

## E214

### The Gene Defective in Blue Fluorescent *Arabidopsis* Tryptophan Mutants.

임선희, 정현숙\*

조선대학교 자연과학대학 유전공학과

The *trp1* mutants of *Arabidopsis* are blue fluorescent. This is due to a defect in tryptophan biosynthesis that leads to an accumulation of anthranilate, a fluorescent intermediate in the tryptophan pathway. PAT1 is a single-copy gene that complements all of the visible phenotypes of the different *trp1* mutants. Experiments to determine the regulation of the PAT1 gene are in progress. The wild-type PAT1 promoter and several promoter deletions of PAT1 gene have been transformed into *Arabidopsis* tryptophan mutants. These constructs revealed the normal tissue-specific expression of PAT gene and might identify promoter elements that control this pattern. We have isolated the homozygous lines in T<sub>3</sub> transgenic plants. Finally, the potential of using PAT1 as a selectable marker or visible reporter of gene expression is being explored.

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### Phenolic Function upon Pollen Growth in *Arabidopsis thaliana*.

송규상\*, 표병식<sup>1</sup>, 정현숙\*

조선대학교 유전공학과, <sup>1</sup>동신대학교 식품영양학과

Destruction of the ozone layer is resulting in increased levels of UV-B (280-320nm) radiation. This presents a potential threat to living organisms. Fortunately, plants can protect themselves from UV-B injury. For instance, growth reduction, wall thickening, enhanced DNA repair, antioxidative capacities, and phenolic production are all possible forms of protection. Thousands of phenolic structures can be formed in higher plants. Flavonoid and sinapate ester deficient mutants were evaluated to determine if their involvement in pollen-pistil interactions could be the driving force that has created such diversity. We developed a solid pollen germination medium for this purpose. Flavonoids are known to bind to an auxin transport system, but did not mediate pollen tube growth in our initial experiments, perhaps because the concentration gradient wasn't sharp enough. Pistils of a sinapate ester deficient mutant had enhanced pollen tube growth suggesting that sinapate esters may be important in that the ratio of sinapate esters to flavonoids could mediate pollen tube growth rather than the concentration of individual components. The accumulation of sinapate esters relative to flavonoids will be evaluated upon wounding and pollination to determine if either treatment preferentially induced one over the other.