Duplication Encyclopedia Article

Duplication

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Duplication

Duplication mutations result in the selective increase of genes within a localized region of a **chromosome**.

At the chromosomal level, duplication mutations are one of four structural alterations that occur during the duplication (**replication**) of chromosomes. Duplication mutations originate with a rupture or breakage of chromosomal continuity during the replication process. In a duplication, the segment may graft (insert) next to the original site or be grafted (inserted) at a distant site. Because duplications result in chromosomal alterations duplications can cause important and profound phenotypic changes.

Duplication mutations may be tandem or non-tandem, depending upon where the duplicated region lies relative to the position of the original copy of the duplicated region. When the duplicated region lies next to the original region the **mutation** is a tandem mutation. The order of the signets does not matter.

When the duplicated region is inserted at a site on the chromosome that is distant from the loci (location) of origin--or when the insertion site is on another chromosome--the mutation is a non-tandem duplication.

A number of factors are associated with and contribute to duplication mutations. Any chromosomal break, replication error, or abnormal **crossing over** during meiotic synapses may lead to duplication. When expressed, duplication mutations can lead to extreme phenotypes or otherwise alter **dominance relations** or genotype/phenotype relationships.