n-3 polyunsaturated fatty acids--physiological relevance of dose.

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Abstract

n-3 polyunsaturated fatty acids (PUFA) are widely used for chemotheraphy/chemoprevention of chronic diseases. However, the molecular mechanism(s) by which the bioactive n-3 PUFA (eicosapentaenoic acid and docosahexaenoic acid) modulate effector pathways are not fully elucidated. Multiple experimental approaches, including use of animal models, cell lines, and human clinical trials, have been utilized to dissect the complex effectors. It is imperative to link these different experimental approaches together in order to interpret outcomes in the context of human physiology and pathophysiology. Unfortunately, the adoption of a broad array of model systems and a wide range of fatty acid exposures (i.e. doses) has made it difficult to interpret biological outcomes. Therefore, in this mini-review we discuss the impact of (a) molecular structure of bioactive fatty acids, (b) dose relevance relative to human consumption, (c) enrichment of fatty acids in sera and tissues following dietary intake, and (d) limitations of cell/tissue culture studies.