

ABA and its signaling pathway are involved in the cold acclimation and deacclimation of grapevine buds

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The grapevine (*Vitis vinifera* L.) buds as well as the buds of other deciduous fruit trees acclimate and deacclimate to the cold during the autumn-winter season. Cold acclimation (CA) is characterized by an increase in bud cold-hardiness, while deacclimation (DA) by a loss of it. The mechanisms underlying the transition of the buds from CA to DA are not well understood. In this study, the effect of ABA, LT and ABA + LT on the expression of the genes of the ABA signaling pathway, and the role that these genes and ABA play in the transition of the buds from the CA to the DA was investigated. In vitro experiments carried-out with single-bud cuttings were used to analyze the effect of ABA, LT and ABA + LT treatments on the expression of ABA signaling genes. To study the role of ABA and its signaling pathway in the transition of grapevine buds from CA to DA, applications of ABA and Uniconazole-P (Uni-P), an inhibitor of the enzyme that catabolizes ABA, were performed to the grapevine buds during their period of CA and DA. The results show that: a) VvPP2Cs were the only ABA signaling genes which were induced synergistically by ABA + LT, b) ABA improved the cold-hardiness of the buds only during its period of CA c) Uni-P advanced the appearance of the second peak of ABA in the buds and its transition from the CA to the DA.