

**CHROMOSOME-SPECIFIC SNP KASP ASSAYS FOR ANALYZING TELOSOME TRANSMISSION  
AND INFLUENCE ON RATES AND DISTRIBUTIONS OF HOMOLOGOUS RECIPROCAL  
RECOMBINATION IN THE AD-GENOME COTTONS**

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**Abstract**

Recombination as a molecular process is immeasurably important in providing genetic variation and correct meiotic behavior of chromosomes, which is essential to fertility. Reciprocal homologous recombination is extensively used for gene mapping, and is especially effective in areas near the ends of chromosomes, where it most often occurs. DNA near the centromere is predominantly hetero-chromatinized, and occurs as part of visibly discernible peri-centromeric heterochromatin, which has lower gene density, high rates of repetitive elements, and very low rates of recombination. These regions are physically large, but are normally difficult to analyze using recombination-based processes. Were it possible to modify distributions and rates of homologous recombination, it would allow for the creation of new genotypic combinations, and thus opportunities for genetic improvement. We will report on the development of chromosome-specific single-nucleotide polymorphism (SNP) marker KASP assays for AD species *Gossypium hirsutum*, *G. barbadense*, *G. tomentosum* and *G. mustelinum*. We used these SNPs, cytogenetic stocks and these AD-species in an attempt to influence the rates and locations of recombination events along the chromosomes. We also explored the data to analyze the positions of breakpoints relative to the SNPs and rates of paternal transmission of "telosomes" (acrocentric chromosomes). Our approach might be leveraged to better characterize and manipulate the large blocks of peri-centromeric heterochromatin, facilitate cotton genome sequence assembly and enhance cotton breeding efforts.