ABA stimulates wound suberization through antagonizing the MYB4-mediated transcriptional repression of *CYP86A1* and *FAR* in postharvest kiwifruit

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Postharvest Biology and Technology, Volume 172, February 2021, 111354

Abstract

Suberin biosynthesis involves a large number of genes, and many of them are induced by abscisic acid (ABA). However, the regulation of transcription factor (TF) in response to ABA on suberin biosynthetic genes in kiwifruit has been unexplored. In this study, two genes, *AchnCYP86A1* and *AchnFAR* respectively encoding a fatty acid **ω**-hydroxylase and fatty acyl-CoA reductase involved in suberin monomer biosynthesis were demonstrated in transient overexpressed tobacco (*Nicotiana benthamiana*). Notably, the negative regulation of AchnMYB4 on *AchnCYP86A1* and *AchnFAR* was identified. AchnMYB4 could repress *AchnCYP86A1* and *AchnFAR* transcript by directly binding to the gene promoter in yeast one-hybrid and dual-luciferase assays. These results were further confirmed in transient overexpressed tobacco leaves in that *AchnMYB4* significantly down-regulated suberin biosynthetic genes including *CYP86A1*, *FAR2* and *FAR3*, and reduced accumulation of **ω**-hydroxyacids and primary alcohols. Moreover, exogenous ABA could induce the expression of *AchnCYP86A1* and *AchnFAR*, and the accumulation of corresponding suberin monomers by inhibition of *AchnMYB4* in wound-tissue of kiwifruit. However, fluridone (an inhibitor of ABA biosynthesis) was found to counter the inductive effects of ABA. Taken together, the results suggest that ABA activates *AchnCYP86A1* and *AchnFAR* to promote suberin monomers biosynthesis by inhibiting *AchnMYB4*.