DHA appears to enhance colon cancer formation. Determining the factors influencing whether DHA and EPA have beneficial or harmful effects is important because DHA and EPA are widely used as dietary supplements and are also available as pharmaceuticals approved by the US Food and Drug Administration for treatment of hyperlipidemia.

The proposed studies will provide data to help us understand how different patients might respond differently to DHA and EPA according to their intestinal levels of 15-lipoxygenase-1 (15-LOX-1), an enzyme crucial for converting DHA and EPA to products that suppress inflammation and cancer. The information gained from the proposed studies could identify people who are at risk for deleterious effects of DHA supplements because they have impaired 15-LOX-1 production in the intestine. The information gained from the proposed studies could also improve our understanding of how to develop new chemopreventive interventions utilizing DHA and EPA to prevent colon cancer.