03-1-07

A Novel Stress-inducible SOD Promoter from Cassava (*Manihot esculenta*)

Seung-Yong Shin[1,3], Sun-Hwa Ryu[1], Haeng-Soon Lee[2], Suk-Yoon Kwon[1], Soon-Tae Kwon[3], Sang-Soo Kwak[1]*

[1]*Laboratory of Environmental Biotechnology,*
[2]*Laboratory of Plant Cell Biotechnology, Korea Research Institute of Bioscience and Biotechnology, Daejeon 305-806, Korea;*
[3]*Department of Life Science and Natural Resources, Andong National University*

Objectives

Superoxide dismutase (SOD; superoxide:superoxide oxidoreductase, EC 1.15.1.1) plays a key role in the first front protection against oxidative stress. In the previous study, a cytosolic copper/zinc SOD cDNA (*mSOD1*) was cloned from cassava (*Manihot esculenta*) cell line to produce high yield of SOD and characterized in terms of environmental stress (You et al. 1996; Lee et al. 1999). In this study, we cloned a genomic SOD gene from cassava by chromosome walking and its promoter was characterized to obtain a novel stress-inducible promoter.

Materials and Methods

1. Materials: Cassava suspension cells
2. Methods: Chromosome walking, transient expression assay

Results and Discussion

An 2,656 bp SOD genomic DNA consist of 1,562 bp promoter, 3 exons (42 bp, 91 bp, and 49 bp) and 2 introns (821 bp, 86 bp) was obtained from cassava. Sequence analysis revealed that 1,562 bp MSOD1 promoter contained putative binding site for several transcription factors including LTRE, ABRE, HSE, ARFAT, and W-box. It had a very large first intron (821 bp) interrupting the 5' leader sequence as some SOD genes. In a transient expression assay using tobacco BY-2 protoplasts, 2,480 bp fragment containing promoter and first intron showed about 1.7 times higher activity than 1,562 bp fragment except first intron. These results indicate that the first intron in the 5' leader sequence is involved in the promoter activity. The further characterization of MSOD1 promoter is under study.

References

You SH et al. (1996) Korean J Plant Tissue Culture 23: 103-106
Lee HS et al. (1999) Molecular and General Genetics 262: 807-814

* Corresponding author: TEL: 42-860-4432, E-mail: sskwak@kribb.re.kr