

**Title** Apple ethylene receptor protein concentrations are affected by ethylene, and differ in cultivars that have different storage life

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### Abstract

Ethylene plays a crucial role in apple fruit ripening. Ethylene receptors have been identified and are known to be negative regulators of ethylene signalling. We examined ethylene receptors MdERS1 and MdERS2 in 1-MCP-treated and untreated fruit and leaves of *cultivar* 'Orin' and 'Fuji' apples. *MdERS1* and *MdERS2* transcription increased rapidly after harvest in control fruit, but in 1-MCP-treated fruit, increases were delayed for 30 days. However, MdERS1 and MdERS2 protein levels behaved differently. MdERS1 decreased gradually in both the control and 1-MCP treatments. MdERS2, however, increased gradually in control 'Fuji' and remained steady in 1-MCP-treated 'Fuji' but remained low in 'Orin'. Exogenous ethylene treatment of fruit increased *MdERS1* and *MdERS2* expression with slightly decreased protein levels. The ratios of proteins to mRNAs were much lower in 'Orin' fruit, and they decreased with ethylene treatment in both cultivars. However, protein to transcript ratio was higher in 'Fuji' ethylene treated fruit than in air- and ethylene-treated 'Orin' fruit. *MdERS1* and *MdERS2* transcript levels were increased by exogenous ethylene treatment in air pre-treated leaves, but MdERS1 and MdERS2 protein levels did not change or decrease with ethylene treatment, and the ratio of protein to mRNA was lower in ethylene-treated leaves. Differences between transcription and protein levels may be due to receptor turnover differences in the presence or absence of ethylene. Furthermore, MdERS1 and MdERS2 protein stabilities in the presence of ethylene were different in the two *cvs.* 'Orin' and 'Fuji'.

<http://www.springerlink.com/content/p230106107060510/fulltext.pdf>