

Summary of publications

1. Positional cloning of the Hybrid sterility 1 gene: fine genetic mapping and evaluation of two candidate genes

Hybrid sterility is one of the mechanisms of speciation. The Hybrid sterility 1 (*Hst1*) gene was the first mapped mammalian gene. The gene affects fertility of male hybrids between certain laboratory strains (such as C57Bl/10) and *Mus musculus musculus* mice by causing a breakdown of spermatogenesis at the stage of primary spermatocytes. In the process of positional cloning of the *Hst1* gene, we generated a contig of bacterial artificial chromosomes (BACs) and subsequently a low coverage sequence of the candidate region of the 129S1/SvImJ strain. New genetic markers narrowed down the *Hst1* region from 580 to 360 kilobases. The products of two genes from this region, TATA-binding protein (*Tbp*) and proteasome subunit beta 1 (*Psm1*), accumulate during spermatogenesis. The proteins have been described previously as having conserved C-terminal sequences and species-specific N-termini. We evaluated the candidacy of these genes for *Hst1* by allelic sequencing and by real-time reverse-transcription PCR of testicular mRNAs. The results suggest that neither the *Psm1* nor the *Tbp* gene cause hybrid sterility. The single nucleotide polymorphisms (SNPs) we have found, was used for the haplotype analysis of the *Hst1* region.