

Chromatin Encyclopedia Article

Chromatin

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

Chromatin Encyclopedia Article.....	1
Contents.....	2
Chromatin.....	3

Chromatin

Chromatin is a network of **deoxyribonucleic acid (DNA)** and nucleoproteins that constitutes a **chromosome**. Chromatin can only be found in a **cell** with a **nucleus**, and is therefore not present in a prokaryotic cell. The DNA within a eukaryotic cell can be as long as 4.7 in 9 (12 cm). Due to its length, the DNA must be arranged and organized in order to fit within the small area of a cell nucleus. To accomplish this task, the DNA is bound, through electrostatic forces, with nucleoproteins called histones and nonhistones. The assemblage of DNA with the nucleoproteins is called a nucleosome, which is the fundamental structural unit of chromatin and represents 1.8 turns of DNA wound around a core particle of another histone protein. It is the **nucleosomes**, along with the DNA material between nucleosomes (linker segment), that gives DNA the characteristic beads-on-a string appearance, with the nucleosomes representing the bead and the linker segment of DNA representing the string.

When chromatin is isolated, it appears to be composed as smooth fibers. While the highest level of chromatin organization is not well understood, scientists have found that chromatin fibers are divided into functional groups, called domains. The domains are grouped and arranged into loops called solenoids. In cells that are dividing, the solenoids are further condensed into chromatids; an identical pair of chromatids comprise the recognizable shape of a chromosome.

There are two types of chromatin: **heterochromatin** and **euchromatin**. Heterochromatin is chromatin in condensed form, is seen as dense patches and is transcriptionally inactive while euchromatin is seen as delicate, thread-like structures that are abundant in active **transcription** cells.

When early scientists began staining cells, they noticed that granular material within the nucleus could become brightly colored when stained with a basic dye. The colored granular structures were named chromatin, derived from the Greek word *khroma*, meaning color.