

SL201

Identification of a pollen S gene involved in self-incompatibility of *Petunia inflata*

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Flowering plants have evolved genetic mechanisms to prevent self-fertilization which occurs from the close proximity of male and female reproductive organs. One mechanism is self-incompatibility that allows a bisexual flower to circumvent the tendency for the self-fertilization. In the mechanism, the female reproductive organ, the pistil, distinguishes between self pollen and non-self pollen; self pollen is rejected, whereas non-self pollen is accepted for fertilization. In *Petunia inflata*, a gametophytic self-incompatible plants, discrimination of self and non-self pollen by the pistil is controlled by a single polymorphic locus, the S locus. It is known that the protein products of S alleles in the pistil are S rejection of self pollen. Yet, the male component in self-incompatibility interactions, the pollen S gene, has not been identified. In order to look for such male component, we have screened pollen genes that show polymorphism between S2S2 and S3S3 alleles of petunia. Using mRNA differential display system, a cDNA clone which is specific to S3S3 but not to S2S2 has been isolated. The gene designated as PA4 is expressed in the pollens from the both alleles. However, DNA blot analysis with the genomic DNAs isolated from S2S2 and S3S3 plants showed polymorphism between the two different alleles against the PA4 gene, suggesting that the gene is possibly linked to the S locus. Cosegregation analysis of the gene on the progeny from the cross between the S2S2 and the S3S3 plants indicates that the gene is indeed linked to the pistil S locus. The possible nature of the pollen gene product and the possible mechanism by which allele-specific rejection of pollen is accomplished are discussed.