

## **FADS gene cluster polymorphisms: Important modulators of fatty acid levels and their impact on atopic diseases**

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Long-chain polyunsaturated fatty acids (LC-PUFAs) play an important role in several physiological processes and their concentration in phospholipids has been associated with several complex diseases such as atopic disease. The level and composition of LC-PUFAs in the human body is highly dependent on their dietary intake or on the intake of fatty acid precursors, which are endogenously elongated and desaturated to physiologically active LC-PUFAs. The most important enzymes in this reaction cascade are the delta-5 and delta-6 desaturase. Several studies in the last few years have revealed that single nucleotide polymorphisms (SNPs) in the two desaturase encoding genes (*FADS1* and *FADS2*) are highly associated with the concentration of omega-6 and omega-3 fatty acids, showing that beside nutrition, genetic factors play an important role in the regulation of LC-PUFAs as well. This review focuses on current knowledge of the impact of genetic polymorphisms on LC-PUFA metabolism and on their potential role in the development of atopic diseases.

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