Biotic Stress-Induced Priming and De-Priming of Transcriptional Memory in Arabidopsis and Apple

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Résumé en anglais	Under natural growth conditions, plants experience various and repetitive biotic and abiotic stresses. Salicylic acid (SA) is a key phytohormone involved in the response to biotic challenges. Application of synthetic SA analogues can efficiently prime defense responses, and leads to improved pathogen resistance. Because SA analogues can result in long-term priming and memory, we identified genes for which expression was affected by the SA analogue and explored the role of DNA methylation in this memorization process. We show that treatments with an SA analogue can lead to long-term transcriptional memory of particular genes in Arabidopsis. We found that subsequent challenging of such plants with a bacterial elicitor reverted this transcriptional memory, bringing their expression back to the original pre-treatment level. We also made very similar observations in apple (Malus domestica), suggesting that this expression pattern is highly conserved in plants. Finally, we found a potential role for DNA methylation in the observed transcriptional memory behavior. We show that plants defective in DNA methylation pathways displayed a different memory behavior. Our work improves our understanding of the role of transcriptional memory in priming, and has important implication concerning the application of SA analogues in agricultural settings.
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