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Antioxidative Activity of Mungbean (*Vigna radiate* L.)
MLT107 Encoding 2-Cys Prx

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We isolated low temperature inducible genes using suppression subtractive hybridization (SSH) method and were able to obtain to clone *MLT107* gene encoding peroxiredoxin and aminotransferase. The full-length cDNA of *MLT107* is 1,049 bp with an open reading frame (ORF) consisting of 261 amino acid (aa). Genomic southern blot confirmed that mungbean genome has two copies of *MLT107* gene. Northern blot analysis was also carried out for the gene expression during ABA, NaCl, drought, wounding and H₂O₂ stresses. The expression of *MLT107* gene significantly decreased by ABA, NaCl and drought stress, but wounding and H₂O₂ stress significantly induced *MLT107* gene expression. Especially, H₂O₂ strongly induced the *MLT107* gene expression. The expression of *MLT107* gene during low temperature stress started to increase in 3 h after treatment, and then slightly decreased and again increased at 24 h. Using GFP fusion vector, smGFP-*MLT107* was targeted both to mitochondria and chloroplast. However, it was mostly targeted to mitochondria and partially targeted to chloroplast. For the functional analysis of *MLT107*, *MLT107* recombinant protein was heterologously expressed in *E.coli*. The *MLT107* recombinant cells showed enhanced antioxidant activity compared to that of vector control cells.

Key words: Mungbean, 2-cys peroxiredoxin, oxidative stress, GFP

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The Role of Soybean (*Glycine max* L.) *LT182* Encoding
Asparaginase Induced by Low Temperature

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Among low-temperature-inducible cDNAs isolated by SSH method, *ASP182* showed high homology with genes encoding l-asparaginase. The full length cDNA of *ASP182* is 1,258 bp long and contains an open reading frame consisted of 326 amino acids. Genomic southern blot and FISH analysis confirmed that soybean genome carries two copies of *ASP182* genes. *ASP182* was transiently expressed at the early period of cold stress. Salt stress induced the expression of *ASP182*, but not ABA, MeJA, or heat shock treatment. A plasmid, pET-*ASP182*, was constructed to express the soybean asparaginase protein in *E. coli*. It revealed that the soybean asparaginase protein was functional in *E. coli*.

Key words: Soybean, asparaginase, low temperature, stress