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Oral Communication Abstract – 3.03

THE RIPENING INITIATION OF APPLE FRUIT IS REGULATED BY A HORMONAL CIRCUIT SUSTAINED BY AUXIN.

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The wide array of changes occurring during the ripening process of fleshy fruits can be considered as a series of events genetically determined and finely tuned by the action of a complex hormonal interplay. In climacteric fruit, such as apple, the effect of ethylene has been traditionally accounted for the ripening progression, albeit auxin, originally known as an ethylene antagonist, is now considered as an active player in the initiation of the maturation phase. To investigate the complex synergistic regulation occurring between these hormones we profiled the ethylene production and auxin accumulation in three apple cultivars that exhibit different ripening behaviour, during the post-harvest stage and after treatment with 1-methylcyclopropene (1-MCP), an ethylene competitor. These data were correlated with the whole transcriptome analysed by RNA-seq, dissecting the effect of the interference acted by 1-MCP on the ethylene perception machinery. Interestingly, the ripening blockage induced an initial accumulation of auxin, highlighting the connection existing between these two hormones. This phenomenon was further supported by the functional annotation of the differentially expressed genes, using the KEGG database and confirmed by a candidate-gene based expression analysis that revealed an antagonistic activation of *GH3* and *ILL* genes, encoding key steps in the regulation of the auxin homeostasis.

The data we provided underline the auxin attribute to mediate the ripening initiation, through a *de-novo* synthesis and de-conjugation of auxin as a

tentative to restore the normal ripening physiology, when ethylene metabolism is compromised at the onset of the climacteric ripening.