Telomeres & Telomerase
Poster

UbcD1 LINKS TELOMERE MAINTENANCE TO DSB REPAIR

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Recent findings have shown that in many organisms telomere maintenance relies on the action of gene products required for double strand break (DSB) repair. For example, the yeast Ku heterodimer, which is involved in nonhomologous end joining, moves from telomeres to the DSB upon induction of damage, suggesting a link between DNA repair and the telomeres. mammalian Ku also binds to telomeric sequences and prevents telomere-telomere fusions.

The *Drosophila* UbcD1 gene product is required for proper telomere behavior. Mutations at this locus cause frequent telomere-telomere attachments during both mitosis and male meiosis. To investigate the role of UbcD1 at chromosome ends, we asked (i) whether the telomere-specific Het-A and TART transposons are required for *UbcD1*-induced telomere attachments, and (ii) whether the *UbcD1* mutations play a role in the formation of X-ray-induced chromosome breaks. Our results indicate that terminally-deleted X chromosomes, devoid of the Het-A and TART sequences, are involved in *UbcD1*-induced telomere attachments with the same frequency as normal X chromosomes. In addition, the frequency of X-ray-induced chromosome breakage in *UbcD1* mutants is lower than that observed in wild type controls, suggesting that a link between telomere capping and DSB repair functions may also exist in *Drosophila*.

We have also investigate the role of *mus309*, the *Drosophila* homolog of yeast *Ku70*, in telomere maintenance. *mus309* homozygous mutants do not exhibit telomeric attachments and show a low frequency (6%) of spontaneous chromosome breakage. However, in *mus309 UbcD1* double mutants, the frequency of telomere attachments is 3-fold lower than in *UbcD1* single mutants. This suggests that *mus309*, like its' yeast homolog, plays a role in mediating telomeric associations during interphase.