Molecular metabolic response of diet-induced obese mice to a polyphenol mixture beverage based on Mediterranean Diet consumption

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Background and objectives:

FGF21 is considered a therapeutic target for the treatment of metabolic diseases due to its beneficial effects on glucose/lipid homeostasis, body weight and energy expenditure. Polyphenols regular consumption has been associated with beneficial effects on obesity and insulin resistance and some of them are able to modulate the FGF21 expression and/or signalling. Based on the metabolic effects of FGF21 and the healthy benefits of polyphenols we hypothesised that **FGF21 could link dietary polyphenols and metabolism**. Concretely, our **objective** is **to describe the molecular mechanisms through which polyphenols impacts on metabolism looking for the role of FGF21.**

Methodology:

We analysed the effects of a Polyphenol-supplemented beverage based on polyphenol consumption described on the PREDIMED study in diet-induced obese (DIO) mice. The nutritional intervention was introduced 4 weeks after the HFD, when the animals showed an impaired GTT and maintained for 12 weeks. We performed a molecular characterization of metabolism and FGF21 signalling in liver and subcutaneous white adipose (scWAT) tissue of the animals.

Results and conclusions:

Polyphenol-supplemented mice showed significant changes in the mRNA levels of Fatty acid synthase (FAS), SREBP1c and FGF21 receptor 1 (FGFR1) in liver and FGFR1 in scWAT. Obesity is described as an FGF21 resistant state and our results indicates that our polyphenols mixture can partially revert this phenotype by inducing the FGF21 receptors (FGFR1) and reducing the FGF21 expression in the liver but also have an effect on lipid metabolism by changing the lipogenesis capacity.

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