P11

Functional Screening of Plant Cell Death Suppressors Using Yeast Genetic System

Shin Dong Jin, Moon Hae Joung, Baek Dong Won, Jin Yin hua and Yun Dae Jin

Department of Molecular Biology, Gyongsang National University, Gajwa-dong 900, Chinju, korea 660-701

Programmed cell death (PCD) in plants is the active process of cell death occurs during development and in response to environmental cues. However, little is unknown about the genes and molecular mechanisms regulating the PCD in plant cells. Recently, it has been demonstrated that expression of animal Bax, a death-promoting member of the Bcl-2 family proteins, in yeast and plant cells is lethal (1, 2). These results indicate that some processes of PCD in animal, yeast, and plant may be shared. To identify genes involved in Bax-induced cell death in plants, we transformed yeast cells expressing Bax with several plant cDNA libraries and we selected for cells surviving after induction of Bax. So far, we have identified more than 10 kinds of cell death suppressor genes and found that all of the genes did not interfere with the production of the Bax protein in yeast as determined by immunoblot analysis. Among these suppressors, one of the clones (PBI1, plant bax inhibitor 1) was plant ascorbate peroxidase homologue. The expression of PBI in yeast confers resistance to cell death induced by H_2O_2. In plants, the PBI gene expression is greatly enhanced by H_2O_2 and UV stressess. When compared with control plants, the transgenic tobacco plants expressing antisensense RNA for PBI showed increased susceptibily to H_2O_2 stress. These results suggest that Bax toxicity may be due, at least in part, to the generation of oxidative stress.