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Ubiquitin Extension Protein, NtCdT24 Confers Cd Tolerance by Enhancing Proteasome Activity

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Objectives

To develop transgenic crops showing enhanced tolerance to heavy metals, we are studying the mechanism of metal tolerance in plants. We found that ubiquitination and proteasome activity are important for metal tolerance.

Materials and Methods

1. Materials

Plant – *Nicotiana tabacum*

Agrobacterium strain - LBA4404

Gene-*NtCdT24*

2. Methods:

Isolation of genes involved in metal tolerance using complementation of yeast mutant;

Tobacco transformation;

Measurement of total ubiquitination;

Proteasome assay

Results and Discussion

Ubiquitin-dependent protein degradation has important roles in maintaining cellular homeostasis removing abnormal proteins. Here we show that expression of *NtCdT24* was stimulated by cadmium and NtCdT24 protein is localized in nucleus. Also, over-expression of *NtCdT24* enhances Cd tolerance and the 26S proteasome activity under cadmium stress.

Taken together, we suggest that ubiquitin/26S proteasome pathway involving ubiquitin extension protein, NtCdT24 may be important for metal tolerance of plants by removing metal-induced denatured proteins.