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Poster Abstract – A.03

VITAMIN E BIOSYNTHESIS CAN BE MODULATED BY JASMONIC ACID IN PLANT CELL CULTURES

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Tocopherols (better known as vitamin E) are lipophilic antioxidants, which are important in human health. They are exclusively synthesised by photosynthetic organisms. Recently, with the aim of improving human nutrition, biotechnological approaches to manipulate vitamin E content in plants have been a major focus of research. The biochemical steps of the tocopherol biosynthetic pathway have been elucidated in various plant species and, in the last few years, all the genes necessary to produce tocopherols have been identified in *Arabidopsis thaliana*. Nevertheless, the regulation of tocopherol biosynthesis in plants is far from being fully understood.

Suspension cell cultures of *Helianthus annuus* L. were previously established for the production of the most active component of vitamin E, α-tocopherol, by optimising medium composition and culture conditions. In order to better understand the regulation of tocopherol production in plant cell cultures, the possibility of enhancing a-tocopherol production by the addition of jasmonic acid to the culture medium was investigated both in sunflower and *Arabidopsis thaliana* cell cultures. A considerable increase (49% and 66%, respectively) of α-tocopherol production was obtained in both, after a 72 hour treatment with 5 µM jasmonic acid. In these conditions, semiquantitative RT-PCR indicated that *p*-hydroxyphenyl pyruvate dioxygenase (HPPD) and homogentisate phytyltransferase (HPT) gene expression was enhanced compared to the Actin gene.The modulation of α-tocopherol levels in plant cell cultures can provide useful hints for a regulatory impact on vitamin E metabolism.