**Reference:**

Risk of Colorectal Cancer Is Linked to Erythrocyte Compositions of Fatty Acids as Biomarkers for Dietary Intakes of Fish, Fat, and Fatty Acids


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**Summary:**

This newly-published study from Japan examined the relationship between the risk of developing colorectal cancer and the omega-3 fatty acid status in the red blood cell membranes as a biomarker for physiological levels of DHA (docosahexaenoic acid), EPA (eicosapentaenoic acid), and other polyunsaturated fatty acids. The omega-3 fatty acid status was determined by gas-liquid chromatographic analysis in patients with confirmed colorectal cancer and non-cancer controls matched for age, gender, and time of collection.

The results indicated that those individuals with the highest levels (highest tertile (third)) of DHA in their circulating red blood cells (biomarker for DHA status) exhibited a 64% lower risk for colorectal cancer as compared to those with much lower levels of DHA (in the lowest tertile). No statistically-significant relationships were found for a-linolenic acid (a-LNA) levels or levels of EPA in relation to the risk of colorectal cancer in this population.

**Dr. Holub's Comments:**
The present results are of interest in view of a recent and extensive review article published in January of 2006 in the Journal of the American Medical Association (295:403-415) where no overall significant association for the risk of cancer was found in relation to omega-3 fatty acid consumptions based on 38 studies which were scrutinized. The present study contributes to previous evidence that certain types of specific cancers (such as colorectal cancer) may be a specific type of cancer which can be influenced by omega-3 fatty acid consumption from fish, fish oils, or other sources. In 2005, the European Perspective Investigation into Cancer and Nutrition based on a total of 478,040 participants followed over 4.8 years indicated that those with the highest intakes of fish per day (=80g of fish daily or the equivalent of approximately =3 fatty fish servings of six ounces each per week) were associated with an overall 30% reduced risk of colorectal cancer as compared to those consuming less than one fish serving (at 4 oz./serving) every three weeks. The authors of the present Japanese study suggest in their discussion that direct measurements of omega-3 fatty acid levels (including DHA) in blood samples may provide a more accurate assessment when attempting to relate omega-3 fatty acid status in humans to risk than fish intakes alone based on several variables (eg., the fatty acid fluctuations in different fish and other associated variables). While still unpublished in full manuscript form, scientists from the Harvard School of Public Health and the Brigham and Women's Hospital in Boston have very recently reported (Dr. J. Ma, senior author) that men who eat fish at least 5 times a week could potentially reduce the risk of developing colorectal cancer by 40% as compared to men who consumed fish less than once per week as reported in Boston this month at the American Association for Cancer Research's Frontiers in Cancer Prevention Research meeting.

It is noteworthy that no more than approximately 10% of North American adults are considered to eat fish 5 or more times per week. The potential mechanisms by which omega-3 fatty acids from fish (incl. DHA) could inhibit colorectal carcinogenesis may involve an attenuation of cyclooxygenase activity which converts AA (arachidonic acid, an omega-6 fatty acid) into various eicosanoids although other potential mechanisms need to be considered. In this regard, it is interesting to note that this recent study from Japan also reported a lower risk of colorectal cancer in those with higher levels of AA in their blood samples.