

DOE DE-FG02-99ER20330 Award: A Final Report

Susheng Gan

The objective of the project was to investigate the regulatory mechanisms of two senescence-specific genes called *SAG12* and *SAG13* in Arabidopsis. To study the controlling mechanisms underlying *SAG12* expression, we have identified six EMS-induced mutation lines in Arabidopsis that display altered *SAG12* expression. One of the mutations has been fine mapped to a 0.03cM region on Chromosome 1. Positional cloning of the gene is ongoing in the lab. During the study of the regulatory mechanisms of *SAG13*, we have discovered the first genetic insulator of plant origin. We have also discovered that a polar promoter can be bidirectionalized by fusing a minimum promoter at the 5' end of the promoter in opposite orientation so that one promoter can direct two genes, one on each end.

Publications acknowledging this grant support:

Xie, M., He, Y. and Gan, S. (2001) Bidirectionalization of polar promoters in plants. *Nature Biotechnology* 9: 677-679. (this grant as the primary source)

He, Y. and Gan, S. (2002) A gene encoding an acyl hydrolase is involved in leaf senescence in Arabidopsis. *Plant Cell* 14: 805-815. (this grant as secondary source)

Patents: this funding has resulted in the following two patents (one issued and the other pending)

Gan, S., Xie, M. and He, Y. (2002) Bidirectional promoters and methods related thereto. US PTO Number: 6,388,170B1 (issued on May 14, 2002).

Gan, S. and Xie, M. "Genetic insulator for preventing influence by another gene promoter." Patent application was filed to US PTO on October 20, 2000 (pending).

This report is for the duration of the time this project was at the University of KY
8/15/99 - 8/14/02

DOE Patent Clearance Granted

 11-20-03

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