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Co-regulation of the Glycine max soluble N-ethylmaleimide-sensitive fusion protein attachment protein receptor (SNARE)-containing regulon occurs during defense to a root pathogen

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Soybean cyst nematode (*Heterodera glycines*), a major pathogen of soybean (*Glycine max*) causes more production loss in soybean than all the other pathogens combined. Various breeding approaches have been conducted to combat this devastating pathogen, however the success is very low. We are conducting various molecular approaches to find actual cellular mechanism of host resistance. Closer study of infected cells in resistant variety *G. max* [Peking/PI548402] and susceptible variety G*. max* [Williams 82(PI518671)] through laser microdissection have resulted various unique genes present in *G. max* [Peking/PI548402]. Overexpression of these genes in susceptible cultivar G*. max* [Williams 82(PI518671)] have resulted resistance by inducing incompatible reaction and RNA interference of these genes in resistant genotypes resulted susceptible reaction, thereby inducing compatible reaction. In this approach, we have overexpressed the components of the Soluble N-ethylmaleimide-sensitive fusion (NSF) Attachment Protein (SNAP) REceptor (SNARE) complex that helps in docking of the vesicles to the membrane and subsequent release of the vesicular contents to the apoplast. There are many proteins that play important role in this process however, the core components of this study are syntaxin 121 (SYP121), Synaptosomal-associated protein 25 (SNAP-25), Synaptotagmin (SYT), Synaptobrevin (SYB), Secretion 1/mammalian uncoordinated-18 ([Sec1]/Munc18), and N-ethylmaleimide-sensitive fusion protein (NSF). Syntaxin 121, *Glycine max* homolog of *Saccharomyces cerevisiae* Suppressor of sec1 (SSO1) known as PENETRATION1 (PEN1) in *Arabidopsis thaliana,* function in resistance to *Heterodera glycines.* Co-expression of SYP121 with SNARE homologs results elevated transcripts in infected cells inducing resistance reaction.