

Identification of *Arabidopsis thaliana* Mutants Deficient in Pollen and Embryo Development



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Introduction & Background

The small RNA processor (SRP) gene, only identified in metazoans until now, has recently been found in plants.

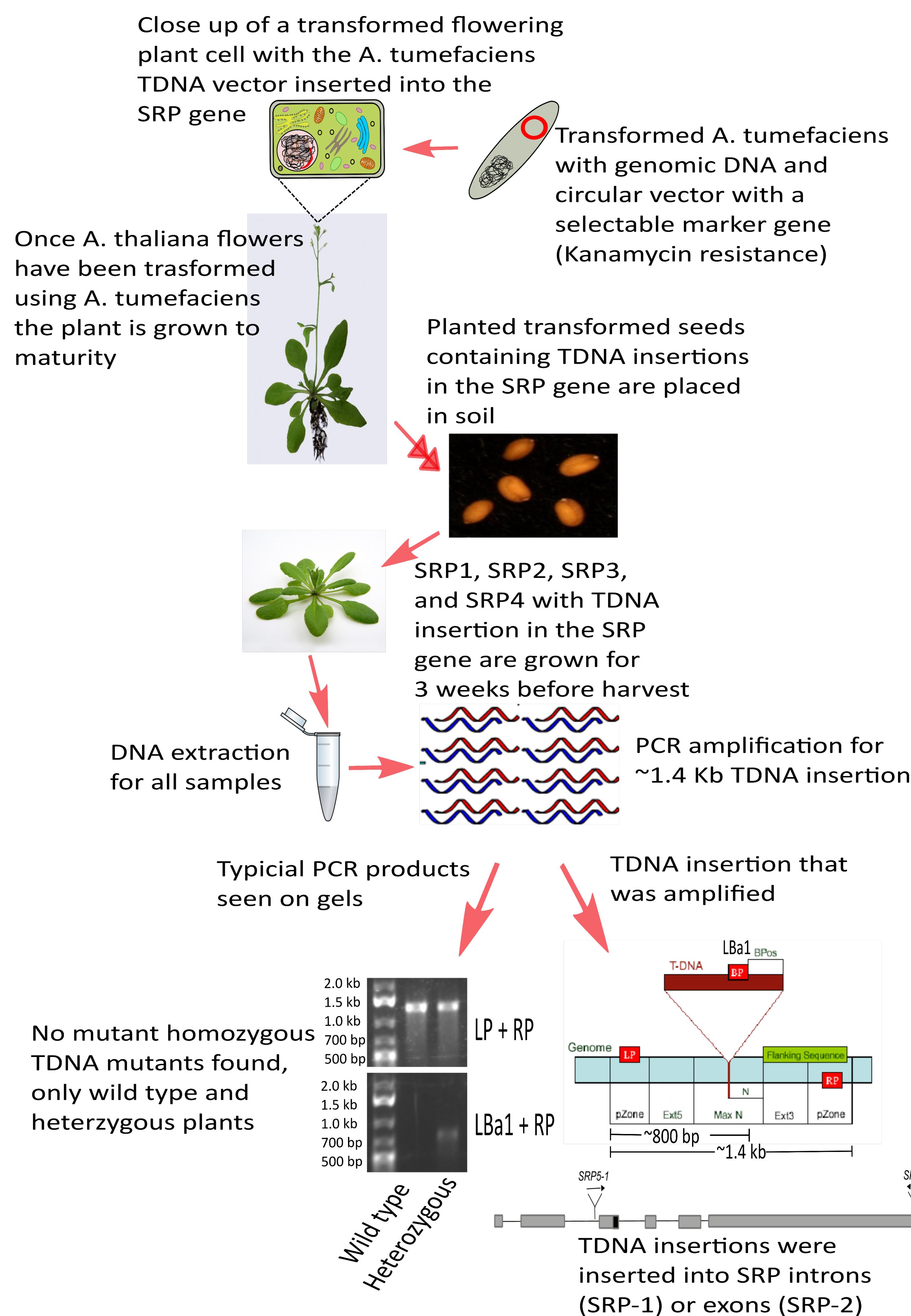
Previous studies have shown that SRP plays a critical role in the transcription and processing of:

- Uracil rich small nuclear RNAs
- Spliceosomal RNAs
- Enhancer RNAs

Because the function of SRP in plants is unknown, this study aims to find what insertional mutagenesis by *Agrobacterium tumefaciens* into the SRP gene does to *Arabidopsis thaliana*.

Results could potentially shed light on the evolutionary conserved gene function in plants.

