Molecular adaptations underlying the beneficial effects of hydroxytyrosol in the pathogenic alterations induced by a high-fat diet in mouse liver: PPAR-? and Nrf2 activation, and NF-?B down-regulation

Valenzuela, Rodrigo

Illesca, Paola

Echeverría, Francisca

Espinosa, Alejandra

Rincón-Cervera, Miguel Ángel

Ortiz, Macarena

Hernandez-Rodas, María Catalina

Valenzuela, Alfonso

Videla, Luis A.

Scope: Non-alcoholic fatty liver disease (NAFLD) is a condition characterized by an increment in the liver fat content, with a concomitant reduction in the content of n-3-long chain polyunsaturated fatty acids (n-3 LCPUFAs), downregulation of PPAR-? activity, and upregulation of NF-?B activity, effects that induce pro-lipogenic and pro-inflammatory responses. Hydroxytyrosol (HT), a polyphenol with cytoprotective effects present in extra virgin olive oil, improves the cellular antioxidant capacity for activation of transcription factor Nrf2. The objective of this work is to evaluate the molecular adaptations involved in the anti-lipogenic, anti-inflammatory, and anti-oxidant effects of HT supplementation in high-fat diet (HFD)-fed mice. Methods and results: Male C57BL/6J mice received (i) control diet (10% fat); (ii) control diet + HT (daily doses of 5 mg per kg body weight), (iii) HFD (60% fat); or (iv) HFD + HT for 12 weeks. HFD-fed mice exhibited