**New physiological and molecular insights on ripening biology of avocado**

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‘Hass’ avocado fruit (*Persea americana* Mill.) have the remarkable ability to remain attached to the tree in a horticulturally mature state (i.e. with the ability to ripen), but remain unripe for over one year. However, once detached, the fruit will ripen (soften) fully in ambient conditions, albeit variably, over a 1- to 2-week period, controlled in part by the timing of ethylene production. To obtain an holistic understanding of the regulation responsible for this ripening biology, we have carried out a range of pharmacological, physiological and molecular experiments. Treatment with the plant hormones indole acetic acid, abscisic acid, thidiazuron, and gibberellic acid at different concentrations had little effect on ripening timing; however, as expected, ethephon and ethylene treatments both accelerated and synchronized the ripening of the fruit. We performed RNAseq on ethylene- and ethephon-treated fruit during ripening, as a start to identifying the key genes responsible for turning on ethylene production and executing the ethylene-based ripening/softening response. We present how our findings advance current knowledge on avocado ripening and how this knowledge may be useful for improvement of other crops.

**Key words**:  hormones, transient expression, RNAseq