

## Virgin oil polyphenols prevent UVB-induced keratinocyte cell death

Sara Salucci<sup>1</sup>, Sabrina Burattini<sup>1</sup>, Davide Curzi<sup>1</sup>, Francesco M. Giordano<sup>1</sup>, Francesca Buontempo<sup>2</sup>, Alberto M. Martelli<sup>2</sup>, Elisabetta Falcieri<sup>1,3</sup>, Michela Battistelli<sup>1</sup>

<sup>1</sup> DiSTeVA, University of Urbino Carlo Bo, Urbino, 61029, Italy

<sup>2</sup> Department of Biomedical and Neuromotor Sciences; University of Bologna; Bologna, Italy

<sup>3</sup> IGM, CNR, Rizzoli Orthopaedic Institute, Bologna, 40136, Italy

Food compounds, in particular hydroxytyrosol (HyT), hydroxytyrosol laurate (L-HyT) and tyrosol (Tyr), polyphenols present in virgin oil, have attracted much interest because of their potential use in new preventive, protective, and therapeutic strategies for chronic skin degenerative disorders, including erythema, inflammation and aging (Lahtz et al., 2013). In our previous studies HyT and L-HyT anti-apoptotic effects, against pro-oxidant agents in different cell models, have been demonstrated (Burattini et al., 2013). Here, the potential protective actions of antioxidant compounds against UV-induced apoptosis were investigated in human keratinocytes (HaCaT). The cell line was pre-treated with antioxidants before UVB exposure and their effect evaluated by means of ultrastructural and molecular analyses. After UVB radiation typical morphological apoptotic features appeared and their significant down regulation could be observed when polyphenols were administrated before cell death induction. These data have been confirmed by molecular analyses. In fact, both intrinsic and extrinsic apoptotic pathways appeared activated after UVB radiation. When antioxidants were added to samples before cell death induction, an evident caspase activation decrease could be revealed. In conclusion, these results demonstrate that polyphenols are able to prevent *in vitro* apoptotic cell death in human keratinocytes exposed to UVB, encouraging their use *in vivo* as potential sun damage-preventing molecules.

### References

- [1] Burattini et al. (2013) Anti-apoptotic activity of hydroxytyrosol and hydroxytyrosyl laurate. *Food Chem Toxicol* 55: 248-56.
- [2] Lahtz et al. (2013) UVB irradiation does not directly induce detectable changes of DNA methylation in human keratinocytes. *F1000Res* 13: 2:45.

### Keywords

HaCaT, UVB, antioxidants, apoptosis, polyphenols.