Methods



Results

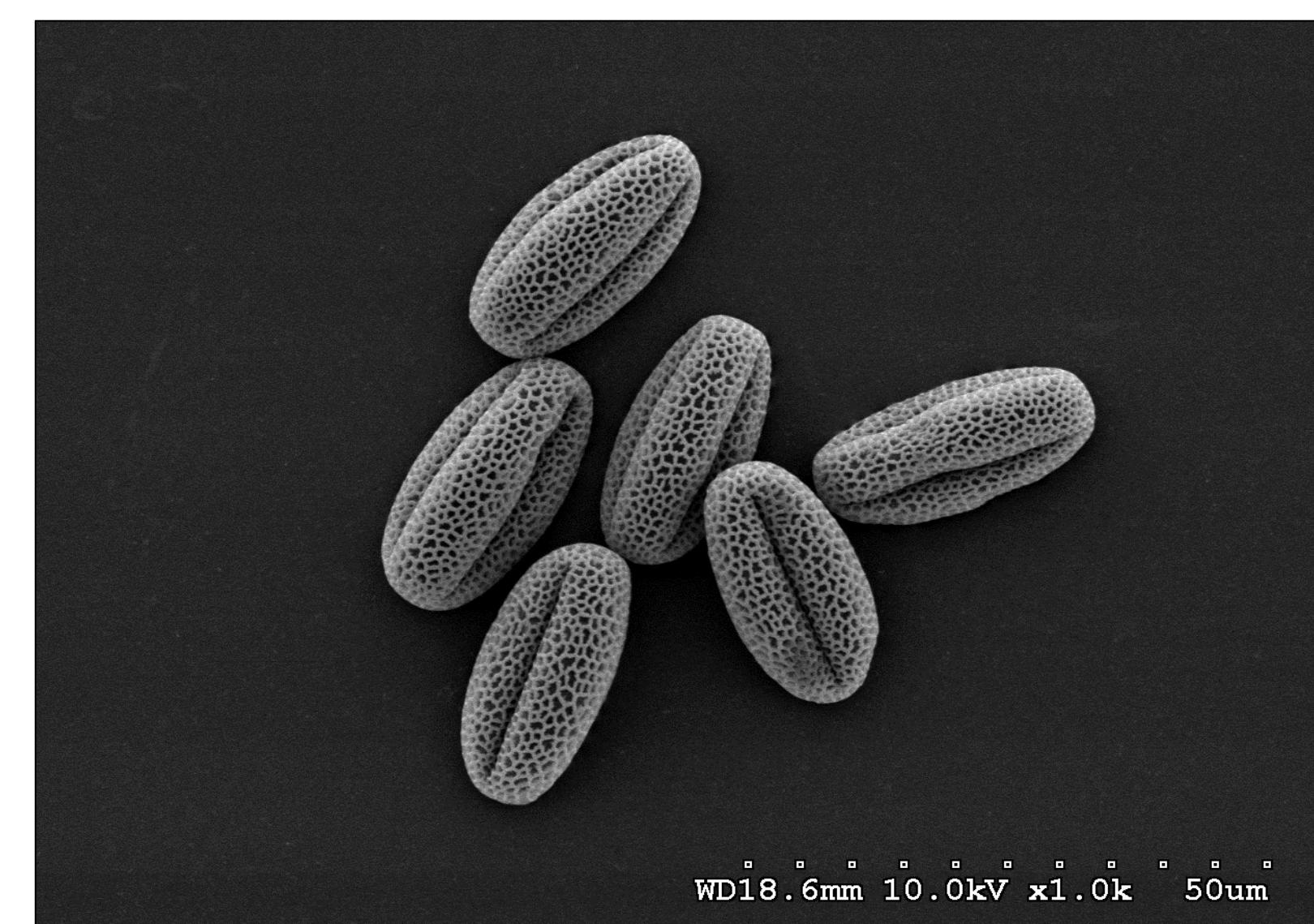


Figure 1: Wild type (Col) pollen under SEM



Figure 2: Deformed homozygous *srp5-1* mutant pollen under SEM

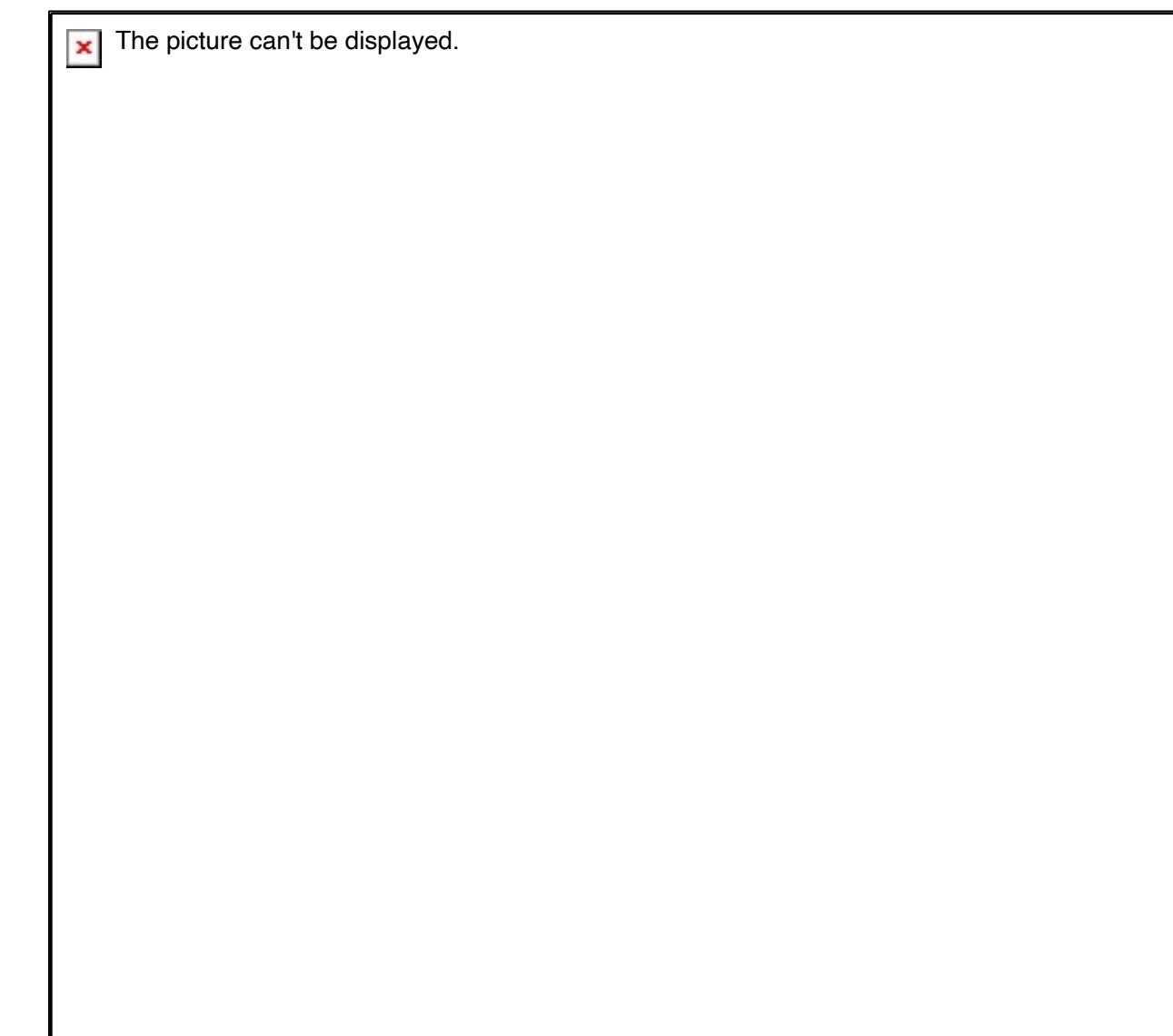


Figure 3: Wild type homozygous (Col) pollen stained with Alexander's stain, pollen is alive



Figure 4: Mutant heterozygous *SRP5-2* pollen under light microscope, alive and dead pollen observed

Sample ID	Wild Type Homozygous	Heterozygous	Total Plants	Genotypic Ratio
SRP1-2	23	22	45	1 : 1
SRP2-2	27	25	52	1 : 1
SRP3-2	10	29	39	1 : 3
SRP4-2	17	32	49	1 : 2
SRP5-1	15	29	44	1 : 2

Table 1: Summary of PCR results showing the number of wild type and heterozygous plants that contain the TDNA insertion in the SRP gene. No homozygous mutants were found.

Discussion & Conclusion

Our results show that:

- Only heterozygous and wild type plants were alive
- Mutant pollen was deformed or non-viable when compared to wild type pollen
- Homozygous mutant plants possibly not found because SRP mutation caused pistil, stamen death, or embryo death
- Future work: back crossing mutant and wild type pistils and stamens in attempt to determine whether pistil, stamen, or embryo death is creating the heterozygous and WT mutants observed