Prophage Encyclopedia Article

Prophage

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

Prophage Encyclopedia Article.....1

Contents.....2

Prophage.....3

Prophage

A prophage is the **DNA** of a **bacteriophage** that is incorporated into the **genome** of a host **cell** during the lysogenic cycle. A bacteriophage is a **virus** that is only able to infect and reproduce in **bacteria**. The prophage enables the bacteriophage to replicate its own DNA without disruption of the host cell's DNA. After **replication**, the virus is able to exit the bacterial **chromosome** and further infect other cells.

Viral replication can occur by one of two cycles: the lysogenic cycle or the lytic cycle. The lysogenic cycle reproduces viral DNA usually without harming the host bacterial cell. Viruses that reproduce via the lysogenic cycle are called temperate viruses. In the lysogenic cycle, the bacteriophage attaches to the outer surface of a bacterium and injects its DNA into the bacterial chromosome. The bacteriophage then circularizes and combines its DNA with the bacterial chromosome and becomes a noninfectious prophage. The cell's new DNA, a combination of the phage and the host cell's genome, replicates producing identical bacterial cells. The prophage continues to spread as the bacterium reproduces regularly through **cell division** without harming the host cell. Sometimes the viral DNA is excised from the bacterial DNA. When this happens, the viral DNA begins to replicate without being incorporated into the host cell's DNA. Eventually, the viral DNA is assembled into new bacteriophages and causes the cell to lyse, killing the host and releasing the new viruses.

The lytic life cycle is similar to the lysogenic cycle however it does not express a prophage. Instead of combining its DNA into the bacterial chromosome of the host cell to form a prophage, the virus shuts down the DNA of the host and orchestrates the production of its own genome. Viruses that are solely disposed to the lytic cycle are called virulent viruses. Unlike the lysogenic cycle, a bacteriophage that reproduces via the lytic cycle ultimately destroys the host bacterial cell. Although viral reproduction through the lytic cycle does not display a prophage, it is an important process in the production and spreading of viruses.