

# **ROLE OF THE *Arabidopsis* PEPTIDE TRANSPORTER *AtOPT6* IN HEAVY METAL DETOXIFICATION AND PLANT-PATHOGEN INTERACTION**

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## **ABSTRACT**

*AtOPT6*, is a member of oligopeptide transport (*OPT*) gene family. In *Arabidopsis thaliana*, there are nine members in the *OPT* gene family that are thought to be involved in peptide transport. Spacial and temporal expression of *AtOPT6* correlates with transport of peptides in the major sink tissues indicating that this transporter may be involved in long distance transport of peptides to provide organic nitrogen to the developing plant organs. Over-expression of *AtOPT6* leads to cadmium hyper-sensitivity and higher accumulation of cadmium and phytochelatins in root tissues. *opt6* mutant plants exhibited less sensitivity to virulent pathogen *Pseudomonas syringae* pv *tomato* DC3000 and showed minimal chlorosis in leaves. The differential in bacterial growth in *opt6* mutant and wild-type plants was abolished when infected with *Pst* DC3000 COR- strain, indicating a possible role of *AtOPT6* in transport of bacterial phytotoxin coronatine. In addition, *opt6* mutant plants showed less susceptibility when infected with both cyst and root-knot nematode. Expression of *AtOPT6* increased during early stages of both cyst and root-knot nematode infection in and around the developing feeding sites. *AtOPT6* mediated transport of various *Arabidopsis* CLAVATA3/ESR-like (CLE-like) and nematode secreted peptides when expressed in *Xenopus*. Collectively, these data suggest that *AtOPT6* may transport nutrients into the feeding site or *AtOPT6* transports plant CLEs or nematode secreted peptides into the infected root cells to induce root differentiation.