

Title Relationship between *Rh-RTH1* and ethylene receptor gene expression in response to ethylene in cut rose

Author Yixun Yu, Jing Wang, Huinan Wang, Zhaoqi Zhang and Juanxu Liu

Citation Plant Cell Reports, 29, Number 8, 895-904, 2010

Keywords Cut rose; RTE1; RTH; Ethylene receptor; Gene expression; *Rosa hybrida*

Abstract

A cDNA clone encoding a putative RTE1-like protein (Rh-RTH1) was obtained from total RNA isolated from senescing rose (*Rosa hybrida* cv. Tineke) petals using RT-PCR and RACE techniques. The cDNA (1,061 bp) contained an open reading frame of 684 bp corresponding to 227 amino acids. The amino acid sequence had 60.0, 49.6, 61.2, 42.5 and 39.8% identity with that of Arabidopsis RTH, RTE1, tomato GRL2, GRL1 and GR, respectively. Northern hybridization indicated that *Rh-RTH1* expression is enhanced by endogenous and exogenous ethylene and inhibited by 1-MCP in petals and gynoecia. *Rh-RTH1* expression partly correlated with sites of the ethylene receptor gene *Rh-ETR1* and *Rh-ETR3* expression, such as the petals, gynoecia, roots, and buds. The induction of *Rh-RTH1* and *Rh-ETR3* expression was substantially suppressed by 1-MCP treatment, while *Rh-ETR1* expression was not reduced by 1-MCP treatment. Following treatment of flowers with sucrose, the level of *Rh-RTH1* and *Rh-ETR3* mRNA was only slightly decreased in petals and gynoecia. Upon wounding treatment, *Rh-RTH1*, *Rh-ETR1* and *Rh-ETR3* showed a quick increase in mRNA accumulation which was positively correlated with the increase in ethylene production. The expression of *Rh-RTH1* showed partial correlation with that of *Rh-ETR1* and *Rh-ETR3*.

<http://www.springerlink.com/content/775p88206328732n/fulltext.pdf>