

CRISPR/CAS MEDIATED CHROMOSOME REARRANGEMENT IN A WILD TOMATO GENOME

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The CRISPR-Cas system has been shown to enable not only gene editing, but also chromosome engineering. The generation of heritable chromosomal inversion by inducing targeted double strand-breaks is useful for breeders to reverse naturally occurring chromosomal rearrangement or induce new ones to stabilize or break trait linkages. In our study we aim to invert a 12 Mb region of chromosome 1 (chr) of *Solanum pimpinellifolium* (SP), the wild progenitor of cultivated tomato (*Solanum lycopersicum*, SL) carrying beneficial alleles, as means to unlock new variability by changing crossover (CO) frequency and distribution. This genomic region is reported to be inverted between SP and the SL cultivar Heinz 1706. We confirmed the presence of the natural inversion on chr 1 of SP by bioinformatic, molecular and cytological analyses and started the experiments to induce the reversion of this region through CRISPR-Cas9 technology. A Heinz x SP F1 was obtained to analyze the behavior of chromosome 1 during meiosis and assess CO recombination in the F2 segregating population.