Deletions Encyclopedia Article

Deletions

The following sections of this BookRags Literature Study Guide is offprint from Gale's For Students Series: Presenting Analysis, Context, and Criticism on Commonly Studied Works: Introduction, Author Biography, Plot Summary, Characters, Themes, Style, Historical Context, Critical Overview, Criticism and Critical Essays, Media Adaptations, Topics for Further Study, Compare & Contrast, What Do I Read Next?, For Further Study, and Sources.

(c)1998-2002; (c)2002 by Gale. Gale is an imprint of The Gale Group, Inc., a division of Thomson Learning, Inc. Gale and Design and Thomson Learning are trademarks used herein under license.

The following sections, if they exist, are offprint from Beacham's Encyclopedia of Popular Fiction: "Social Concerns", "Thematic Overview", "Techniques", "Literary Precedents", "Key Questions", "Related Titles", "Adaptations", "Related Web Sites". (c)1994-2005, by Walton Beacham.

The following sections, if they exist, are offprint from Beacham's Guide to Literature for Young Adults: "About the Author", "Overview", "Setting", "Literary Qualities", "Social Sensitivity", "Topics for Discussion", "Ideas for Reports and Papers". (c)1994-2005, by Walton Beacham.

All other sections in this Literature Study Guide are owned and copyrighted by BookRags, Inc.



Contents

Deletions Encyclopedia Article.....1

Contents.....2

Deletions.....3

Deletions

A deletion **mutation** is a chromosomal mutation that occurs with the loss of one or more base pairs from a sequence of base pairs that normally comprise a **gene** or segment of a **chromosome**. After a deletion mutation, a chromosome is considered genetically deficient and is often termed a deletion chromosome.

For example, if the base sequence of **DNA** nucleotides was ATCGAT (adenine-thymine-cytosine-guanine-adenine-thymine) and a single base deletion took place at the third position (i.e. a deletion of the **nucleotide** with a cytosine nitrogenous base) the sequence would then read ATGAT (adenine-thymine-guanine-adenine-thymine). In a similar manner, a chromosomal deletion may involve a segment of chromosome that carries many genes.

Because the genetic code contained in the base sequence ultimately codes for the sequence of amino acids in a protein, most deletions have an adverse impact on either the synthesis of the protein or on the functional ability of the protein produced.

The identification of deletion mutations is also important to the construction of deletion maps -- a form of **genetic mapping** that uses known deletion mutants to identify and characterize an unknown **point mutation**. Following the introduction of a known deletion mutation to DNA containing an unknown point mutation, the **recombination** between the normal and mutated chromosome is examined for evidence of recombination. If recombination is evident the point mutation must lie outside the deletion area.

It is possible for a large amount of DNA to be deleted without affecting normal gene function. As long as the deleted portions of the chromosome are essentially intergenic or contain non-essential genes.

Although deletions certainly arise form chromosomal breakage, deletions also arise from natural sources. Recombination between **repeated sequences** of DNA (especially those that exist in the same **cell** following **DNA replication** but before **cell division** may lead to deletion mutations. In such deletion mutations one of the daughter cells may end up with a deletion mutation and the other with both copies of the repeated sequence carried in tandem combination.

Deletion mutations that include essential genes are almost always profound (i.e., they are lethal or causes dramatic changes in phenotype. The loss of genetic material usually precludes normal genetic regulation and function. A deletion mutation will normally result in the inactivation of the gene affected.

Because there is an outright loss of genetic material with deletion mutations, normal **DNA repair** mechanisms are ineffective and the mutation becomes permanent (i.e., the mutation is incapable of reversion).