

Research Project Proposal
Academic year 2016-2017

Project Nº 45
Title: Effects of an omega-3 derived proresolving lipid mediator on gut microbiota composition and its association with intestinal inflammation and insulin sensitivity in an animal model of obesity.
Department/ Laboratory DEPARTMENT OF NUTRITION, FOOD SCIENCES AND PHYSIOLOGY UNIVERSITY OF NAVARRA
Director: Dra. María Jesús Moreno Aliaga Contact: mjmoreno@unav.es Codirector: Dra. María Pilar Lostao Crespo Contact: plostao@unav.es
Summary Obesity is associated with the development of metabolic diseases including type 2 diabetes and immune disorders, including a worse prognosis of inflammatory bowel disease. Differential composition of gut microbiota has been identified between lean and obese subjects. Interestingly, it has been proposed that a crosstalk between intestinal microbiota, adipose tissue and skeletal muscle is an early event in systemic low-grade inflammation and in the development of obesity and diabetes. Previous studies have suggested that modification of gut microbiota may be a relevant therapeutic avenue for obesity and other metabolic disorders. Resolvins, protectins and maresins are newly identified omega-3 derived lipid mediators biosynthesized within the resolution phase of inflammation. The administration of some of these specialized pro-resolving lipid mediators (SPM) to obese mice improved adipose inflammation and obesity-associated complications. These SPMs can also reduce intestinal inflammation in animal models of colitis. However, there is not information available about if these SPMs could modulate gut microbiota profile and the potential relationship with their metabolic effects in obesity. Therefore, the aim of the present project is to study the effect of an omega-3 derived SPM on gut microbiota composition and its association with intestinal inflammation and insulin sensitivity in animal model of obesity. Gut microbiota profiling will be carried out in fresh faecal samples from the different experimental groups by high-throughput 16S rDNA amplicon sequencing. Reads will be clustered using the MIRA assembler, contigs and singletons will be blasted against RDP database. Blast results will be provided to MEGAN for taxonomic classification.

References

Spite M, Clària J, Serhan CN. Resolvins, specialized proresolving lipid mediators, and their potential roles in metabolic diseases. *Cell Metab.* 2014 7;19(1):21-36.

Marcon R, Bento AF, Dutra RC, Bicca MA, Leite DF, Calixto JB. Maresin 1, a proresolving lipid mediator derived from omega-3 polyunsaturated fatty acids, exerts protective actions in murine models of colitis. *J Immunol.* 2013;191(8):4288-98.

Cox AJ, West NP, Cripps AW. Obesity, inflammation, and the gut microbiota. *Lancet Diabetes Endocrinol.* 2015;3(3):207-15.

POSSIBILITY OF PhD

YES*

* (PhD grant required)