

ABSTRACT

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Title: Synthesis of lipophenolic derivatives of hydroxytyrosol, resveratrol and phloroglucinol

Lipophenols are conjugates of (poly)phenolic derivatives with a lipid moiety that are designed here to access lipophilic antioxidants.

First part of this work targets olive oil lipophenols. Three new lipophenolic compounds, conjugates of hydroxytyrosol (most abundant olive oil phenol derivative) and three different unsaturated fatty acids were synthesized in two steps, in good yield and high purity. These products will be used as standards for determination of their presence in extra virgin olive oil (EVOO) and in liver samples of rats being fed by EVOO to examine possible *in vivo* metabolization.

Second part of the work targets lipophenols as potential antioxidant and anti-carbonyl-stress agents in retinal diseases, where those factors are involved in the physiopathology. (Poly)phenols linkage to specific lipophilic FAs can increase their bioavailability, potentially enable vectorization to the target retina tissue and bring synergic effect of both moieties. Lipophenolic conjugates previously synthesized within the team showed promising results *in vitro* against oxidative and carbonyl stress. Two new conjugates of resveratrol were synthesized in five steps, in gram amounts. Products will be used for *in vitro* experiments to investigate the effect and the importance of the docosahexaenoic acid (DHA; C22:6, *n*-3) part in previously obtained lipophenols.

Finally, to increase antioxidant properties of phloroglucinol lipophenolic derivatives, a promising six-step pathway was tested to link the DHA and the alkyl-phloroglucinol moieties through a new kind of linker.