

Severo Ochoa Biography

Severo Ochoa

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

[Severo Ochoa Biography.....](#)1

[Contents.....](#)2

[Biography.....](#)3



Biography

Severo Ochoa is best known for being the first to synthesize **ribonucleic acid (RNA)** outside the **cell**. He has also discovered several important metabolic processes. For his work with RNA, he received the 1959 Nobel Prize in physiology or medicine, along with his colleague, American biochemist **Arthur Kornberg**.

Ochoa was born in Lueca, Spain, where his father was a lawyer, and graduated from the University of Malaga in 1921. He received a medical degree in 1928 from the University of Madrid. After further studies in experimental biology, in 1940 he joined the Medical School faculty of Washington University in St. Louis. In 1942, he moved to New York University's College of Medicine, becoming chairman of the biochemistry department in 1954. Ochoa became an American citizen in 1956.

Ochoa's synthesis in 1955 of RNA was pure serendipity--an unexpected byproduct of his study of the way cells use glucose that is stored as **ATP (adenosine triphosphate)**. Ochoa and a French associate, Marianne Grunberg--Manago, had purified an enzyme (now called polynucleotide phosphorylase) from the **bacteria** *Azotobacter vinelandii*. The two scientists were trying to study its reactions with ATP and other base-sugar combinations (called nucleosides) with one or three phosphate groups attached. No reaction occurred. However, when they added the enzyme and some magnesium to a nucleoside with two phosphate groups (diphosphate), over half of the nucleoside disappeared and some phosphorus was freed.

Ochoa traced the nucleoside to a new molecule that ultraviolet chromatography identified as a **nucleotide**. He then repeated the reaction with other nucleoside--diphosphates, in each case finding a nucleotide. Further analysis showed that the sugar was ribose, meaning that the reaction produced ribonucleic acid (RNA). Since the reaction was also reversible, Ochoa concluded that adding and removing phosphorus groups is a major mechanism in the synthesis and breakdown of nucleotide chains. Ochoa and other scientists used this method to decipher the genetic code. Later studies by others showed that RNA **polymerase**, instead of Ochoa's enzyme, is the main RNA synthesizing enzyme.

Ochoa is also known for his work on how the body uses carbon dioxide, and he helped identify a key compound in the metabolism of carbon dioxide. Ochoa also identified Krebs cycle reactions leading to energy storage in phosphate bonds.