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Identification of an X-ray induced deletion mutant flanked by direct repeats

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We have sequenced an alcohol dehydrogenase (ADH) null mutant of D. melanogaster (nLA252) that was recovered following x-irradiation of mature sperm (1). Genetic experiments showed that this allele is not a gross deletion of the Adh region (2). We found a 9bp deletion that leads to the in-frame loss of Arg-Thr-Thr (see figure). The deletion is flanked by two 5bp direct repeats. The association of short direct repeats with spontaneous lacI deletion mutants in E. coli (3) and with formaldehyde induced Adh deletion mutants in D. melanogaster (4) has been described. Such deletions may be mediated by secondary structures that are stabilized by inter- and/or intra-strand hydrogen bonds (3). We do not believe that the deletion is a cloning artifact for two reasons. First, no other changes are seen within the exons and introns. Second, subunit isoelectric focusing shows the loss of one basic residue (5). Mutant nLA248, also of this series, is a duplication (6).

184						190
Ile	Thr	Arg	Thr	Thr	Leu	Val

A T C A C C C[G C A C C A C C C] T G G T G

Legend: The direct repeats are underlined and the deleted region is enclosed with brackets. The amino acids are numbered with the initiating methionine as "zero".

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