Public Abstract
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Title:CHARACTERIZATION OF A SOYBEAN BAG GENE AND ITS POTENTIAL ROLE IN NEMATODE RESISTANCE

The expansion of the soybean cyst nematode (SCN; Heterodera glycines) across soybean producing regions of the United States shows no signs of slowing. SCN is a microscopic parasitic roundworm of soybean that causes over 1 billion dollars in soybean yield loss annually in the United States alone. Plants resistant to the soybean cyst nematode (SCN) mount a hypersensitive cell death-like response upon nematode feeding, but the genes regulating this process are unknown. Laser-assisted microdissection of nematode feeding cells coupled with microarray analysis identified a soybean gene upregulated 87-fold in plants resistant to SCN that shared sequence similarity with the Arabidopsis BAG6 (Bcl-2 associated athanogene 6) gene. Members of the BAG protein family in multiple organisms have been shown to function in apoptosis to regulate a range of activities from inhibition to promotion of cell death. AtBAG6 was shown to induce programmed cell death in both yeast and Arabidopsis. Expression of a truncated version of the protein, spanning the calmodulin-binding, IQ domain and the BAG domain, enhanced the cell death phenotype. Here, we demonstrate that similar to AtBAG6, overexpression of the full length GmBAG6A protein or a truncated version spanning the IQ and BAG domains, induced cell death in yeast and plants, with the truncated form showing an enhanced cell death phenotype. Expression of the truncated form in Arabidopsis and soybean under the control of a nematode-inducible promoter significantly reduced nematode development demonstrating its potential use in engineering a novel form of nematode resistance in crop plants.