

BOOK OF ABSTRACTS

REDOX SIGNALING AND OXIDATIVE STRESS IN HEALTH AND DISEASE

International
Symposium

IV SPANISH AND PORTUGUESE
MEETING ON FREE RADICALS

VALENCIA 5-7th JUNE 2012
PALACIO DE CONGRESOS DE VALENCIA



S5.P06

Elicitation of *Hypericum perforatum* cells with *Agrobacterium tumefaciens* induces production of bioactive phytochemicals that afford protection against oxidative stress induced in human HepG2 cells

Carvalho A.C., Franklin G., Dias A.C.P., Lima C.F.

CITAB - University of Minho. CITAB-UM. Department of Biology. Portugal

Abstract:

Hypericum perforatum (HP) commonly known as St. John's wort is an important medicinal plant traditionally used in several ailments including mild to moderate depression. In a recent study, elicitation of HP cells (culture of cells in suspension) with *Agrobacterium tumefaciens* (AT) increased significantly the production of compounds with antioxidant and antimicrobial properties [1]. The ability of methanolic extracts of elicited and control HP cells to protect human hepatocytes (HepG2 cell line) against oxidative stress were here investigated. When HepG2 cells were co-incubated with HP extracts (80mg/ml) and 800mM *tert*-butyl hydroperoxide (*tert*-BOOH), only the HP extract from elicited cells significantly protected against cell death and DNA damage, as measured by the MTT and comet assay, respectively. The same was observed when the extracts were pre-incubated for 5h with HP extracts, followed by a period of 16 h of recovery with fresh medium, prior to incubation with *tert*-BOOH. This suggested the ability of HP extract from elicited cells to induce intracellular antioxidant defenses in HepG2 cells. That was confirmed by the induction of about 40% in the content of glutathione in HepG2 cells, whereas control extract increased only 10%. As well, only the extract from elicited HP cells was able to induce the levels of cytoprotective enzymes such as HO-1 and NQO1. In conclusion, we observed that elicitation of HP cells with AT produced bioactive compounds present in the methanolic extract able to protect HepG2 cells against oxidative stress, and also to induce intracellular antioxidant defenses of this human cell line.

Acknowledgements: ACC is supported by B11-PTDC/QUI-BIQ/101392/2008 grant. This work is supported by FCT research grants NaturAge-PTDC/QUI-BIQ/101392/2008 and HyperFood-PTDC/AGR-ALI/105169/2008, co-funded by the program COMPETE from QREN with co-participation from the European Community fund FEDER.

[1] Franklin *et al.*, *Phytochemistry*, 2009, 70: 60-8.