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葡萄SA 和JA 信号转导重要基因克隆及其对外源信号应答分析

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Cloning of Several Important Genes Involved in Grapevine SA and JA Signaling Pathways and Their Response to Exogenous Signals

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摘要 以‘藤稔’葡萄（*Vitis vinifera* × *V. labrusca*‘Fujiminori’）的叶片为试材，克隆了水杨酸（SA）和茉莉酸（JA）信号转导途径中重要基因*NPR1*、*PR1*、*COI1*和*LOX2*，利用定量和半定量PCR法研究其在SA与JA处理后的表达情况，发现*PR1*特异地受到SA诱导，而施加JA后抑制其表达；*LOX2*特异地受到JA的诱导，SA处理抑制其表达。上、下游基因的表达情况说明，*PR1*和*LOX2*可作为葡萄SA和JA信号转导途径的标记基因，同时研究发现葡萄中*NPR1*、*PR1*、*COI1*和*LOX2*表达量的快速上升出现在SA和JA处理后6 ~ 24 h；SA与JA信号转导途径存在着协同或拮抗作用，它们之间的相对浓度决定着这种相互关系的变化。

关键词： 葡萄 水杨酸 茉莉酸 克隆 表达

Abstract： To understand gene response to exogenous signals in SA and JA signal transduction pathways of grapevine and analysis of the cross-interaction between these two pathways，this study cloned the genes of *NPR1*，*PR1*，*COI1* and *LOX2* from grapevine ‘Fujiminori’（*Vitis vinifera* × *Vitis labrusca*）. The identity analysis of them with their homologous genes in different plants indicated that the related genes in SA and JA signaling pathways were conserved at relatively high level. Quantitative and semi-quantitative PCR were employed to analyze the expression of the four genes at different levels of hormone treatment，and the results showed that *PR1* was specifically induced by the SA，and inhibited after JA applied；SA inhibited expression of *LOX2*（a gene specifically induced by JA）. According to expression of the two pairs of upstream and downstream genes belonging to SA and JA signalingpathways，the genes *PR1* and *LOX2* could be considered as the marker genes of these two signal transduction pathways in grapevine. The expression levels of *NPR1*，*PR1*，*COI1* and *LOX2* increased rapidly during the 6－24 h after treatment，and the antagonistic effect between SA and JA pathways may also exist in grapevine.The interactions between SA and JA pathways could be affected by the relative concentration of each hormone.

Keywords： grapevine， SA， JA， clone， expression analysis

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