

Why Your Daily Fish Oil Pills May Not Be As Effective As You Think

A study by the University of Michigan found that the ALOX15 gene plays a decisive role in helping fish oil (EPA, DHA) to prevent colon cancer – opening up a potential new treatment direction.

About 19 million adults in the United States regularly take fish oil supplements in hopes of improving their health. These popular fish oil pills are rich in omega-3 fatty acids, particularly EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) — two compounds long thought to have anti-inflammatory properties and protect against chronic disease. However, the link between omega-3 intake and cancer prevention has never been clear.

In a newly published study, scientists from the University of Michigan and the MD Anderson Cancer Center (University of Texas) discovered that a gene called 15-lipoxygenase-1 (ALOX15) plays a key role in helping EPA and DHA be effective in preventing colorectal cancer.

The study, published in the journal *Cellular and Molecular Gastroenterology and Hepatology*, suggests that determining whether cancer patients carry the ALOX15 gene may be important when developing EPA and DHA supplementation regimens for prevention.

For years, large-scale clinical trials investigating the link between fish oil, omega-3s, and cancer have yielded mixed results. Some studies have suggested they may help reduce the risk of disease, while others have found little benefit or even a potential increased risk of cancer.

Unexpected results in animal models

In the new study, the authors compared the responses of two groups of mice: one group fed a diet supplemented with fish oil, the other group fed a normal diet. The results were surprising — fish oil actually increased the number of colon tumors in the mice that were stimulated with inflammation and were more likely to form tumors.

When DHA and EPA are consumed, they are converted into molecules called resolvins, which help to suppress chronic inflammation – a key factor in cancer development. However, this conversion process depends on the enzyme ALOX15, which is often turned off in many cancers.

In experiments on mice lacking the ALOX15 gene, the research team found that the number of tumors increased sharply when they were fed fish oil, although the levels were different between the two types of omega-3. In

which, EPA proved to be 'benign', causing fewer tumors than DHA.

Some common forms of EPA and DHA include free fatty acids, ethyl esters, and triglycerides. Lovaza, a drug containing the ethyl esters of EPA and DHA, is currently approved by the US Food and Drug Administration (FDA) for the treatment of high cholesterol.



Different form, different effect

The results showed that Lovaza, along with the ethyl ester and free fatty acid forms of EPA, reduced the number and size of tumors, especially in mice with the ALOX15 gene. In contrast, the DHA variants were unable to prevent tumor growth in the absence of ALOX15, although the presence of the enzyme still limited tumor growth somewhat.

' Not all fish oils are created equal, ' says Imad Shureiqi, a professor at the University of Michigan and a member of the Rogel Cancer Center. ' It's important to see if people have enough of the enzymes needed to metabolize these compounds, which can help prevent chronic inflammation and cancer risk. '

Although this research was primarily done in animals, the results suggest that if a person has colon polyps but lacks ALOX15, supplementing with EPA or DHA may be less effective in preventing tumor growth.

Professor Shureiqi recommends that people consult their doctor before taking fish oil supplements on their own, especially if they have digestive problems or a history of cancer.

The research team is currently continuing to develop drugs that can reactivate the ALOX15 gene in cancer cells, with the hope that this will help increase the effectiveness of EPA and DHA in preventing colon cancer in the future.

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