

Functional analysis of a TGA factor-binding site located in the promoter region controlling salicylic acid-induced *NIMIN-1* expression in *Arabidopsis*

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ABSTRACT. TGA factors play a key role in plant defense by binding to the promoter region of defense genes, inducing expression. Salicylic acid (SA) induces the expression of the gene encoding NIMIN-1, which interacts with NPR1/NIM1, a key regulator of systemic acquired resistance. We investigated whether the TGA2-binding motif TGACG located upstream of the *NIMIN-1* gene is necessary for SA induction of *NIMIN-1* expression. A mutated version of the *NIMIN-1* promoter was created by site-directed mutagenesis. We generated T-DNA constructs in which native *NIMIN-1* and mutated promoters were fused to green fluorescent protein and β -glucuronidase reporters. We produced transgenic *Arabidopsis* plants and observed *NIMIN-1* promoter-driven green fluorescent protein expression in the roots, petiole and leaves. Constructs were agroinfiltrated into the leaves for transient quantitative assays of gene expression. Using quantitative real-time RT-PCR, we characterized the normal gene response to SA and compared it to the response of the mutant version of the *NIMIN-1* promoter. Both the native *NIMIN-1* construct and an endogenous copy of *NIMIN-1* were induced by SA. However, the mutated promoter construct was much less sensitive to SA than the native *NIMIN-1* promoter, indicating that

this TGA2-binding motif is directly involved in the modulation of SA-induced *NIMIN-1* expression in *Arabidopsis*.

Key words: NIMIN-1; TGA; Defense; Salicylic acid; *Arabidopsis*; Transient assays