

## ANTIOXIDANT ACTIVITY OF BIOACTIVE MOLECULES IN HOMOGENEOUS AND HETEROGENEOUS MEDIA

Chatzidaki M.D.<sup>1), 2)</sup>, Sotiroudīs G.<sup>1)</sup>, Zoumpantioti M.<sup>1)</sup>, Bourlieu-Lacanal C.<sup>2)</sup>, Villeneuve P.<sup>2)</sup>, Xenakis A. <sup>\*1)</sup>

<sup>1)</sup> Institute of Biology, Medicinal Chemistry and Biotechnology, National Hellenic Research Foundation, Athens, Greece

- [\\*arisx@eie.gr](mailto:*arisx@eie.gr)

<sup>2)</sup> UMR IATE, CIRAD, Montpellier, France

In recent decades there is an increasing interest from the food industry towards edible water-in-oil (W/O) systems that resemble the structure of plant oils [1], which can solubilize bioactive molecules of different polarity. In this context, carriers of antioxidants (AOs) that could possibly optimize their activity in different environments are particularly necessary [2]. The use of a W/O microemulsion as a carrier of AOs could be a solution.

In the present work, a microemulsion based on medium chain triglycerides [3, 4], was tested for its ability to dispose natural phenolic acids (p-hydroxybenzoic, protocatechuic and gallic), alcohols (tyrosol and hydroxytyrosol) and esters. Also isomers of hydroxyphenylacetic acid (HPA) propyl esters were synthesized using lipase from *Candida antarctica*. The reaction took place in surfactantless microemulsions and the synthesized esters were then measured for their antioxidant capacity. All AOs were tested using complementary tests in lipophilic (electron paramagnetic resonance spectroscopy- radical scavenging assay), heterogeneous (conjugated autoxidizable triene assay) or hydrophilic (oxygen radical absorbance capacity – fluorescein assay) environments.

It was found that the bioactives had a different behaviour when used at environment with different polarities probably due to the partition coefficient of acids and esters. Moreover, it was found that depending on the AO test, some bioactive molecules appeared to undergo enhanced scavenging properties compared to the others. This phenomenon is indicating the effect of a molecule's morphology on its AO properties.

Altogether, these experiments proposed an integrated approach of the physico-chemical and other parameters that modulate the AO activity in various environments that are encountered in food products or along the digestive tract.

**References:** [1] Xenakis A, Papadimitriou V, Sotiroudīs TG., (2010). *Curr. Opin. Colloid Interface Sci.*, 15(1):55-60, [2] Laguerre, M. et al., (2015). *Crit. Rev. Food Sci. Nutr.*, 55(2):183-201, [3] Chatzidaki M. D. et al., (2016). *Colloids Surf. B.*, 137:146-151, [4] Chatzidaki M. D. et al., (2016). *Foodfunct.*, 7:2258-2269.