

# Omega-3s, Communication and Hormones, Oh My!

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Communication between people is incredibly important. Whether it's verbal, body language, an email, or written letter, messages must be clearly delivered and received, otherwise misinterpretation is highly likely. Clear communication is just as important within the human body and hormone signaling is tremendously important in this regard. Healthy hormone production, metabolism, and response to signaling is absolutely necessary to live life to the fullest. Hormones are everywhere throughout the body and carry unbelievable power to impact health. Hormones have an effect on male and female sexual health, the thyroid, signals from the pituitary gland, blood sugar metabolism, the stress response, hunger, satiety, and many other essential functions.

The magic of hormones is in their capacity to relay signals to tissues throughout the body. When signals are clearly received, the proper response occurs, but when something disrupts the signaling pathway, problems occur quickly. An example with similar effects is the childhood game of telephone in which a message is whispered down a line of kids. By the last one, the message is so different from the original that all of the kids are laughing. However, missed messages are no laughing matter in the human body.

Signals must pass through the cell membranes of the 60+ trillion cells in the human body, each of which is composed of a phospholipid bilayer. A principal component of the membrane is fatty acids and the specific composition of the fatty acids is of the utmost importance for signaling. With too much saturated fat, the membrane loses its natural fluidity and signals cannot be effectively communicated to the inside of the cell. Poly-unsaturated fatty acids — both omega-3 and omega 6 — are a necessary component of the cell membrane in order to retain proper structure, and proper signal transduction pathways.

In countries that have a predominately western diet, the ratio of dietary omega-6 fatty acids dramatically outweighs the intake of omega-3 fatty acids, with some estimating this to be as high as 17:1. The appropriate ratio should be somewhere between 4:1 and 1:1. When it's not, a relative deficiency occurs. While this deficiency can affect many biochemical and biological processes in the body, there is a direct effect on the quality and integrity of the membranes of each of the 60+ trillion cells in the human body. This can impair the body's ability to effectively pass the hormonal signal to the inside of the cell.

The correction of imbalanced omega fatty acid intake must be a cornerstone of supporting healthy cell membranes, with the clinical approach addressing both sides of dietary intake. This should focus on significant reduction of omega-6 fatty acids, as well as increased intake of omega-3s EPA and DHA through food sources and supplementation. The Mediterranean Diet is a great option to achieve this goal. This well-known diet reduces many of the foods that pack the western diet full of AA (from omega-6). The incorporation of cold-water fish is an excellent way to increase the dietary quantity of both EPA and DHA. Keep in mind that one common misperception of how to acquire adequate levels of EPA and DHA is to use plant-based omega-3 sources of alpha-linolenic acid such

as flax or chia. While this will provide omega-3 fatty acids in the diet, it is important to realize that the efficiency of converting alpha-linolenic acid to EPA/DHA is very poor — between just 1% to 5%.

After dietary modification, supplementation with omega-3 fish oil products is the best way to achieve clinically relevant levels of EPA and DHA in the cell membrane. Specifically, a concentrated triglyceride-based formula has been shown to incorporate within cell membranes better than other commonly available fish oil options, including ethyl ester omega-3 products, krill oil, and salmon oil.<sup>1</sup> Dosing recommendations found in the literature vary from 1 to 7 grams of EPA+DHA daily, but a quick PubMed search of existing research using the keyword "fish oil" and the specific health concern will provide plentiful condition-specific dosing information. For general health, it's best to follow the recommendations that the manufacturer provides on the product label.

In certain situations, additional information may help you choose the most appropriate dose. For example, the fatty acid content within the membranes of red blood cells can be accessed by testing whole blood, or with a simple blood spot analysis known as the Holman Omega-3 Test. Test results will provide the information necessary to determine the most appropriate dosing for a patient at that moment. If using lab testing, it is important to retest after the chosen intervention in order to ensure that the treatment worked and to know how dosing should be adjusted in order to maintain the changes that took place.

The outside influences of the modern world can have a significant impact on the health of the cell membrane, and can compromise the ability of the body to use hormones to effectively signal tissues throughout the body. Through the clinical use of EPA and DHA supplementation, patients can reap the rewards of a healthy body that effectively communicates signals through the release of hormones.

*Reference:*

1. Laidlaw, M., Cockerline, C., & Rowe, W. (2014). Comparative bioavailability of omega-3 fatty acids from four different omega-3 supplements (272.6). *FASEB J*, 28(1\_Supplement), 272.6-. Retrieved from [www.fasebj.org/content/28/1\\_Supplement/272.6.short](http://www.fasebj.org/content/28/1_Supplement/272.6.short).

JANUARY 2016