MedicalXpress

Scientists show how DHA resolves inflammation

July 1 2013

Chronic inflammation is a major factor in a wide range of problems from arthritis to cardiovascular disease, and DHA (found in fish oil) is known to temper this problem. A new research report appearing in the July 2013 issue of *The FASEB Journal*, helps explain why DHA is important in reducing inflammation, and provides an important lead to finding new drugs that will help bring people back to optimal health. Specifically, researchers found that macrophages (a type of white blood cell) use DHA to produce "maresins," which serve as the "switch" that turns inflammation off and switches on resolution.

"We hope that the results from this study will enable investigators to test the relevance of the maresin pathway in human disease," said Charles N. Serhan, Ph.D., a researcher involved in the work from the Brigham & Women's Hospital and Harvard Medical School in Boston, Mass. "Moreover, we hope to better understand resolution biology and its potential pharmacology so that we can enhance our ability to control unwanted inflammation and improve the quality of life."

To make this discovery, Serhan and colleagues deconstructed the biosynthetic pathway for maresin biosynthesis and found that human macrophages are responsible for converting DHA to the novel epoxide intermediate "13S, 14S-epoxy-maresin." Then, they learned how to synthesize the molecule and found that maresins caused macrophages to change their "type" so they no longer caused inflammation (switching them from M1 to M2 phenotypes).

"We've known for a long time that DHA tames inflammation, now, we learn exactly how DHA works: via new substances called maresins," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "We encounter inflammation almost daily, but our body has ways of turning it off. This is an important step toward understanding exactly this happens. You're likely to be hearing a lot more about maresins if, or when, new therapies arise from this discovery."

More information: Jesmond Dalli, Min Zhu, Nikita A. Vlasenko, Bin Deng, Jesper Z. Haeggström, Nicos A. Petasis, and Charles N. Serhan. The novel 13S,14S-epoxy-maresin is converted by human macrophages to maresin 1 (MaR1), inhibits leukotriene A4 hydrolase (LTA4H), and shifts macrophage phenotype. *FASEB J* July 2013 27:2573-2583; doi:10.1096/fj.13-227728 ; www.fasebj.org/content/27/7/2573.abstract