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## OMEGA-3 FATTY ACIDS AND IMMUNE FUNCTION

A 2011 study published in the medical journal *Pediatrics*

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showed that a woman who consumes fish oil-type supplements during pregnancy decreases the number of colds early in her baby's life. In fact, cold symptoms occurred 24 percent less often among babies whose mothers took fish oil during pregnancy than in those whose mothers didn't. Cold symptoms also resolved faster throughout the first six months of life for the supplement group compared with the placebo group.

This isn't the first study to show that mothers can give their kids a head start by supplementing with healthy fats in pregnancy. Other studies have shown supplementation with long-chain omega-3 fatty acids by pregnant women also improves brain function, promotes healthy vision and reduces the development of allergies in their babies.

These results are not surprising; after all more and more evidence is highlighting the critical roles that the long-chain omega-3 fatty acids EPA and DHA play in human health. Which begs the question: How can omega-3 fatty acids improve immune function and so many other body processes? The answer is simple: Omega-3s affect the membranes of cells throughout the body, including white blood cells.

#### **A cellular approach to health**

One of the key basic functions of every cell in the human body is to create homeostasis (the ability to maintain a constant and steady internal environment). The first step in achieving homeostasis is to create a healthy cell membrane, which is the wall between the internal cell and its external environment. Without a healthy membrane, cells lose their ability to hold water, vital nutrients and electrolytes—as well as their ability to communicate with other cells and be controlled by regulating compounds. They simply do not function properly.

Cell membranes are composed chiefly of fatty acids derived from the diet. As a result, the composition of cell membranes and the resulting structure, function and integrity can be influenced by dietary changes. A diet too heavy in saturated fat, animal fatty acids, cholesterol and trans-fatty acids produces cell membranes that are much less fluid in nature than the membranes of people who eat optimum levels of monounsaturated fat and EPA and DHA from fish oils, flax or algae.

#### **Omega-3s and white blood cell function**

In addition to their critical role in cell membranes, omega-3 fatty acids have also been shown to affect immune function



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This oft-overlooked B vitamin helps keeps skin smooth, nails supple and blood sugar in check. It's time to become more familiar with biotin.

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by:

- Regulating gene expression of white blood cells, basically helping to regulate proper immune function.
- Reducing the production of inflammatory compounds that can damage the immune system and lead to further inflammation.
- Improving the manner in which immune cells communicate with each other, leading to improved immune system function.

The net effect of all of these actions is that omega-3 fatty acids not only reduce the risk for infection and cancer, but they also help quell an overactive immune system in cases of allergies and autoimmune diseases like rheumatoid arthritis, lupus and multiple sclerosis.

### **Omega-3 fatty acids and prostaglandins**

In addition to their roles in cell membranes, EPA and DHA are also transformed into regulatory compounds known as prostaglandins. These compounds carry out many important tasks in the body: They regulate inflammation, pain, and swelling; play a role in maintaining blood pressure; and regulate heart, digestive and kidney function. Prostaglandins also participate in the response to allergies, help control transmission of signals along the nerves and help regulate the production of steroids and other hormones.

Through their effects on prostaglandins and related compounds, long-chain omega-3 fatty acids can mediate many physiological processes, making them useful in virtually every disease state and condition, including the following:

- Allergies
- Alzheimer's disease
- Arthritis
- Asthma
- Attention deficit disorder
- Autoimmune diseases (such as rheumatoid arthritis, lupus and multiple sclerosis)
- Cancer
- Depression
- Diabetes
- Eczema
- Elevated triglyceride levels
- Heart disease
- High blood pressure
- Inflammatory conditions (such as ulcerative colitis and Crohn's disease)
- Macular degeneration
- Menopause
- Osteoporosis

Pregnancy

- Psoriasis

### **Practical recommendations**

One of the major advances in nutritional medicine is the ability to produce a fish oil supplement that is a highly concentrated form of long-chain omega-3 fatty acids and also free from lipid peroxides, heavy metals, environmental contaminants and other harmful compounds. These “pharmaceutical grade” fish oil concentrates are so superior to earlier fish oil products that they are literally revolutionizing nutritional medicine because of the health benefits they produce.

For general health, the recommended dosage is 1,000 mg of EPA+DHA daily—not 1,000 mg of fish oil or algae. For therapeutic purposes such as reducing inflammation and allergies or lowering triglyceride levels, the dosage recommendation is usually 3,000 mg EPA+DHA daily.