

Nucleotide Encyclopedia Article

Nucleotide

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

Nucleotide Encyclopedia Article.....	1
Contents.....	2
Nucleotide.....	3

Nucleotide

A nucleotide is a single chemical unit which, when bonded with other nucleotides, forms nucleic acids. Nucleic acids such as **deoxyribonucleic acid (DNA)** and **ribonucleic acid (RNA)** are the basis for all life on Earth.

Chemically, nucleotides are composed of three types of molecular groups including a sugar structure, a phosphate group, and a cyclic base. A sugar molecule is the primary structure for all nucleotides. In general, the sugars are composed of five carbon atoms with a number of hydroxyl (-OH) groups attached. The sugars differ depending on the type of nucleotide, and can be either D-ribose or 2-deoxy-D-ribose. When incorporated into a nucleotide, the sugar molecule exists in a closed ring structure.

A key part of a nucleotide is a heterocyclic base that is covalently bound to the sugar at its first carbon. These **bases** are either pyrimidine or purine groups, and they form the basis for the nucleic acid code. Two types of purine bases are found including adenine and guanine. In DNA, two types of pyrimidine bases are present, thymine, and cytosine. In RNA, the thymine base is absent and uracil is found instead.

A phosphate group makes up the final portion of a nucleotide. This group is derived from phosphoric acid and is covalently bonded to the sugar structure on the fifth carbon. Chemical linkages between nucleotides are made possible by the presence of the phosphate group. In a nucleic acid polymer, the phosphate group from one nucleotide is bonded to the third carbon on another nucleotide. Multiple bonds are made in this way creating a sequence of bases which become an organism's genetic code.