Potential candidates for plant proteins interacting with bacterial quorum sensing (QS) molecules

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During the cultivation of crop plants, priming for enhanced resistance using biocontrol agents is an efficient disease management strategy. It results in robust resistance and higher yield. The beneficial affects of the bacterial QS molecules, e.g. *N*-acyl homoserine lactones (AHLs), on resistance and plant growth has been shown in different crop plants. Similarly, the model plant *Arabidopsis,* if pre-treated with the AHL oxo-C14-HSL was more resistant to *Pseudomonas syringae* pv. *tomato* 3000. Oxo-C14-HSL primed plants exhibited stronger activation of MAP kinases AtMPK3 and AtMPK6, followed by higher expression of defence-associated transcription factors *WRKY22* and *WRKY29* along with the *PR1* gene.

So far, AHLs of different lengths of their lipid moiety ranging from 6 to 14 carbons and substitution with oxo or hydroxyl groups in the γ position have been identified. These modifications of the molecular structure of AHLs have impact on the resulting influence on plants, contributing either to resistance induction (longer lipid chains) or growth promotion (short-chained AHLs). Upon AHL perception, the transcriptional reprogramming of various defence and growth related genes modifies the physiology of primed plants. In bacteria, AHLs are perceived through their cognate receptors, often from the LuxR-type family. In animals, the Peroxisome Proliferator-Activated Receptors PPARγ and PPARβ, members of the nuclear hormone receptor (NHR) family, and the ras GTPase-activating-like protein IQGAP1 were proposed as potential candidates for AHLs receptors. Although AHLs induce modifications in development and changes in gene expression, AHL interacting proteins in plants are not yet reported. However, in order to elucidate the precise impact of AHLs on plant defence responses, identification and characterization of AHL perception mechanism(s) is essential.

In this study, we present a search for the AHL-interacting proteins in *Arabidopsis thaliana*, and demonstrate the difference in expression of defence-related genes in oxo-C14-HSL-primed wild type plants and two mutants in potential candidate genes.