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Functional Analysis of SLTI114 gene with Matrix Metalloproteinase Activity

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Matrix metalloproteinase proteins (MMPs) are involved in remodeling of plant extracellular matrix in association with plant growth, development, and possibly defense processes. A noble soybean (*Glycine max*) metalloprotein gene, *SLTI114* was identified. The complete cDNA sequence of *SLTI114* comprised 1,443 bp with a initiation codon at position 102 and a termination codon at position 1,259. The *SLTI114* sequence has an open reading frame of 1,179 nucleotides which encodes 43.2 kDa polypeptide consisting of 393 amino acid residues. The nascent SLTI114 polypeptide contained N-terminal signal peptide with a central hydrophobic core between amino acids Asp₂₉ and Ser₃₀, and predicted cleavage site between amino acids Asp₁₅₃ and Val₁₅₄. The deduced SLTI114 polypeptide is a pre-pro-enzyme that has all of the hallmark motif characteristics of matrix metalloproteinases. To confirm the expression of the *SLTI114* gene at the transcriptional level, Northern blot analysis was also carried out using the mRNA prepared from the soybean leaves exposed to various stresses and hormone. The expression of SLTI114 is induced by LT(5°C) at 24 hrs and ABA at 6 hrs. The highest induction of SLTI114 occurs by NaCl-treatment for 6 hrs.