

## Protective Activity Of Olive Oil Polyphenols Metabolites

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The biological properties of VOO phenolic compounds in vivo will depend on the extent to which they are absorbed and metabolized. Bioavailability studies have demonstrated that hydroxytyrosol (HyTy) and its secoiridoid derivatives are absorbed. It was verified the two main metabolic pathways for HyTy are the O-glucuronide conjugation and the O-methylation, leading to the formation of homovanillyl alcohol (HVA) [1]. Secoiridoids seems to be reduced and conjugated with glucuronic acid [2]. Some studies propose that glucuronides function not only as detoxified metabolites but also as hydrophilic bioactive agents and precursors of aglycones. Accordantly, aglycones may be assumed to emerge in the target site by the action of  $\beta$ -glucuronidase activity under oxidative stress such as inflammation [3]. Therefore, the health benefits of VOO polyphenols may be attributed not only to phase II metabolites but also to phase I metabolites and parental compounds.

With the purpose to clarify the protective properties of phenols in human cells and identify molecular mechanisms responsible for anti-atherosclerotic effects, red blood cells (RBC) were chosen as a model for the study [4]. The capacity to protect RBC from AAPH-induced and H<sub>2</sub>O<sub>2</sub>-induced oxidative injury were studied for several metabolites, namely, HVA 4'-O-glucuronide, HyTy 3' and 4'-O-glucuronides and secoiridoids metabolites. All compounds, except the HVA glucuronide, showed to significantly protect RBCs from oxidative haemolysis and to prevent morphological RBC changes.

[1] Miró-Casas *et al*, *Clinical Chem*, 2003, 49, 945-952.

[2] J. Pinto *et al.*, *Brit J Nutr*, 2011, 105, 1607–1618.

[3] Menendez *et al*, *Mol. Nutr. Food Res*. 2011, 55, 1–11

[4] Paiva-Martins, *et al*, *Mol Nutr Food Res*, 2009, 53, 609-616.