

P007 Arabidopsis XRN4 degrades aberrant RNA that initiates post-transcriptional gene silencing

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The *SHOOT MERISTEMLESS (STM)* gene controls shoot meristem development in Arabidopsis. The meristem-specific expression of *STM* is controlled transcriptionally and post-transcriptionally (efficient translation of the *STM* mRNA requires *PINHEAD* and *ARGONAUTE*). Aiming to understand the regulation and downstream targets of *STM*, we isolated mutants that suppress the phenotype caused by ectopic expression of *STM*. We found two alleles of a mutant that caused post-transcriptional silencing of the *STM*-expressing transgene. Silencing required the RNA-dependent RNA polymerase, SDE1, and appeared to be specific for transgenic lines expressing *STM*. Positional cloning showed that the mutated gene was *XRN4*, which encodes a cytoplasmic 5'-3' exonuclease implicated in mRNA degradation. In *xrn4, sde1* double mutants, but not in *sde1* controls, we detected accumulation of de-capped *STM* mRNA. Our results suggest that ectopic *STM* mRNA is targeted for XRN4-dependent degradation, and that de-capped, full-length mRNA can function as the template to initiate SDE1-dependent post-transcriptional gene silencing.