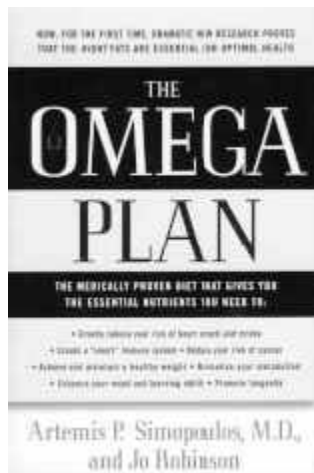


## Fighting Cancer with Omega-3 Fatty Acids

Excerpted from *The Omega-Plan* by Dr. Artemis P. Simopoulos, M.D.  
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When you have cancer you have to struggle with the chilling awareness that your own cells have turned against you. They have stopped responding to the instructions coded in their genes and begun transforming their energy into rampant growth. By and large, our efforts to tame the savage cell have proven disappointing. Since 1971, the federal government has spent \$30 billion on the War on Cancer. Nonetheless, the overall incidence of cancer has increased by 18%, and the cancer death rate has risen by 6%. Given our population increase, this means that twice as many people will be diagnosed with cancer compared with a similar time period in the 1970's and twice as many will die. Men have a one in two chance of having cancer sometime in their lives, partly due to the high rate of lung cancer and prostate cancer in older men. Meanwhile, American women have the world's highest death rates from lung and bronchial cancer. Cancers that are more common today than they were twenty years ago include breast cancer, prostate cancer, pancreatic cancer, melanoma, liver cancer, multiple myeloma, brain cancer, non-Hodgkin's Lymphoma, esophageal cancer, and chronic leukemia.



For decades, there has been a growing suspicion that there is a link between dietary fat and cancer, but the exact connection has been ambiguous. Some studies have shown that eating a high-fat diet increases the risk of cancer, but others have shown no connection. The source of the confusion is now becoming clear: different fats have different effects on tumor growth. As a rule, fats high in Omega-6 fatty acids promote malignant growth, while fats high in Omega-3 fatty acids block it. Thus, a given fat will either increase or decrease your risk of cancer depending on its fatty acid content. Ultimately it is the type of fat that matters, not the amount.

Researchers have been exploring the link between individual fatty acids and cancer for almost twenty years. Two people who are now pushing the frontier are Leonard A. Sauer and Robert T. Dauchy from the Cancer Research Laboratory at the Mary Imogene Bassett Hospital. Sauer and Dauchy wanted to know if all fatty acids had the same effect on tumor growth. If they found that some fatty acids promote tumor growth and others do not, then it might be possible to prevent or even treat cancer by eating a specific balance of fats. To find out, they perfected a

sophisticated technique that allowed them to infuse tumors growing in living animals with blood that had been mixed with known amounts of individual fatty acids. They found that tumors responded to fatty acids in dramatically different ways. When the tumors were infused with Omega-3 fatty acids, their growth rate was greatly slowed.

Three different groups have shown that Omega-3 supplements can reduce the rate of colon cancer. In a study that took place in Italy, for example, a group of patients with precancerous colon cells were given low daily doses of Omega-3 supplements. In just two weeks, the cells were growing at a more normal rate. The therapy was well tolerated and without side-effects. In 1996, Harvard Medical School researchers conducted a similar study that confirmed these results.

### How Do Omega-3 Fatty Acids Fight Cancer?

There are a number of theories to explain how Omega-3 fatty acids fight cancer. First, it has been shown that Omega-3 fatty acids reduce the amount of linoleic acid that tumors withdraw from the bloodstream, denying them a much needed nutrient. Blunting the cancer-promoting effects of linoleic acid in this manner is known as "competitive uptake." Second, Omega-3 fatty acids compete with Omega-6 fatty acids for enzymes that are needed for the creation of cancer promoting metabolites. Third, Omega-3 fatty acids make cancer cells more vulnerable to free-radical attack by making their membranes less saturated. A cancer cell will die if it sustains sufficient free-radical damage. Finally, research suggests that linoleic acid may help make cancer cells immortal by turning on a gene that prevents automatic cell death. By contrast, Omega-3 fatty acids seem to promote the self-destruction of cancer cells, increasing their rate of die-off and thereby slowing overall tumor growth.

### How Do Omega-3 Fatty Acids Keep Cancer From Spreading?

In order for cancer cells to migrate from the original tumor to form a distant colony, they must adhere to and then penetrate tough membranes called "basement membranes" that surround blood vessels and organs. Omega-3 fatty acids make it harder for cancer cells to cling to basement membranes by blocking the expression of molecules on the cell's surface (adhesion molecules) that provide the necessary

"grappling hooks." If cancer cells manage to attach themselves to the membranes, Omega-3 fatty acids can interfere with the next step by blocking the production of an enzyme called "collagenase" that is needed to dissolve basement membranes and allow cancer cells to penetrate the barrier.



Therapies that prevent existing tumors from spreading are critical to cancer therapy because most people die from tumors that colonize new areas of the body, not ones that remain in one place. It is very encouraging, therefore that there is new evidence that Omega-3 fatty acids might slow down the rate of metastasis. Recently, a group of French researchers monitored 120 breast cancer patients for a period of three years. They found that women with low amounts of LNA (Editors note: LNA is the Omega-3 from plant sources -such as flaxseed oil) in the fatty tissues surrounding their breasts were five times as likely to develop metastatic disease. This one factor alone was a better predictor of metastasis than all other traditional risk factors. The researchers concluded, "These data... stress the need for a close evaluation of the dietary intake of this essential fatty acid."

Lillian Thompson, a cancer researcher from the University of Toronto, has gone one step further and developed a pilot study to treat breast cancer patients with LNA. In an ongoing pilot study, she is giving flaxseeds to women recently diagnosed with the disease. She hopes to see a measurable reduction in tumor size in the short time between diagnosis and surgery.

There is already good evidence that Omega-3 fatty acids can help cancer patients recover from surgery. In a 1996 study, patients recovering from major gastrointestinal surgery were given Omega-3 supplements. The patients given the supplements fared much better than the ones given the standard postoperative treatment. They had fewer digestive problems, more normal liver and kidney function, lower triglycerides, and a 50 percent reduction in the number of postoperative infections. Said a member of the research team: "Clearly, the [Omega-3] group had all parameters shifted to a more favorable direction."

### **How Do Omega-3 Fatty Acids Enhance Radiation And Chemotherapy?**

Radiation and some types of chemotherapy kill cancer cells by generating large bursts of free radicals (highly reactive molecules) that attack the cells' membranes. Once a membrane sustains enough damage, the cell will self destruct. Omega-3 fatty acids make cancer cells more vulnerable to free radical attack, thereby enhancing the effects of both chemotherapy and radiation.

It may be years, if not decades, before "Omega-3 therapy" becomes an accepted part of cancer prevention and treatment, but you can take advantage of the new research right now by following **The Omega-Plan** by Dr. Artemis Simopoulos, M.D. available at a book store near you, or by calling 800/445-3529.