

Genome-wide non-mendelian inheritance of extra-genomic information in *Arabidopsis*



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A fundamental tenet of classical mendelian genetics is that allelic information is stably inherited from one generation to the next, resulting in predictable segregation patterns of differing alleles¹. Although several exceptions to this principle are known, all represent specialized cases that are mechanistically restricted to either a limited set of specific genes (for example mating type conversion in yeast²) or specific types of alleles (for example alleles containing transposons³ or repeated sequences⁴). Here we show that *Arabidopsis* plants homozygous for recessive mutant alleles of the organ fusion gene *HOTHEAD*⁵ (*HTH*) can inherit allele-specific DNA sequence information that was not present in the chromosomal genome of

their parents but was present in previous generations. This previously undescribed process is shown to occur at all DNA sequence polymorphisms examined and therefore seems to be a general mechanism for extra-genomic inheritance of DNA sequence information. We postulate that these genetic restoration events are the result of a template-directed process that makes use of an ancestral RNA-sequence cache.

<http://www.nature.com/nature/journal/v434/n7032/abs/nature03380.html>