

Expression of *Arabidopsis* resistant genes under abiotic stress conditions

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Abstract

The plant immune system is equipped with several defensive layers to evade pathogen attack. One of the primary defense includes plasma membrane-localized receptors explicitly detect conserved pathogen-associated molecular patterns (PAMPs). Transcriptional reprogramming of resistant genes confers PAMP-triggered immunity (PTI). Consequently basal immunity is triggered which is primarily mediated by several intracellular nucleotide-binding leucine rich repeat (NLR) receptors. Subsequently, NLRs sense pathogens and activates another defense response known as effector triggered immunity (ETI). Both the PTI and ETI are mediated by resistant genes. Interestingly, the detailed molecular function of resistant genes is not yet fully revealed. Resistant genes are also well involved in non pathophysiological conditions such as during cold stress, heat stress, duration of exposure of light and drought stress. Here, we have reported that the *Arabidopsis* resistant genes *AT1G17600*, *AT4G14368*, *AT4G16860*, *AT5G40910* and *AT5G45050* are temperature regulated. We found that the transcript levels of *AT1G58400*, *AT2G14080*, *AT2G17055*, *AT3G51560*, *AT4G16950*, *AT5G40910* and *AT5G45050* were significantly raised for the plant samples grown under short-day conditions. The transcript levels of *AT1G17600*, *AT1G27180*, *AT1G33560*, *AT2G14080*, *AT3G51560*, *AT4G16860* and *AT4G16950* were upregulated for plants grown under drought stress conditions. In *Arabidopsis* the transcriptional reprogramming is modulated by decapping protein factors. There was no significant change in the protein level of DCPs. Our results suggest that under abiotic stress conditions, the resistant genes differentially express independent of the decapping event.

Keywords: Pathogen-associated molecular patterns, PAMP-triggered immunity, effector triggered immunity, resistant genes, abiotic, decapping

Introduction

Plant immune response activation is based on precise recognition between a plant receptor and a cognate pathogen effector, famously described as gene-for-gene relationship among plant host disease resistant genotypes and avirulent pathogenic strains (Flor, 1971). Overall, the plant immune system executes its role via two distinct arms, namely, pattern triggered immunity (PTI) and effector triggered immunity (ETI) (Panigrahi and Satapathy 2020a). Plant immunity, as a counter-attack against microbial infection, is exquisitely controlled by two different immune receptors known as extracellular immune receptors (pattern recognition receptors, PRRs) and intracellular immune receptors [resistance (R) proteins,