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Nematode secreted proteins originating from esophageal gland cells are injected through the stylet

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Nematode secreted proteins originating from esophageal gland cells are injected through the stylet directly into root tissues to facilitate plant parasitism. Secreted proteins are encoded by parasitism genes expressed in the nematode esophageal gland cells. The soybean cyst nematode (*Heterodera glycines*) Hg2DO1 gene is a candidate parasitism gene specifically expressed in the dorsal gland that encodes a 186 amino acid protein with a signal peptide. The Hg2DO1 sequence is classified as a “pioneer gene” with no homology to any other sequences present in current databases. We have determined the genomic structure of the Hg2DO1 gene and isolated both genomic DNA and corresponding cDNA sequences from the closely related nematode, *Heterodera schachtii*, for comparative analysis. Quantitative real-time PCR is underway to determine the developmental expression profile of the Hg2DO1 gene throughout nematode development. For functional analysis of Hg2DO1 both overexpression and RNAi constructs were generated and used to transform *Arabidopsis* and soybean hairy roots. These plants are being assessed for phenotypic changes and effects on parasitism. These studies are providing important insight into the mechanisms of nematode pathogenesis of plants.