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Overexpression of the AP2/EREBP transcription factor OPBP1 enhances disease resistance and salt tolerance in tobacco.

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Abstract

Osmotin promoter binding protein 1 (OPBP1), an AP2/EREBP-like transcription factor of tobacco (*Nicotiana tabacum*), was isolated using a yeast one-hybrid system. RNA gel blot analysis indicated that expression of the OPBP1 gene was induced by elicitor cryptogein, NaCl, ethephon, methyl jasmonate, as well as cycloheximide. Transient expression analysis using an OPBP1-eGFP fusion gene in onion epidermal cells revealed that the OPBP1 protein was targeted to the nuclear. Further, electrophoretic mobility shift assays demonstrated that the recombinant OPBP1 protein could bind to an oligonucleotide containing the GCC-box cis element. Transgenic tobacco plants with an over expression of the OPBP1 gene accumulated high levels of PR-1a and PR-5d genes and exhibited enhanced resistance to infection by *Pseudomonas syringae* pv *tabaci* and *Phytophthora parasitica* var *nicotianae* pathogens. They also exhibited increased tolerance to salt stress. These results suggest that OPBP1 might be a transcriptional regulator capable of regulating expression in sets of stress-related genes.

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