

Research Project Proposal
Academic year 2015-2016

Project Nº 41
Title: Transcriptional regulation of adipose tissue metabolism in obesity, inflammation and insulin resistance: effects of omega-3 and derived specialized proresolving lipid mediators
Department/ Laboratory Department of Nutrition, Food Sciences and Physiology / Nutrition Research Center. School of Pharmacy
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Summary <p>Obesity is a serious and growing public health problem. The low-grade chronic inflammation associated with obesity contributes to the development of the metabolic disorders linked to obesity, such as insulin resistance, cardiovascular diseases and metabolic syndrome. Several studies and clinical investigations have suggested the potential beneficial effects of consumption / supplementation with omega-3 fatty acids of marine origin (EPA and DHA) in these pathologies. It has been proposed that these beneficial actions of omega-3 may in part result from its ability to reduce inflammation in adipose tissue and to modulate its metabolism and secretory function. The project will focus in studying the potential beneficial actions of specialized proresolving lipid mediators (resolvins and maresins), endogenous lipid derivatives of omega-3, in obesity and associated metabolic complications. The cellular and molecular mechanisms involved will be studied in cultured adipocytes, mainly focusing on the study of: 1) their actions on the regulation of lipogenesis, lipolysis, autophagy, and the factors that promote brown phenotype in white adipose tissue; 2) the secretion of some adipokines with a key role in regulating insulin sensitivity and glucose and lipid metabolism.</p> <p>1: Spite M, Clària J, Serhan CN. Resolvins, specialized proresolving lipid mediators, and their potential roles in metabolic diseases. <i>Cell Metab.</i> 2014;19(1):21-36.</p> <p>2: Clària J, Nguyen BT, Madenci AL, Ozaki CK, Serhan CN. Diversity of lipid mediators in human adipose tissue depots. <i>Am J Physiol Cell Physiol.</i> 2013;304(12):C1141-9.</p>



3: Neuhofer A, Zeyda M, Mascher D, Itariu BK, Murano I, Leitner L, Hochbrugger EE, Fraisl P, Cinti S, Serhan CN, Stulnig TM. Impaired local production of proresolving lipid mediators in obesity and 17-HDHA as a potential treatment for obesity-associated inflammation. *Diabetes*. 2013;62(6):1945-56.

POSSIBILITY OF PhD

YES *

* (PhD grant required)