Translocation Encyclopedia Article

Translocation

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Translocation

In **genetics**, chromosomal translocation refers to type of interchange of **chromosome** pieces of **DNA** following breakage, in which segments are transferred between nonhomologous chromosomes. When this exchange occurs without a net loss or gain of genetic material, it is called a balanced, or reciprocal, translocation, and there is no phenotypic change in the individual. When the exchange results in a deletion or **duplication** of chromosomal material, in gametes or somatic cells, severe phenotypic changes may result.

With chromosomal translocations, there is a physical movement of genes located on one segment of DNA to another location (locus) on another chromosomal segment of DNA. Because translocations involve changes to genes the are also termed translocation mutations.

In **cell** biology, translocation is a term also used to describe the movement of proteins or other substances through membranes. Translocation is also said to occur at the level of the ribosome during **translation** (**protein synthesis**) and involves the step-by-step movement along **mRNA codons** as each codon is read to determine which **amino acid** to insert into the lengthening protein chain. At the site of translation a translocation is said to occur as the mRNA moves one codon at a time through the ribosome complex (i.e., through the A site).

The process of ribosomal translocation involves specialized **enzymes** termed translocase enzymes.

Unbalanced chromosomal translocations, where the deleted segment, fragment, of portion of a chromosome attaches to another chromosome are rare in humans.